Nokia
Mobile TV and video

IBC, September 2007

Multimedia

Watch New

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Mobile TV market potential

People who watch TV

- 1.1 B TV households in 2010 (3.3B people) (Informa Media Group)
- 295 M households with income >25k$/y in 2008 (EIU)

People who have mobile phones/devices

- 735 M mobile phones sold in 2005, 944 M in 2009 (Nokia)
- >50 M smart phones sold in 2005, >300 M by 2009 (Nokia)

By the **end of 2011 nearly half a billion people will be watching TV on their mobile phones**. Driven by the adoption of different mobile TV technologies (e.g. DVB-H), mobile TV will experience 50% year-on-year growth through 2010 (IMS Research 8/2006)

Infonetics Research (8/2006) estimates **revenue generated from mobile video services** around the world is set to leap from **$46.2 million in 2005 to $5.6 billion in 2009**.

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Holistic mobile video and TV experiences

Video on demand. Anywhere.

Subscribe to internet videos you love. Watch your favorite videos anywhere and anytime.

Video brought to you

Watch live TV

Browse and enjoy live internet TV services over cellular and Wi-Fi networks.

TV over web

Consume high-quality broadcast TV

Watch and interact with your favorite TV channels **in high quality** anywhere. You'll never miss an exciting match or an episode of your favorite TV series again.

Real TV. Real Time.

Take your videos with you.

Transcode and sideload your videos from PC to your Nokia Nseries device.

Media to go

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DVB-H is the leading global broadcast technology

DVB-H benefits:

- Globally standardized by ETSI as the standard for mobile TV in Europe and for US by TIA

- Based on the proven and global DVB-T digital TV standard

- There are over 60 companies supplying DVB-H technology
(e.g. http://www.dvb-h.org/products.htm)

- Low battery consumption

- High-quality video, QCIF/QVGA, 15-30 fps, 384 kbps

- High bandwidth capacity (up to 50 channels)

- Cost-efficient implementation, large SFN cells

- Thoroughly tested around the world

Forecast mobile broadcast service users by technology, millions

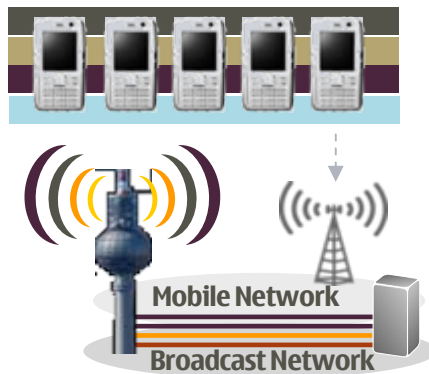**Worldwide broadcast mobile TV users by technology**
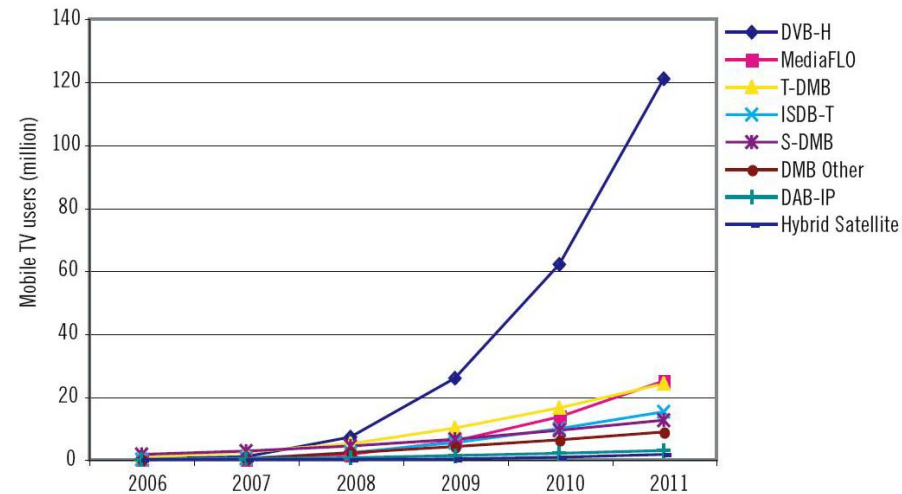
Source: INFORMA Mobile TV: Broadcast and Multimedia 2nd Edition 2006

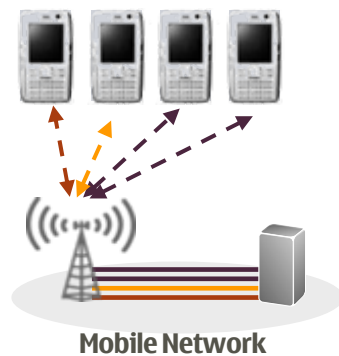# Complementary technologies for media delivery

- DVB-H is a complementary delivery technology in addition to 3G, MBMS and LTE
- The Mobile TV and video experience will be realized with a mix of several complementary technologies

Broadcast, DVB-H	Unicast, 3G, LTE	MBMS, 3G, LTE	IPTV, 3G, LTE

Mobile Network
Broadcast Network

Mobile Network

Mobile Network

Fixed Network

|			
• Mobile TV content to masses • > 20 channels nationwide • Interactivity via cellular • IP broadcast for filecasting	• Mobile TV content to communities • User-controlled personalized channels and interactivity • "Long tail" TV and video	• Multimedia services to masses and communities • Save 3G capacity for groups watching the same content	• Brings interactivity and personalized channels to fixed broadband TV at high resolution

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Create the most efficient Mobile TV channel mix: Broadcast for Top TV channels, Unicast for long tail

Relative usage

Top TV channels

High channel variety and user-controlled on-demand services
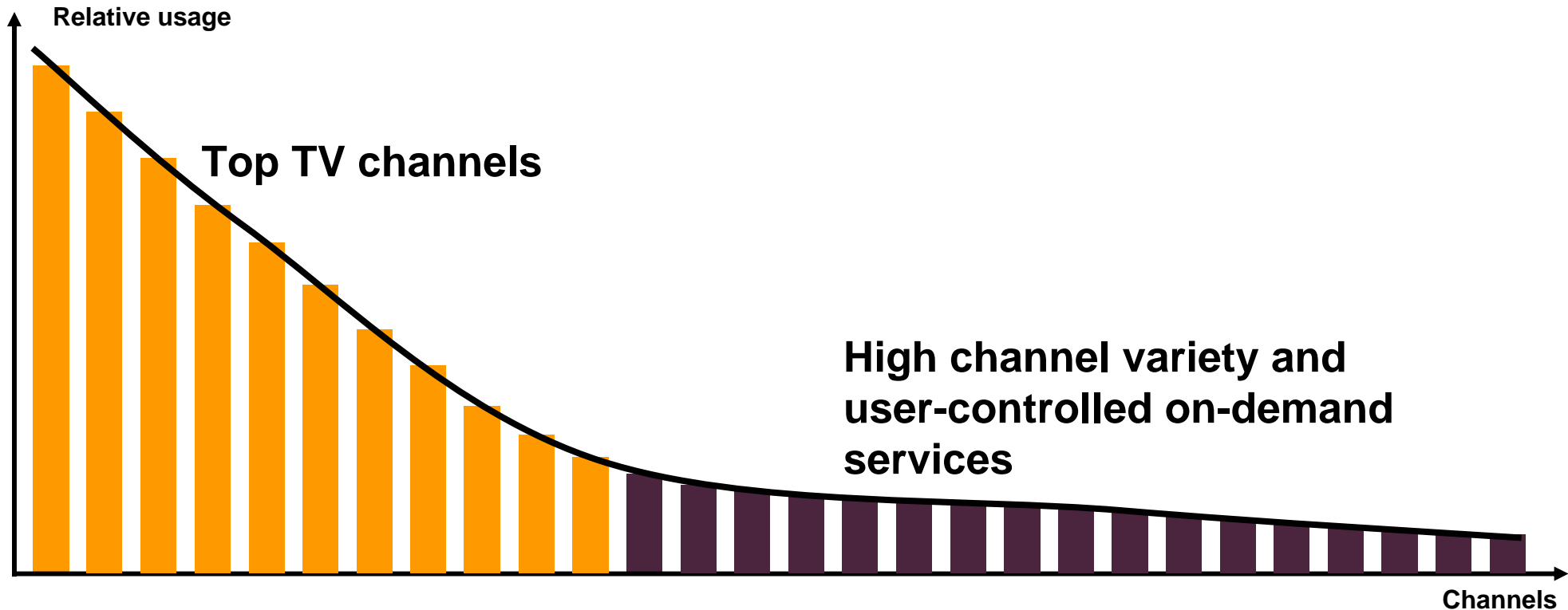
Channels

Top TV channels account for 80% of the usage
⇨ **Efficient broadcast**

User controlled personalized channels

⇨ **Point-to-point Unicast**

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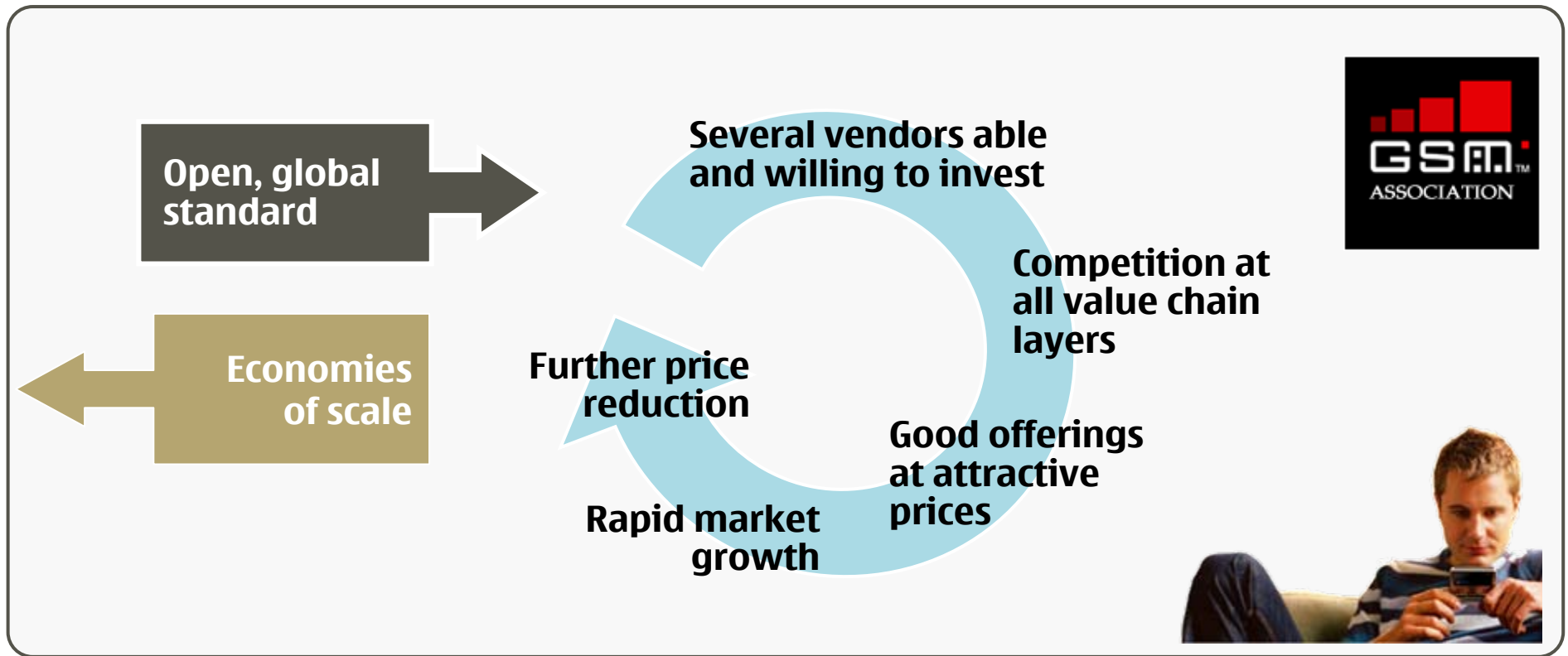# Mobile TV business opportunities

- Main business models:
  - Mobile operator-driven model
  - Broadcaster-driven model
  - Wholesaler model

Please visit http://www.mobiletv.nokia.com/news/events/mbr_video.php for an animation.

| Content providers | → | Mobile TV service provider | → | Mobile broadcast network | → | Mobile terminal |

Cellular network

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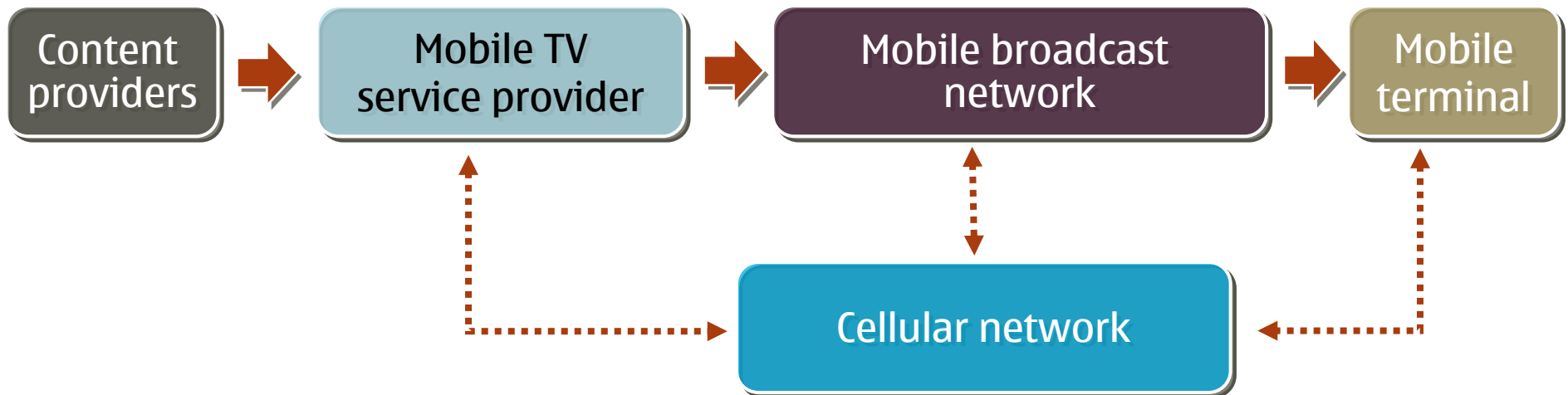
Open and competitive ecosystem for Mobile TV

Open, global standard

Several vendors able and willing to invest

Competition at all value chain layers

Economies of scale

Further price reduction

Good offerings at attractive prices

Rapid market growth

GSM ASSOCIATION

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DVB-H fundamentally changes mobile media delivery

Web   Call   SMS   Application   Video On Demand

Interactivity & transactions

Electronic Service Guide

TV/Video

Radio/Audio

Filecasting

Up to 50 TV channels, 100s of radio channels or **>100 gigabytes/day one-way data delivery** capacity with almost **zero marginal cost/user** enabled by Digital Rights Management (DRM)

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Mass market requirement: Flexible And future-proof service and content protection

- Mobile handsets must handle DRM for **all content types** over **all distribution methods**

	Live Streaming	On-demand downloads	Filecast	IPTV
DVB-H	◯ ●	◯	◯	◯
Cellular: GSM, EDGE, WCDMA,MBMS	◯	◯	◯	◯
WLAN	◯	◯	◯	◯
Memory cards	◯	◯	◯	◯
PC Synchronization	◯	◯	◯	◯

- Proprietary Conditional Access (CA) solutions (based on OSF) **originate** from **fixed broadcast networks** and support only live streaming over DVB-H
- They fail to meet the **general DRM needs** in mobile handsets
- NOTE: Each CA vendor has their **own proprietary implementation variation.**

Two open standards-based service and content protection methods for mobile devices:
1. OMA BCAST smart card profile
2. DVB IPDC 18Crypt, which is technically similar to OMA BCAST DRM profile (18Crypt)

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Nokia will follow the evolution of mainstream open standards

Nokia implements the **full OMA BCAST** environment:

- **OMA BCAST ESG** with **interactivity**
- **OMA BCAST DRM profile** implemented and commercially available in Q3/2007
- **OMA BCAST smart card profile** implemented and commercially available in Q2/2008

Nokia implements the **DVB IPDC** environment partially:

- **DVB IPDC ESG**
- **18Crypt** with OMA DRM 2.0 for service purchase and protection
- **Proprietary OSF framework will NOT be supported**

Nokia commitment:

- Nokia broadcast mobile TV implementations will **follow the industry mainstream** as long as this mainstream is based on open standards and a competitive implementations ecosystem
- Nokia will continuously publish descriptions of its broadcast mobile TV implementations at www.nokia.com/mobiletv

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Industry co-operation to ensure the adoption of open standards and interoperability

- Nokia is actively contributing to both **DVB-H IPDC** and **OMA BCAST** standardizations efforts

- Nokia is a member of the **BMCO Forum** and **Mobile DTV Alliance** in the US, two industry forums working on profiles for interoperability

- In **APAC**, Nokia is a member of **CASBAA**, Asia Broadcast Union **ABU** and **DAPA** (DVB-H Asia Pacific Alliance) to propagate and drive adoption of DBV-H mobile TV

Nokia has announced interoperability collaboration with Sony Ericsson, Motorola, and Samsung. This will ensure system compatibility with all the major handset vendors in the future.

100 members including key handset vendors and operators

bmcoforum
Broadcast_Mobile_Convergence

O2

LG
Life's Good

NOKIA
Connecting People

Sony Ericsson

MOTOROLA

vodafone

T··Mobile·

kpn

NEC

swisscom
broadcast

TeliaSonera

TIM   TELECOM ITALIA

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Full end-to-end delivery capability globally

Mobile TV and video solutions available globally

24/7 system support

Full end-to-end system supplier: DVB-H, 3G streaming, MBMS and LTE

Experienced also in network planning, implementation and integration

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Nokia Siemens Networks

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Nokia is fully committed to Mobile TV

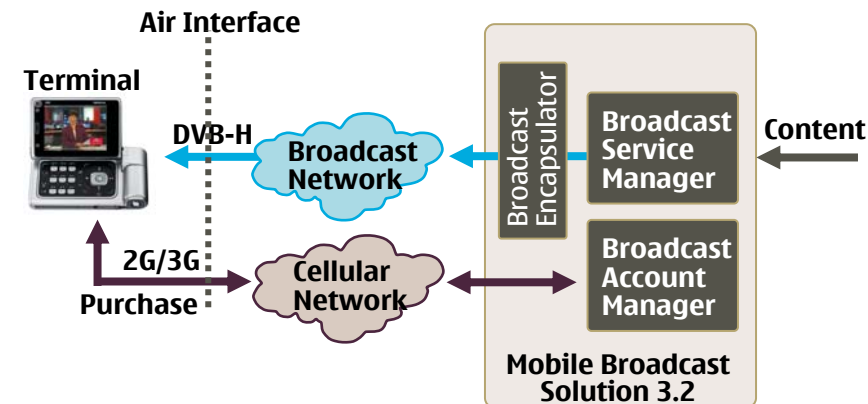Nokia is the pioneer of DVB-H

The first commercial implementations based on open standard service protection

Nokia Mobile Broadcast Solution 3.x, more than 20 pilots worldwide

Nokia will broaden its device portfolio

Nokia and Nokia Siemens Networks can offer the entire end-to-end mobile broadcast solution, including not only system solutions, but also network planning, implementation and integration

Nokia N92 and Nokia N77

Air Interface

Terminal

DVB-H

Broadcast Network

Broadcast Encapsulator

Broadcast Service Manager

Content

2G/3G

Purchase

Cellular Network

Broadcast Account Manager

Mobile Broadcast Solution 3.2

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Mobile TV
Global Status and Trend

More information on Mobile TV:
www.nokia.com/mobiletv

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See new. Hear new. Feel new.

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Media is going digital and mobile

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Three industry sectors relevant and contributing to the Video & TV user experience

"Mobile Video & TV"

Broadcast

DVB·H

YouTube™

• NOKIA

ovi

Internet

Telecom

Streaming
Casting

Streaming

Browsing

Downloading

Downloading

GSM   EDGE   WCDMA

Cellular   WLAN

WLAN etc.
PC and home connectivity

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DVB-H follows the success of GSM/WCDMA openness

Telephony

Fixed Telephone

Mobile phone

Global mass market & economies of scale enabled by open standards (GSM, WCDMA)

Broadcast TV

Fixed TV & Video

Mobile TV & Video

Global mass market & economies of scale enabled by open standards (DVB-H, OMA)

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DVB-H implementation globally

Legend:
- **Pilots**
- **Commercial**
- **Coming Launches**

Labels on map: Finland, Italy, India, Vietnam, Philippines, Malaysia

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Philippines – SMART – Mediaquest – 360me
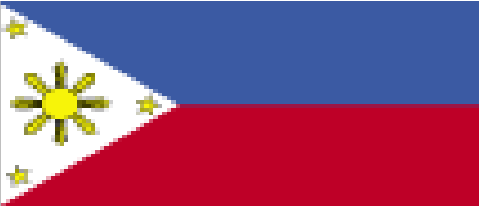
Unveiling the new face of Philippine TV

Digital television in the palm of your hands.

- SMART, the largest telecom operator in Philippines soft launched the Mobile TV services in Manila under the name

Upbeat pronouncements mark rollout of mobile TV in RP

- 11 Free-to-air channels to start with:

Cartoon Network, Basketball TV, PBA, MTV, CNN, Solar Sports, Jack TV, History Channel, Pinoy Box Office, National Geographic, ETC

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DVB-H and OMA BCAST is becoming the European choice
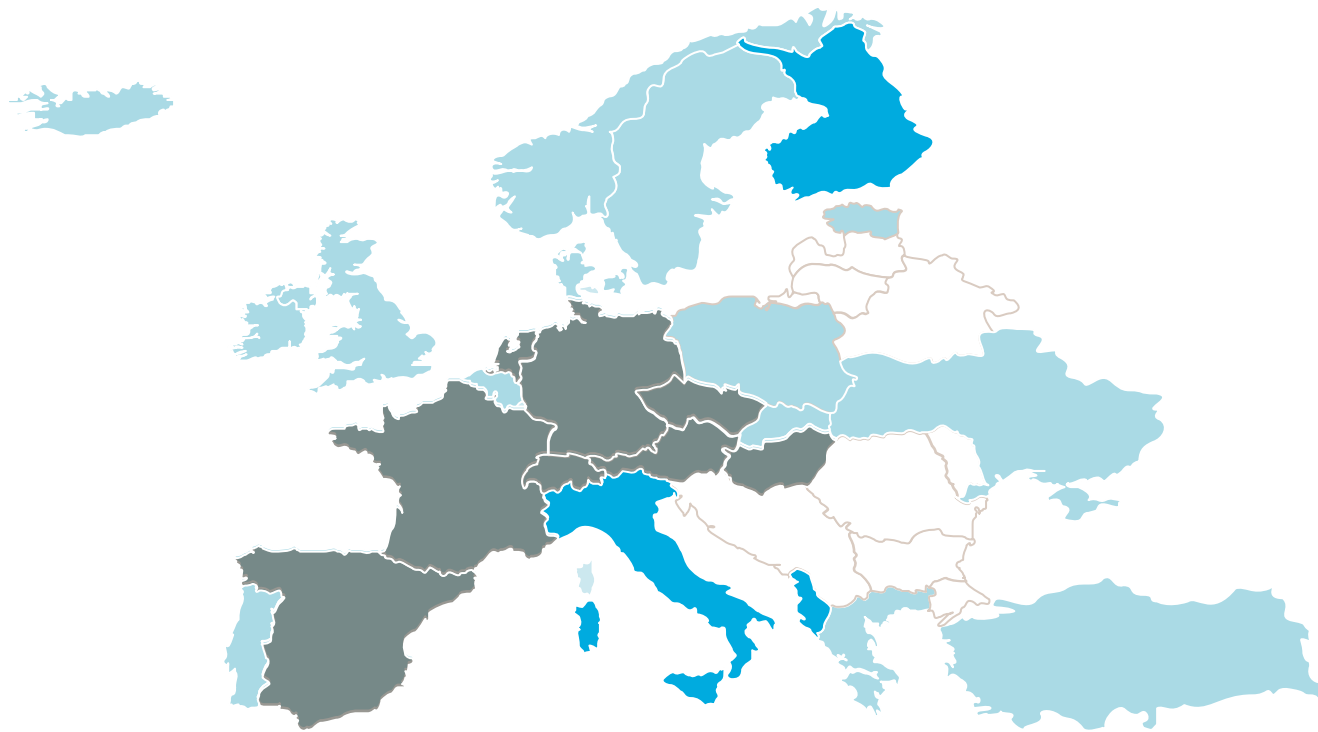
- **DVB-H commercial service**
- **DVB-H commercial service expected in 2008**
- **DVB-H trialed or planned to trial**

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H3G Italian DVB-H service, Walk TV, has been a success

Now >500k

Facts on H3G Italy DVB-H operations:

- Over 400k subscribers in 10 months (from total of less than 7M subscribers)

- H3G both as an DVB-H service and network operator

- 2000 towns covered, 75% of population (July 2006)

- 16 program channels, general interest and thematic (from H3G, RAI, Mediaset, SKY...)

CEO of H3G Italy:

- "We didn't expect the numbers to be this high''

- "We also didn't expect the strong growth trend to continue even after the World Cup"

- "Everybody has been saying that mobile television has been overhyped, but so far the vast majority of users have been satisfied with the service, and this bodes well for the future of mobile television."

Tariffs:

- Pay-as-you go:
  - 3€ / day
  - 12E / week
  - 29€ / month
  - 99€ / 6 m
- 49€/month, incl.:
  - All Mobile TV
  - 1h calls / day
  - 1GB of dls/m

Now 29€

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DVB-H activation trend - Benchmark
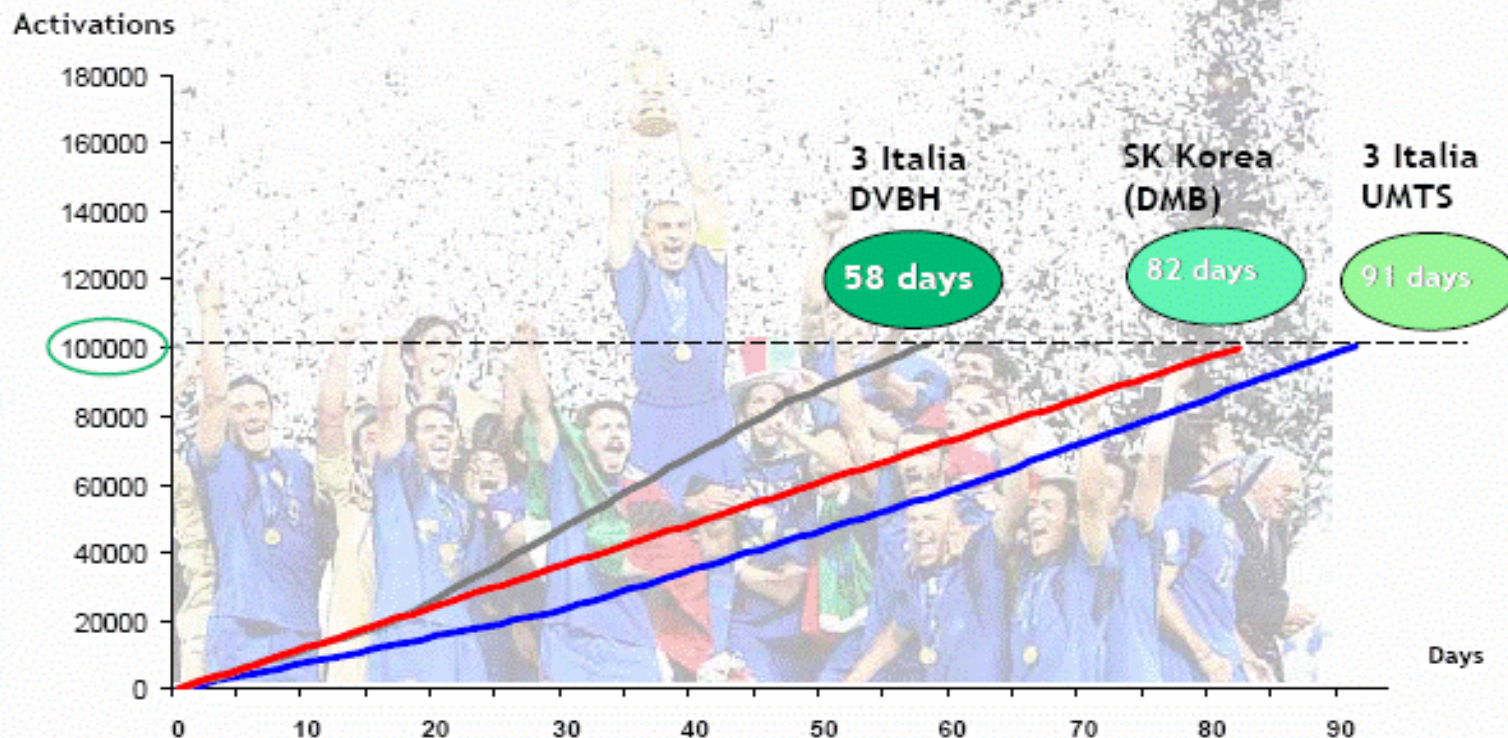
Now above 250K activations

12

Leading mobile companies to endorse common mobile TV implementation

April 12, 2007

- **Common implementation profile defined within the Broadcast Mobile Convergence Forum ensures service interoperability and economies of scale for Mobile TV devices**

- **Hague, the Netherlands:**
  Digitenne, Ericsson, KPN, Nokia, Nokia Siemens Networks, NXP Semiconductors, Sony Ericsson, Telefónica, O2 Europe, T-Mobile, Vodafone and ZTE today announced their support for a Mobile TV implementation profile developed within the Broadcast Mobile Convergence Forum (bmcoforum). The profile simplifies the Open Mobile Alliance (OMA) Mobile Broadcast Services Enabler Suite (BCAST) specification for fast implementations ensuring interoperability and future proofing further developments

April 16, 2007

Samsung and Nokia to Cooperate on Mobile TV Interoperability and engage in DVB-H enabled handset and network compatibility testing to accelerate time to market for broadcast mobile TV services

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Open standards boost market growth and reduce costs

- Ensures the best possible interoperability between the handsets and broadcast systems, providing customers with a smooth Mobile TV experience, and a similar open and competitive ecosystem that has lead to the huge success of GSM/WCDMA based mobile telephony

Open, global standard

Several vendors able and willing to invest

Value for money innovation

Wide range of offerings at attractive prices

Cost & price reductions as volumes grow

Marginal cost per device goes down as volumes grow (similarly as with FM radio, MP3 player)

Economics Of scale

Rapid market growth via wider addressable market

Competition at all value chain layers

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DVB H

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Nokia implementation for the OMA BCAST open standard

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As an open and mainstream standard, the OMA BCAST implementation profile boosts economies of scale

Open, global standard

Economies of scale

Several vendors able and willing to invest

Competition at all value chain layers

Good offerings at attractive prices

Rapid market growth

Further price reduction

GSM ASSOCIATION

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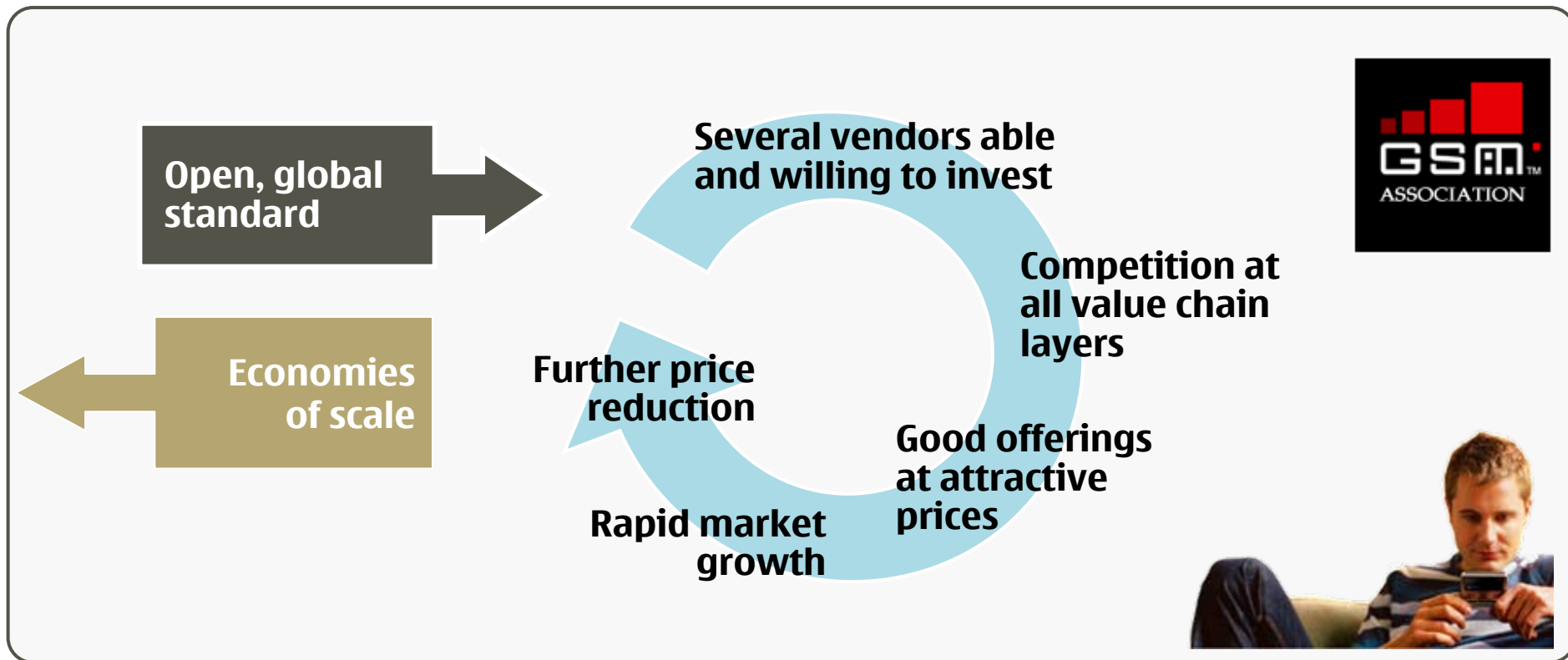
The **three main features** supported by the OMA BCAST standards

1. Advanced service and program guide (ESG) enabling a **rich set of services**

2. Support for **multiple broadcast technologies**

3. Support for content and service **protection**, using the **Smart Card Profile** (based on (U)SIM Card) or the **DRM Profile** (based on OMA DRM V2.0)

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Advanced service and program guide (ESG) enabling a rich set of services

Interactivity & transactions

Electronic Service Guide

TV/Video

Radio/Audio

Filecasting

Up to 50 TV channels, 100s of radio channels, >100 gigabytes/day or combination — enabled by Digital Rights Management (DRM)

A scalable, future-proof multimedia delivery platform

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Support for multiple broadcast and unicast technologies

Broadcast

WCDMA

MBMS

DV3H

Unicast

- Same Electronic Service Guide for broadcast and unicast-based multimedia services
- Easy service discovery

GSM **EDGE** **WCDMA**

Cellular   WLAN

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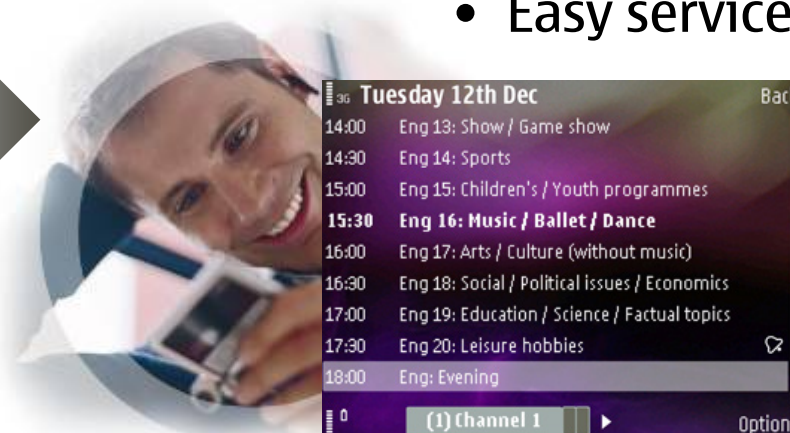
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OMA BCAST DRM profile with Nokia MBS 3.3

SRTP or ISMACryp (video/audio)

OAM DRM profile key stream

ESG (service discovery)

DRM key

Broadcast network

Purchase by OMA
BCAST DRM profile

Cellular network

Nokia Mobile Broadcast Solution

Broadcast Encapsulator

Encoder

Service key

Broadcast Service Manager

Sales item (SK)

Broadcast Account Manager
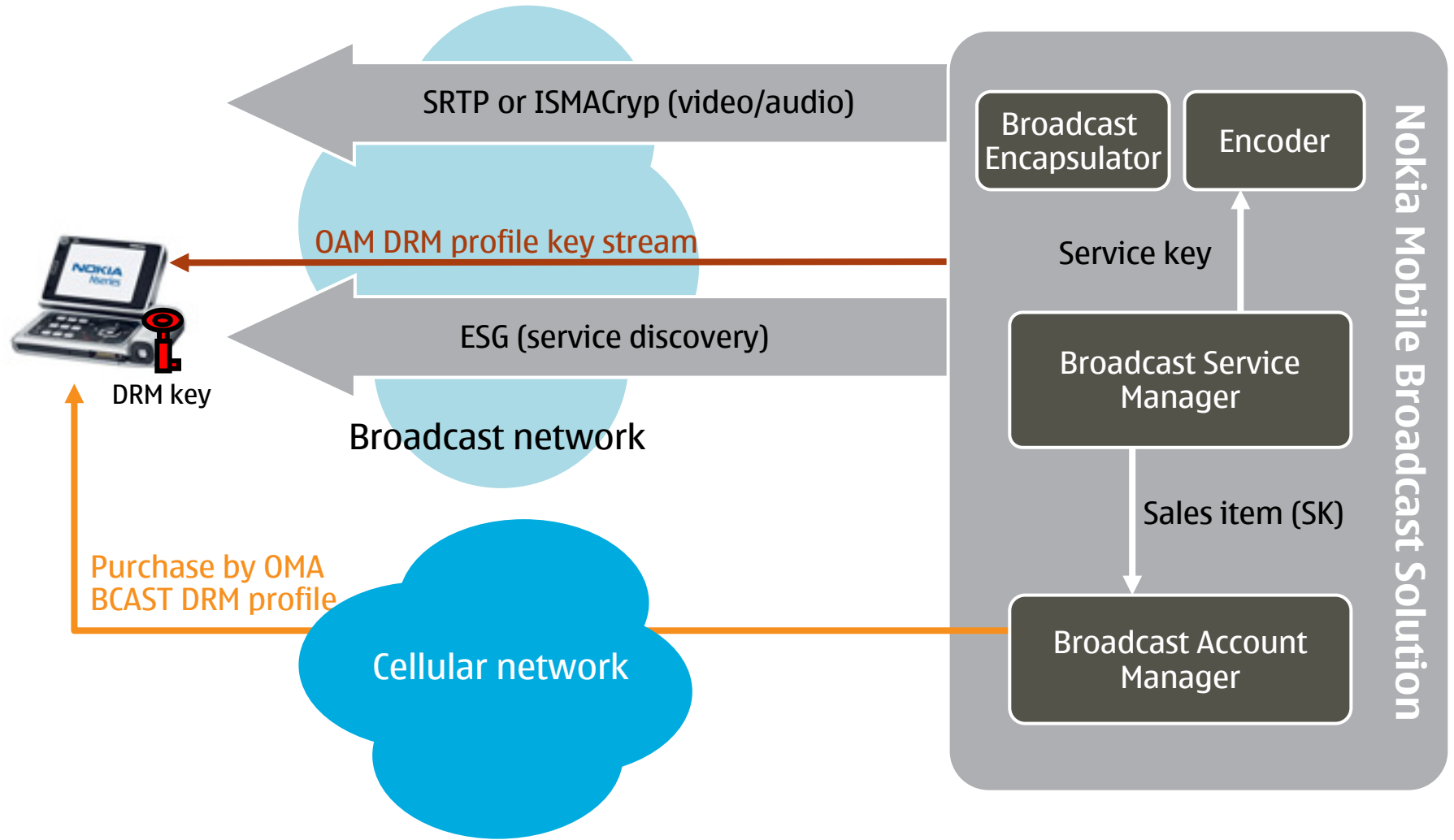
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OMA BCAST Smart Card Profile with Nokia MBS 3.3

USIM

SRTP or ISMACryp (video/audio)

OMA Smart Card Profile key stream

ESG (service discovery)

DRM key

Broadcast network

Cellular network

Purchase by OMA BCAST
Smart Card Profile

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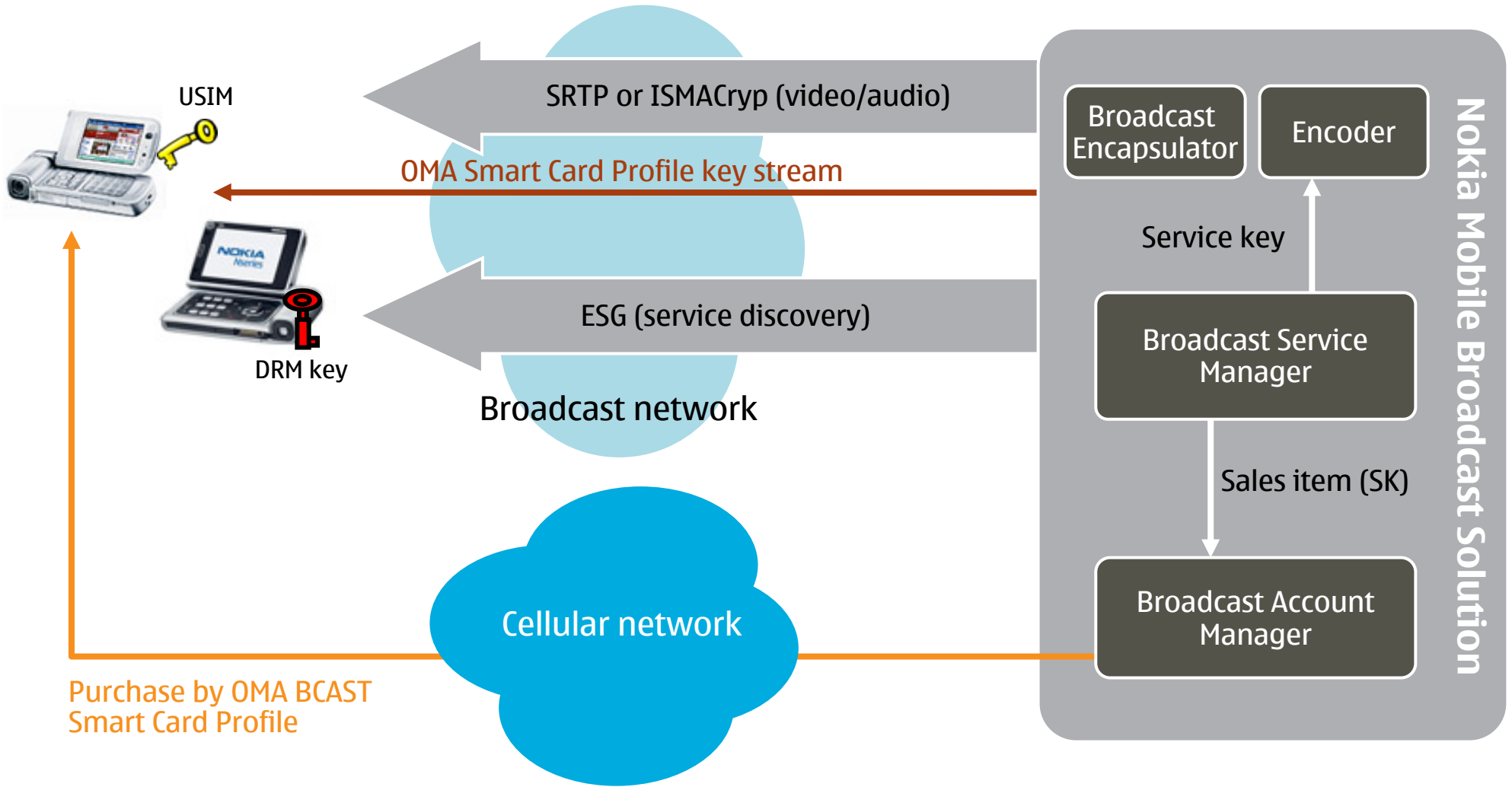
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OMA BCAST DRM and Smart Card Profile – dual implementation

USIM

OMA Smart Card Profile key stream

OAM DRM profile key stream

DRM key

SRTP or ISMACryp (video/audio)

ESG (service discovery)

Broadcast network

Purchase by OMA BCAST DRM profile

Cellular network

Purchase by OMA BCAST Smart Card Profile

Broadcast Encapsulator

Encoder

Service key

Broadcast Service Manager

Sales item (SK)

Broadcast Account Manager

Nokia Mobile Broadcast Solution

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OMA BCAST support with Nokia Mobile Broadcast Solution

	2H 2007	**1H 2008**
Service guide	OMA BCAST ESG for Service Discovery	OMA BCAST ESG for Service Discovery
Service purchase & protection	DRM Profile	DRM Profile
		Smart Card Profile (GBA/USIM)
	Available NOW	**Dual DRM & Smart Card implementation**

EURO 2008
Austria-Switzerland

Beijing 2008

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