

# SURPASS Home Entertainment White Paper



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# 1 Overview

## 1.1 Abstract

In the highly competitive telecommunication's market, value-adding services play a decisive role in business success: applications are increasing the customer loyalty and open up new sources of revenues. The benefits of broadband, combined with TV's easy of use, allow operators to tap into a market that has so far been limited to PC users. This is why broadband services are gaining acceptance in the living room. Operators are highly interested to enter this business to generate new revenue streams leveraging their existing infrastructure. New offerings will it make easy for users to enjoy both entertainment and communication services on TV. These simple-to-use services are available to any consumer who possesses television and DSL line, turning the television into a true entertainment and communication centre. Online games and video/audio on demand are offered, as well as easy-to use functions for recording TV programs (PVR) directly from an electronic program guide (EPG) such as viewing of "missed" programs, time-delay/time-shifted television. In addition video telephony, support of SMS, MMS and e-mail messages as well as Internet access via the TV set is made available. This paper aims to describe the environment operators have to face nowadays and how they can secure and extend their business in a changing market with the SURPASS Home Entertainment solution.

## 1.2 Operators Challenge

Telecom Operators around the world are facing the challenge of losing voice revenues due to major factors like the boom of Internet, increasing ILEC-CLEC competition and mobile communications. To make the life even more difficult, cable TV operators have started offering voice service to their traditional video customers and are thus entering into the domain of incumbent carriers. Studies have shown that end customers will pay for an attractive service bundle comprising voice, video and data and prefer to have a single bill from a trusted operator for all their service needs. Under these conditions, it has become mandatory for the incumbent Fixed Line carriers to reposition themselves in the changed competitive landscape. There is a strong need to migrate from simple infrastructure provider to one-stop service provider.

## 1.3 The Siemens Answer: SURPASS Home Entertainment

Siemens SURPASS Home Entertainment provides this basis for additional revenues through an attractive multimedia service bundle. Based on a modular concept the solution allows carriers to create a customized strategy for their entry into the multimedia business empowered by proven technology competence, best breed of technology partners and worldwide experience of service provider infrastructures.

## 2 Market Trends

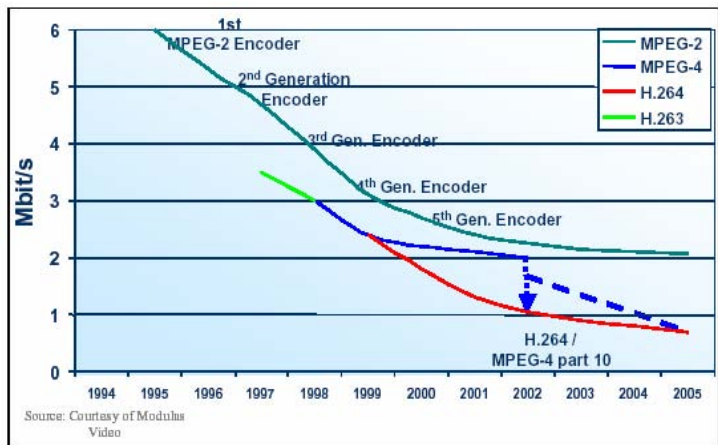
### 2.1 Filling the revenue gap with attractive applications

The global phenomenon of Internet growth and evolution of compression and broadband access technologies open opportunities to exploit and address new markets and numerous innovative digital services. With the emergence of Digital Television (DTV) and explosive growth of broadband access, capitalizing on these opportunities are enticing propositions. The SURPASS Home Entertainment solution helps operators to address this new consumer market with attractive services, filling the gap of shrinking margin in the traditional voice business. Commonly known as Triple Play services (voice, data and video), it consists of applications such as Video Broadcast, Video/Audio-on-Demand, Private Video Recorder (PVR), Video Telephony, Internet on TV, Walled Garden, Gaming, among others. The very distinct worlds of TV, global Web and telephony are now converging and creating unprecedented types of interactive communication and entertainment bundle.



Filling the revenue gap with attractive SURPASS Home Entertainment applications.

Technology evolution has also contributed significantly to the success of such solutions. The evolution for instance of the xDSL technology towards higher bandwidth (ADSL2+/VDSL) allows rich content and multimedia services to be delivered. Another contributing factor is improvement in compression technology MPEG-2 with advance coding can now produce “DVD like” pictures quality at low bitrates. The emergence of MPEG-4 is further strengthening this growth.



Improvements in the compression technology (source: Courtesy of Modulus Video).

There are many factors that are accelerating the demand and pushing the growth of SURPASS Home Entertainment applications:

- Competition from mobile/cable operators: Cable operators have started offering voice and Internet services, entering into the traditional carrier domain. Emerging 3G UMTS networks are offering multimedia applications.
- TV market penetration: reached close to 100% in all relevant countries
- Churns from existing subscribers: the way-out is to offer applications and thereby retain existing and acquire new customers
- Stagnant data revenue sources (flat rate paradigm): operator's data traffic skyrocket with the growth of the broadband access, but the revenues did not follow.
- Consumer expenses are driven by entertainment: most of the terminals today, like PDAs and Mobile phones, are shipped with integrated cameras, games, MP3 players.

**2.2 Market Environment & Potential**

The SURPASS Home Entertainment solution opens a new revenue source to fixed line operators which solves the flat rate data paradigm they are currently suffering. This enables them to counter the attacks they are experiencing on their core voice business by various new competitors. Consequently, most incumbents are already working on realizing such a concept.

The new business model for the carriers will evolve from the innovative value added multimedia services required by the end users. These services have to meet end user requirements for Triple Play i.e. the need to have voice, data and video services from the same operator. The success of service bundle can only be guaranteed if it is tailored according to the expectations of the end user.

A market research conducted by Siemens shows that the most important criteria for consumers to adopt new applications are attractive and competitive price models in comparison with today's expenses in entertainment. The top applications for consumers are Video on Demand and Video Telephony with "TV grade" ease of use & reliability like easy installation (plug&play) and operation without system crash or security issues.

The willingness to pay shows that consumers are willing to spend 30% on top of the current average monthly bill for a communication&entertainment bundle. In addition, the study clearly indicates that the most promising scenario is composed of a full service bundle at an attractive price, reaching the highest household penetration and therefore bringing more revenues to the operators.

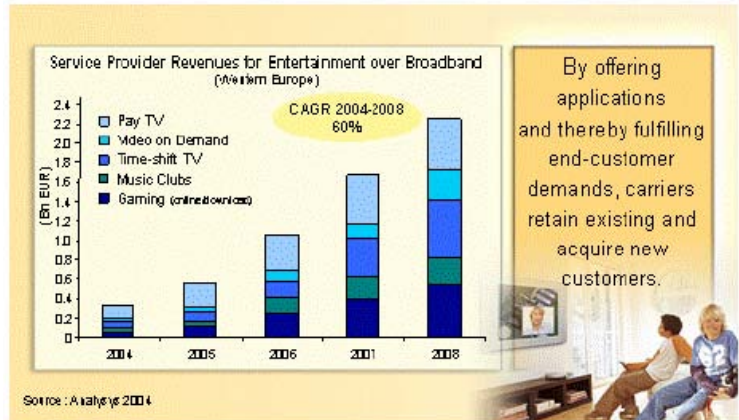
**An attractive and competitive price model is key for the consumer**

**In addition to attractive pricing, Video Telephony and Video on Demand have the highest influence on the attractiveness to your customers.**



Analysts expect that the number of worldwide Broadband Entertainment market will quadruple from 2005 to 2008.

**Consumers are ready for Home Entertainment applications**



Market potential - Entertainment over broadband market size

**2.3 Conclusion**

Today operators have to face different challenges like substitution to VoIP and mobile, decreasing customer loyalty, financial markets pressures, and disruptive technology trends. As a result, they are eager to adopt SURPASS Home Entertainment applications as a way to address this new consumer's market with attractive services. Time-to-market and the appropriate service bundle are key success factors. Even the operators are about to start in that market, operator managed home services will quickly evolve beyond SURPASS Home Entertainment, jumping over network boundaries and including Fixed Mobile Convergence and Smart Home services leading into "quadruple play" or "multiple play". Siemens has in-depth knowledge in these areas and is committed to take a leading position in developing this future market.

### 3 Benefits of SURPASS Home Entertainment

SURPASS Home Entertainment provides an attractive, easy and future-proof entry to the evolving market of operator managed home services

High revenue potential: Extensive consumer research done by Siemens, as well as first inmarket experiences of operators (e.g. Fastweb) prove that operator managed entertainment and communication services can yield attractive acceptance and ARPU levels with consumers. Operators can win in this new market and can build up a new basis for a sustainable future business

Best of breed solution: Siemens carefully selected partners with innovative and future proof technical concepts, partners that have already proven their performance with numerous customer references.

Ready for roll-out now, based on existing broadband access networks: Siemens not only selected the partners, but ensured proper and seamless inter-working between the components with own R&D efforts. We thus created a robust and reliable solution which is ready for roll-out now. Our solution is one of the very first building on the advanced H.264 coding standard, thus enabling entertainment delivery over installed ADSL networks with a bit-rate below 2Mbps

Easy entry: Siemens offers a wide range of integration and build services around SURPASS Home Entertainment. In fact, we offer to take end to end responsibility for installing & bringing the system up, thus offering an easy entry for operators to this new market

Future-proof: SURPASS Home Entertainment is pursuing an entirely open concept. Already now, we are building on open standards and systems like H.264, SIP and Linux. And we are actively working on establishing open standards in areas where they do not yet exist in this evolving market. These open standards will ensure maximum choice for operators not only on cost critical technical components like e.g. STB, but also on applications and services that are critical for consumer acceptance and ARPU.

Innovation Leadership: Siemens will lead innovation on the critical items network platform and consumer interface. We will provide the basis for successfully introducing a whole variety of services over a variety of access devices, with a simple and unified user experience for consumers and a modular network platform allowing for flexible service introduction and efficient management.

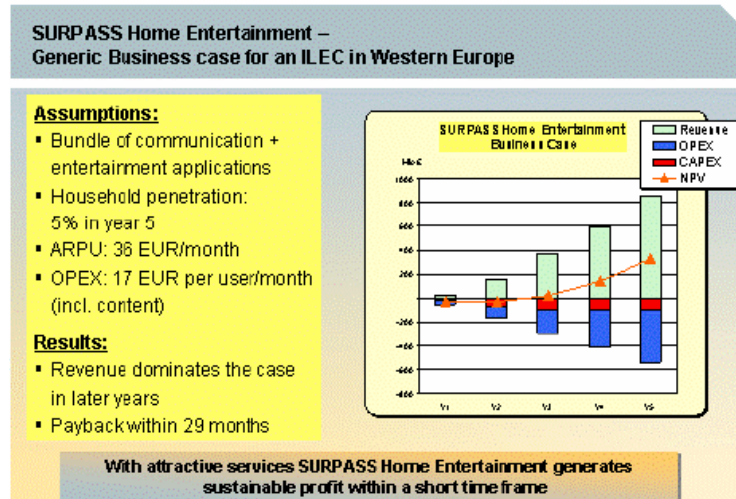
#### Unique selling point of SURPASS Home Entertainment

- The solution is world leading in implementing H.264 advanced low bit rate codecs. It is a reliable and stable solution that is ready for implementation already now
- Based on open standards and systems including best of breed partners
- Siemens capabilities delivering end-to-end carrier-grade solutions including system integration
- With its leading market positions in communications, fixed-mobile convergence, home networking (CPE, Fujitsu-Siemens), building technologies and automation (SBT, A&D, Osram), home appliances (BSH), health care solutions (MED), Siemens has the know how evolve the solution towards the full range of operator managed smart home services and is very determined to catch a leading position in the Smart home market.
- Siemens is a leading communications solutions supplier and not acting in competition with operators and service providers

## 4 Profitable business for operators

Carriers attempting to make broadband profitable by offering entertainment services – TV, music and games – are entering a well-established market. They have to choose the right partners (equipment vendors and content providers) and must get the pricing and the branding right. Their revenue share may not be huge, but this is a big and high-profile market that can contribute to the business case, and for many Telcos it is essential to target the entertainment market to secure their competitive position vis-à-vis new triple-play challengers. The following generic business case looks at operators (ILEC) rolling out new broadband networks and considering including entertainment in their proposition. Furthermore it is assumed, that the ILECs will invest in a high-capacity network and premium content offer aiming to capture every conceivable network-based revenue stream, including PayTV/Pay Per view (PPV), Video on Demand (VOD) and Time-Shift TV.

Nevertheless, by offering the right bundle to the market SURPASS Home Entertainment is the key for a new successful business, which generates sustainable profit within a short timeframe.



SURPASS Home Entertainment – Generic Business Case (ILEC)

## 5 Description of Services

The SURPASS Home Entertainment solution integrates the two different services, Communication and Entertainment, in a TV-like easy-to-use manner.

### 5.1 Entertainment services

#### 5.1.1 On-Demand Services

##### **Video (VoD), Audio (AoD)**

Video and audio on demand allows subscribers to select a video (eg. blockbusters) or a music clip from a list presented on their TV screens and watches it in real time streaming mode. The subscribers can perform all usual trick play actions (e.g. pause, fast forward, fast rewind) and stop.

##### **Yesterday's TV services**

Yesterday's TV allows a user to watch a TV program, which has been transmitted during the last days. The IPG/EPG data gives the user a friendly way to select the past TV programs that are available to be watched. The operators define which channels and programs will be recorded.

#### 5.1.2 Broadcast Services

##### **Broadcast TV**

The service allows subscribers to watch the current TV broadcast program in real-time streaming mode over broadband. Additional electronic program guide (EPG) data are sent to the STB. The electronic program guide in the back-office software application only contains the data of the pre-assigned parts of the TV program. Only those are selectable for the subscriber.

##### **Pay TV**

Can be referenced as a broadcasted TV channel where an extra fee is charged by the service provider, Pay-per-channel is nothing more than a subscription of a channel package on a flat rate billing basis.

##### **Pay per View (PPV)**

PPV operates like a broadcast TV channel and is available through the regular broadcast TV EPG/IPG. It is target to users who do not want to subscribe to a specific channel, but only to watch and pay select programs, e.g. TV show, special movie, sport event. Some features with PPV are program preview prior to purchase (not available for live events). All this requires the user authentication through PIN code introduction.

#### 5.1.3 Games

Games on TV service allows subscribers to select games from the IP network via the set-top box graphical user interface (GUI) and play them on their TV set. Via an unified resource locator (URL) the games located on servers in the IP network can be accessed. The URLs of the servers containing the games are administered in the back-office software application.

#### 5.1.4 Internet on TV

The Internet access is done through the television by using an integrated Web Browser customized for TV use. When using an optional keyboard subscribers can surf in the Internet in as similar fashion as if they were using a PC. Using the mentioned web-browser capabilities it is also possible for users to access an e-mail account, reading and writing mails via web mail server.

### 5.1.5 TV Web Portal - Walled Garden

For some specific content, operators can build TV-customized Web pages which are designed for optimal viewing on a TV screen and easy remote control navigation. Those dedicated pages are called Walled Garden. They are typically provided in the service provider's Intranet or Extranet.

### 5.1.6 Private Video Recorder PVR

PVR is an application that allows the user to select comfortably individual TV programs via the IPG/EPG menu, recording them in the content server located in the operator's network or on the local STB hard disk. After successfully recording the content, the user is informed via the IPG/EPG icon or a "recorded folder". Hence, the user is able to play and watch the content.

## 5.2 Communication services

### 5.2.1 Voice over IP

Via their set-top box subscribers can set up SIP based audio calls to and receive SIP based audio calls from another set-top box. The set-top boxes act as SIP clients.

### 5.2.2 Video Telephony

The Video Telephony service allows subscribers SIP/IP based video and voice communication via their living room TV set. Subscribers can use their standard analog telephones (e.g. DECT phone) for dialing and receiving a video telephony call. For adding video to the voice communication both parties will press the \* button on their telephone keypad.

## 5.3 Content

Siemens HE Solution will generate new revenue streams for the operators. These revenue streams however depend on the end consumer's perception regarding the quality of the content offered. Therefore Siemens has an ongoing program to deliver and facilitate content services to our customers. To offer an attractive VoD service operators need to buy content from the major Hollywood studios and the studios have strict requirements when supplying VoD content. They not only need to be sure the VoD technology used guarantees picture quality but also must be completely confident that when allowing their content to be used they are not open to piracy, which is a problem of significant magnitude in their industry. As such, dealing with studios is notoriously difficult and negotiations can easily fall apart unless handled very carefully.

Siemens has established relationships with the major studios and gained essential and valuable insights into the business. Siemens is fully equipped to be able to advise their customers on the best content acquisition strategy. The major studios all prefer a direct commercial relationship with the operators. In order to enable Siemens customers to deal directly with Hollywood major studio, Siemens has a partnership agreement with 3Vision who are experts in the media and entertainment industry. 3Vision works alongside Siemens to facilitate and negotiate content agreements on behalf of Siemens customers.

Content is a significant component for generating profitable on-demand business

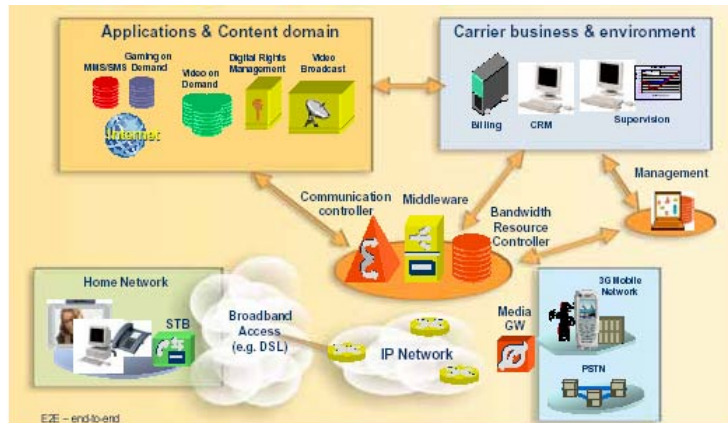


Benchmarking shows that the amount, quality and presentation of content is key to success for on-demand services

## 6 Network Concepts and Products

With SURPASS Home Entertainment, Siemens offers an end-to-end tested and guaranteed solution combining its leading NGN technology with best-of-breed partners. The solution is designed to integrate seamlessly into the existing carrier environment: broadband network, IP network, PSTN, business management systems (billing, CRM, Supervision)

The solution is pure digital, i.e., any video content is stored or transmitted in digital format to the STB using H.264/ MPEG.



SURPASS Home Entertainment network architecture overview

The key components of the architecture are as follows:

### 6.1 Application control

The core of the SURPASS Home Entertainment solution is the middleware application control. It is responsible to provide the IPG/EPG (Interactive Program Guide / Electronic Program Guide) to the user, control the application selection and purchase activities as well as collect data for billing purposes. It includes a subscriber data base with user profiles and authorization as well as a content data base with information about the available applications. The SURPASS Home Entertainment middleware application control is provided by Myrio, acquired by Siemens in April 2005.

### 6.2 Digital Rights Management

The Digital Rights Management (DRM) system provides the content protection necessary to prevent illegal copy and distribution of contents. It provides also Conditional Access (CA) to non-free TV channels. The SURPASS Home Entertainment DRM System is provided by Verimatrix.

### 6.3 Video servers

The Video on Demand (VoD) servers are responsible to store content and send content streams via IP network to the users. The content is stored on hard disks as MPEG2 or MPEG4 encoded files, encrypted by the DRM system. Video on Demand Servers provided by leading partner C-COR (formerly nCUBE)

### 6.4 Video Head-ends

The TV broadcast head end is responsible to convert to an IP stream the television signal from sources such as satellite, cable, terrestrial, video server, tape playout. It is also responsible to encode the signal in real time according to MPEG2 or MPEG4 compression standards. The SURPASS Home Entertainment TV Head End is provided by Tandberg TV.

### 6.5 Home Gateways / Set-top boxes

The Set-top Box (STB) basically provide, together with the Home Gateway (e.g. ADSL modem / router), the interface between the telephone line and the television set. It provides also interfaces to remote control, telephone set, video camera, and keyboard. It has been designed according to the "TV centric" principle, which means that from the look and feel as well as from the user interface it differs significantly from a PC. The STB includes MPEG2/MPEG4 media decoder and middleware and DRM clients for the VoD and IP TV entertainment applications as well as SIP Client and POTS-VoIP conversion software for the video telephony communication application. It supports additionally Internet access and games. The SURPASS Home Entertainment STB is provided by Siemens Com CPE, STB from other vendors are integrated as well.

### 6.6 Bandwidth resource control

The Bandwidth Resource Control assures that the required QoS will be available when the network accepts a service request from the user for the VoD and video telephony services. This mechanism concentrates on the admission control in the access as the critical point for service delivery, considering that the mechanisms to provide QoS in the IP backbone network are well established.

The SURPASS Home Entertainment Bandwidth Resource Control is provided by SURPASS hiQ40.

### 6.7 Communication controllers

To provide STB-based communication services such as video telephony, VoIP and interworking with the PSTN, a SIP Proxy/Registrar and LDAP server, a softswitch and media gateways are required. The controller necessary depends on the type of service to be offered, e.g. video telephony only between STB within the network or VoIP to the PSTN, with or without time base charging.

The SURPASS Home Entertainment communication controllers are SURPASS hiQ6200, SURPASS hiQ30 and SURPASS hiE9200.

## 7 List of Abbreviations

ADSL .....	Asymmetric Digital Subscriber Line
AoD .....	Audio on Demand
BRAS.....	Broadband Remote Access Server
CBR.....	Constant Bit Rate
CLE.....	Customer Located Equipment
CLEC.....	Competitive Local Exchange Carrier
CPE .....	Customer Premises Equipment
DECT .....	Digital Enhanced Cordless Telecommunications
DSL .....	Digital Subscriber Line
DTV .....	Digital TV
DVB .....	Digital Video Broadcast
DVD .....	Digital Versatile Disk
EPG.....	Electronic Program Guide
GUI .....	Graphical User Interface
HTML.....	Hypertext Mark-up Language
ILEC .....	Independent Local Exchange Carrier
IoTV .....	Internet over TV
IP .....	Internet Protocol
IPG .....	Interactive Programming Guide
ISP.....	Internet Service Provider
MMS .....	Multimedia Message Service
MP3 .....	MPEG-1 Audio Layer-3
MPEG.....	Motion Picture Expert Group
OEM .....	Original Equipment Manufacturer
PC.....	Personal Computer
PDA .....	Personal Digital Assistant
PIN.....	Personal Identification Number
PPV .....	Pay Per View
PSTN.....	Public Switched Telephone Network
PVR .....	Private Video Recorder
QoS .....	Quality of Service
SIP.....	Session Initiation Protocol
SMS.....	Short Message Service
STB.....	Set-Top Box
TV.....	Television
UMTS .....	Universal Mobile Telecommunication System
VDSL .....	Very High Speed Digital Subscriber Line
VidTEL.....	Video Telephony
VoD.....	Video on Demand
VoIP .....	Voice over IP