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Alcatel-Lucent Canada
Update

Mike McKeon
May 14, 2009

Alcatel-Lucent

- Presence in more than 130 countries
- Annual Revenues: €17B (2008)
- Employees: ~77,000 (24,000+ in Americas)
- R&D
  - €2.7 B, Next Generation accounts for 60%
  - Active Patents: More than 25,000
  - 600 experts participating in 100 standards organizations
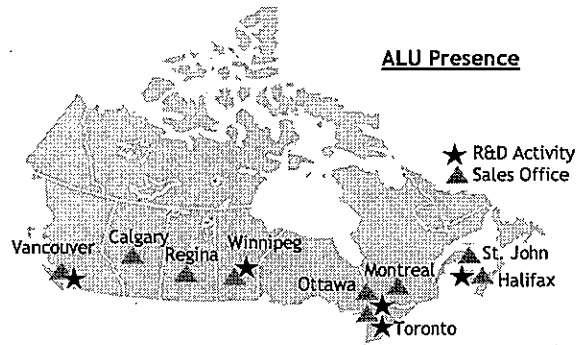
Our Strategy
We seek to combine the trusted capabilities of the network with the creative freedom of the Web and make it work together

Revenues by Segment & Geography

Enterprise 9%
Services 20%
Carrier 68%

Asia Pacific 19%
RoW 16%
Europe 35%
NA 30%
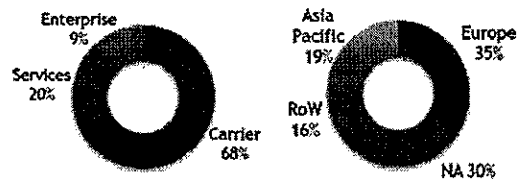
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Alcatel-Lucent Presence in Canada

- Business Group activities
  - IP, Access, Optics, WCDMA, Genesys (IVR)
  - ~$240M annually in R&D in Canada

- Commercial operations
  - Sales, Engineering, Operations, Finance
  - Major supplier to all Canadian Telcos

- Support for education & community
  - Universities e.g. UNB Nanotechnology
  - Many charitable engagements

ALU Presence

★ R&D Activity
▲ Sales Office

Vancouver Calgary Regina Winnipeg St. John
Ottawa Montreal Halifax
Toronto

~ 3,000 employees in Canada serving in-country and global customers

Alcatel-Lucent - Confidential
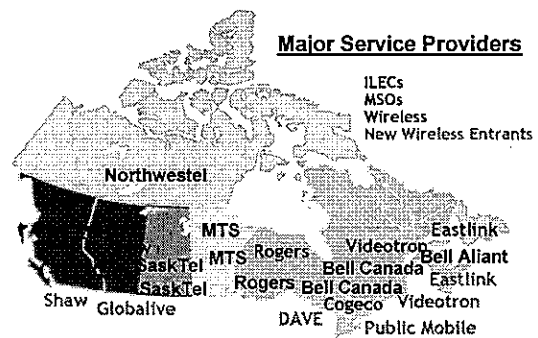
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Canada Market

Customer investment in 2009
  - WCDMA builds
  - Broadband access
 - IP network transformation
  - Customer experience

Customer hot topics
  - New wireless entrants launching YE'09
  - MSOs gaining triple-play share
  - Cost of transition to next generation

Major Service Providers

ILECs
MSOs
Wireless
New Wireless Entrants

Northwestel

MTS Eastlink
SaskTel MTS Rogers Videotron Bell Aliant
SaskTel Rogers Bell Canada Eastlink
Shaw Globalive Bell Canada Cogeco Videotron
DAVE Public Mobile

Canada Service Provider revenues~ $35B

Wireline: Bell & TELUS - 80% share

Wireless: Bell, TELUS, Rogers - 95% share

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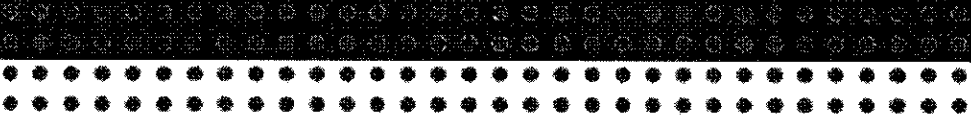
Digital Life

Industry Canada: Taiwan NCC, Chung-Hwa Telecom

May 14, 2009

OTT and Service Provider Applications Battle

To Over-the-top providers...

You**Tube** myspace.com *a place for friends* skype

Google *Video* hulu eBY

BlackBerry. XBOX 360

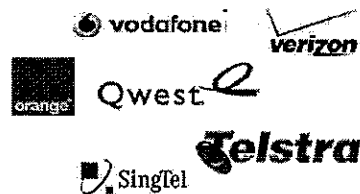### To Network service providers...

vodafone verizon

orange Qwest

SingTel Telstra

....Service is about Experience

- **Content & application providers:** Video snacking; E-commerce, Social networking, Advertising based business model

- **End-User device vendors:** Bundling of devices and services (music, video, maps / navigation, games)

...Service is about Access & Connection

- Voice services
- Messaging services
- Mobile content services
- IPTV entertainment services

Increased competition from a broader set of market players is shifting value from access-centric to user-centric business models

What is the Digital Life?

- The intersection of the digital home, advanced mobile networks, next generation consumer devices and compelling content
- The ability to access a virtually unlimited selection of content, including pay-TV and Internet content, anytime through the device of your choosing (including televisions, mobile phones, and PC's)
- The ability for broadband service providers to unify offer presentation, payment, and use for certain valuable Internet content (all which is discovered, accessed, and paid for in an ad hoc fashion today)
- Enabling creative, new services in the home through an open applications platform, including the monitoring and control of a home's environment (e.g., energy or security)
- Having access to the above 24x7, while at home or on-the-go
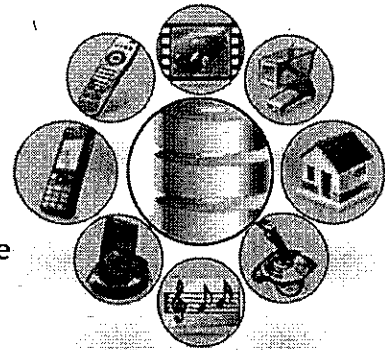
Creating a Sticky Environment that Builds Brand Recognition & Loyalty

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Trends in Home Networking

CPE evolution to smart RGW: Central Hub for communication
- Delivering 'services' demands a smart network: LAN diagnostics, QoS
- Operator Managed Device - TR69
- More interfaces: Hlan, Femto, Zigbee/Zwave

Media moving to the Web
- Photo's ARE digital, film roles are history...
- Online music (itunes) has taken over retail sales of physical music media
- Web based Video on the rise: Hulu, Netflix, Blockbuster, Amazon, Youtube...
  - Convience and Convergence: Any content, any Device
  - QoE, Device and License Management, DRM -> DECE

Smart Energy
- Environmental Concerns demand for Conservation
- Manage the peak consumption to reduce Grid utility burden
  - Leverage IP networks to actively manage consumption at micro-level
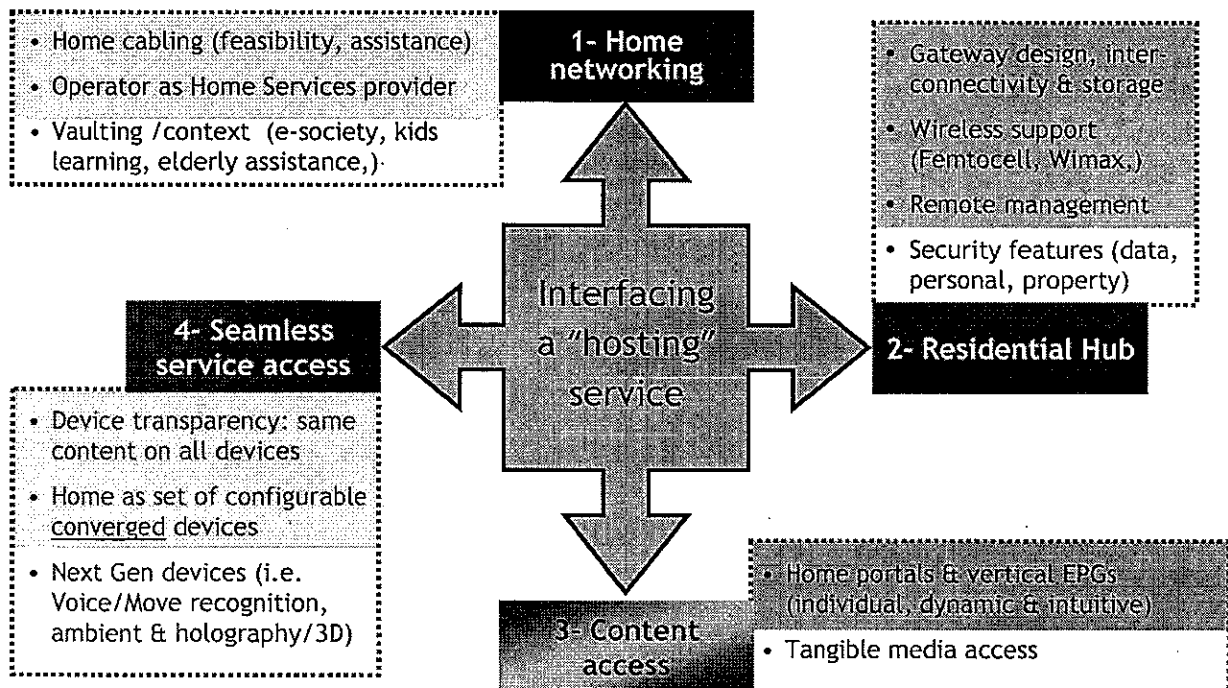
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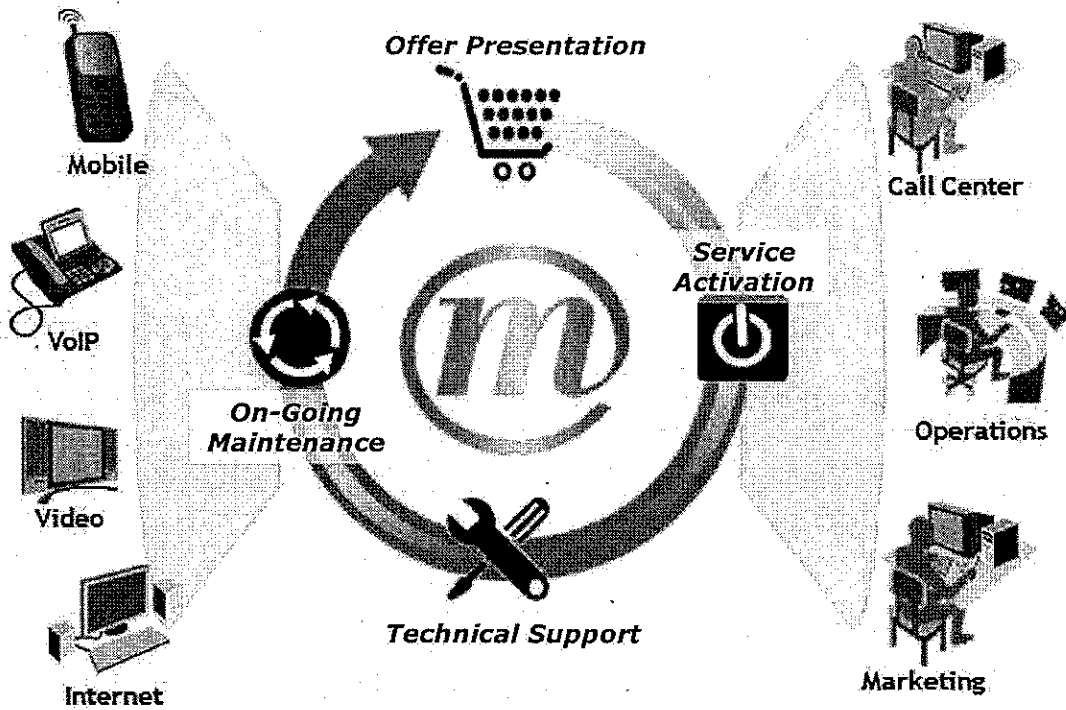
What is this Connected Home?

Let's face it - the home and all of its connectivity is complicated so the explanation of the connected home is somewhat complicated

- A home with a device that integrates connectivity
- A home with an interface (GUI) that makes user interaction easy and consistent
- A home where cell phones, tablets and things like iPods are part of the user interface
- A home where any screen can display the information desired
- A home where new services can be purchased and added easily
- A home that takes advantage of the technology and simplifies its use to bring value to the home owner.
- A home where the network connecting the home allows the Quality of Experience to be what the user expects
- A home where the service provider can support, diagnose and trouble shoot issues remotely for the user

A Connected Home Strategy Requires a Managed Network Element in the Home

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Four key components for successful Operators' Connected Home

- Home cabling (feasibility, assistance)
- Operator as Home Services provider
- Vaulting /context (e-society, kids learning, elderly assistance,)

1- Home networking

- Gateway design, inter connectivity & storage
- Wireless support (Femtocell, Wimax,)
- Remote management
- Security features (data, personal, property)

Interfacing a "hosting" service

4- Seamless service access

2- Residential Hub

- Device transparency: same content on all devices
- Home as set of configurable converged devices
- Next Gen devices (i.e. Voice/Move recognition, ambient & holography/3D)

3- Content access

- Home portals & vertical EPGs (individual, dynamic & intuitive)
- Tangible media access

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Digital Life Management Offerings

Offer Presentation

Mobile

VoIP

Video

Internet

Call Center

Operations

Marketing

Service Activation

On-Going Maintenance

Technical Support

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7

The Home is evolving to be an intelligent point of presence in the network

Connected Home

Quad Play

Gateway & Femto

Triple Play & BB Home

Residential Gateway

Networked Home

Router/ Modem

High Speed Internet

Simple Modem

Increasing proportion of SP spend

Increased value for consumer
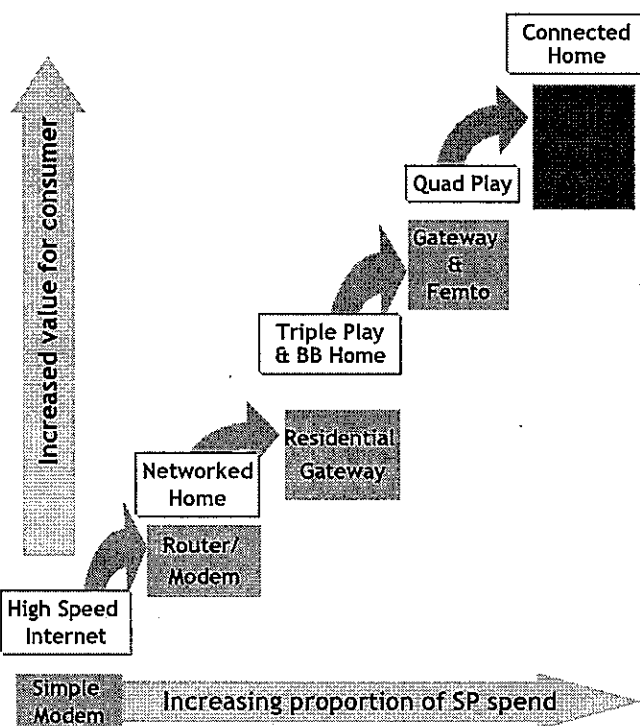
BB Connectivity + VoIP + Media Services

DBS & IPTV | Portal Content | Photos +
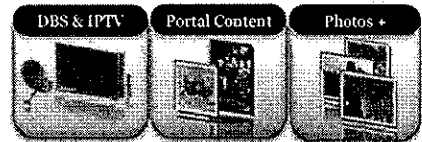
Applications & Home Services

Smart metering | Home Automation | Video surveillance

Device Management

Media Sharing between devices | interface across user devices | Service Monitoring
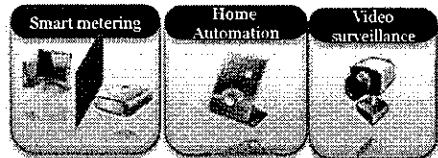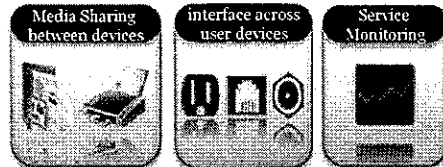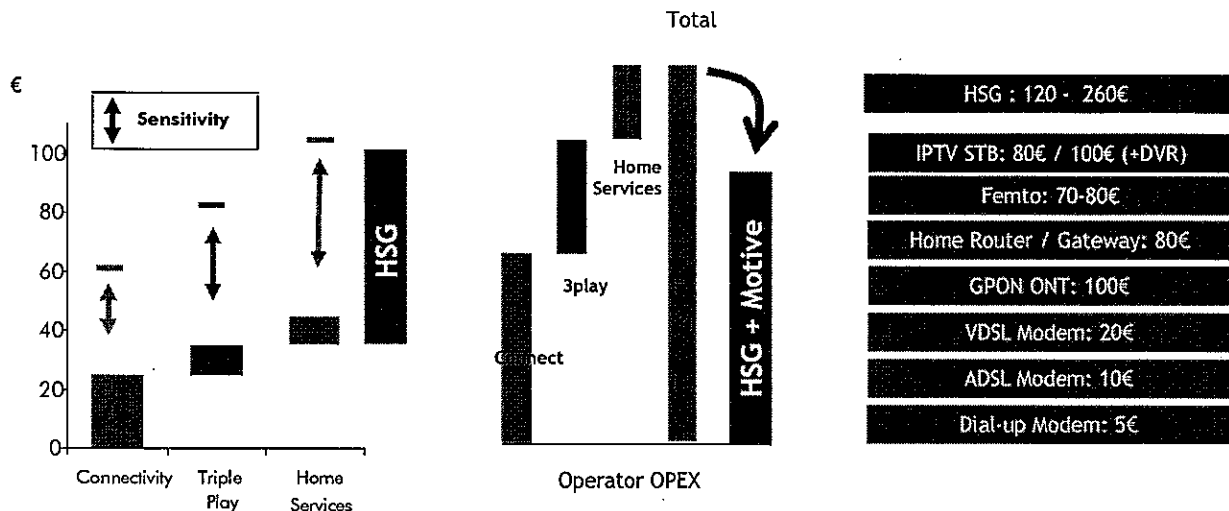
Same software across different hardware variants optimized per market

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Service Providers Opportunities and Challenges in the Home

Capture new revenues	Reduce Home OPEX	Cap Home CAPEX

Total

€

- Sensitivity

100
80
60
40
20
0

Connectivity | Triple Play | Home Services

HSG

Home Services

3play

Connect

HSG + Motive

Operator OPEX

HSG : 120 - 260€

IPTV STB: 80€ / 100€ (+DVR)

Femto: 70-80€

Home Router / Gateway: 80€
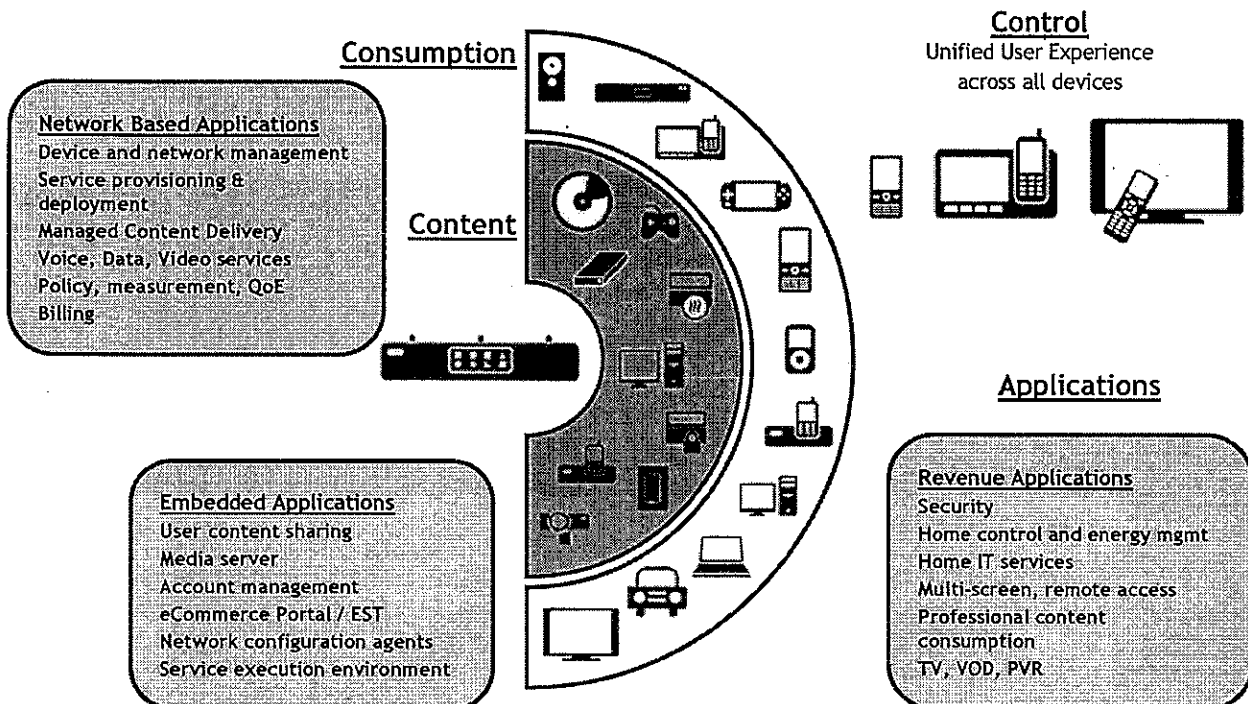
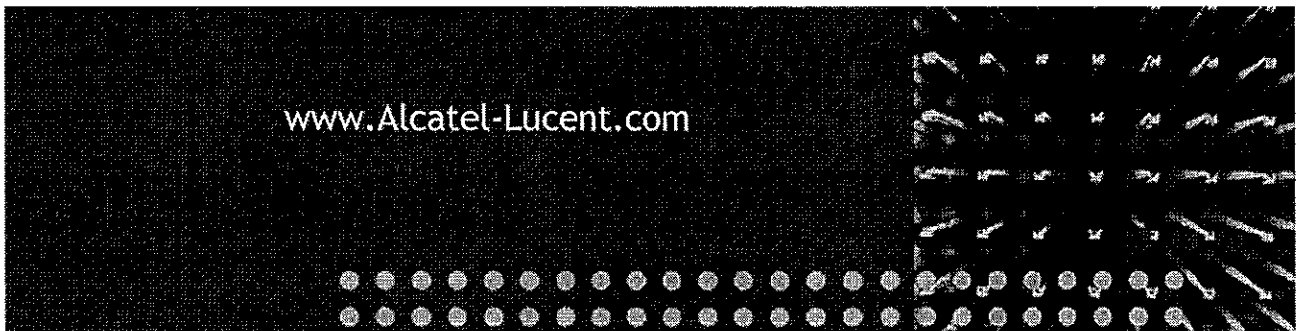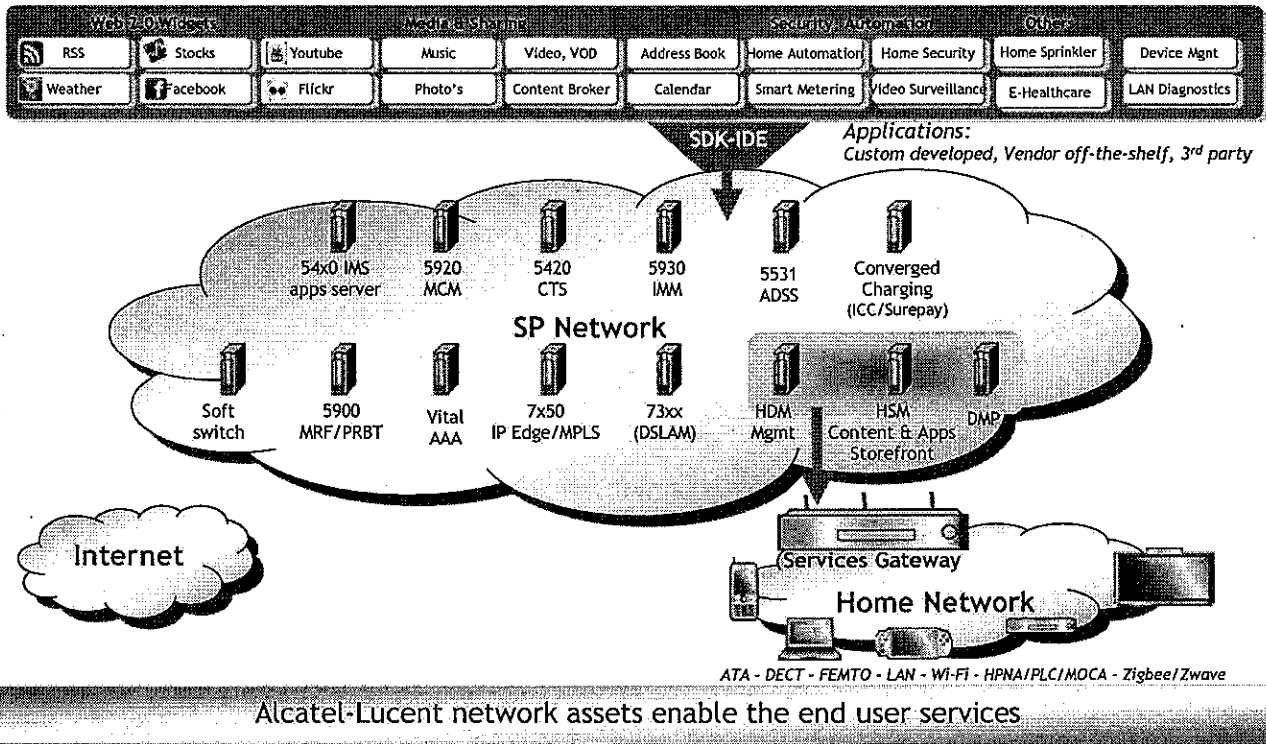GPON ONT: 100€

VDSL Modem: 20€

ADSL Modem: 10€

Dial-up Modem: 5€

Main Challenges for Service Providers : develop the ability to increase revenues competing with OTT players and reduce the Home Opex/Capex

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Home Services solutions
Applications, Content, Consumption, and Control in a Unified User Experience

Consumption

Content

Control
Unified User Experience
across all devices

Network Based Applications
Device and network management
Service provisioning &
deployment
Managed Content Delivery
Voice, Data, Video services
Policy, measurement, QoE
Billing

Embedded Applications
User content sharing
Media server
Account management
eCommerce Portal / EST
Network configuration agents
Service execution environment

Applications

Revenue Applications
Security
Home control and energy mgmt
Home IT services
Multi-screen, remote access
Professional content
consumption
TV, VOD, PVR

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It's the Network that enables Digital Life Services

Web 2.0 Widgets			Media Sharing		Security/Automation			Others
RSS	Stocks	Youtube	Music	Video, VOD	Address Book	Home Automation	Home Security	Home Sprinkler	Device Mgnt
Weather	Facebook	Flickr	Photo's	Content Broker	Calendar	Smart Metering	Video Surveillance	E-Healthcare	LAN Diagnostics

SDK-IDE

Applications:
Custom developed, Vendor off-the-shelf, 3rd party

SP Network

- 54x0 IMS apps server
- 5920 MCM
- 5420 CTS
- 5930 IMM
- 5531 ADSS
- Converged Charging (ICC/Surepay)
- Soft switch
- 5900 MRF/PRBT
- Vital AAA
- 7x50 IP Edge/MPLS
- 73xx (DSLAM)
- HDM Mgmt
- HSM Content & Apps Storefront
- DMP

Internet

Services Gateway

Home Network

ATA - DECT - FEMTO - LAN - Wi-Fi - HPNA/PLC/MOCA - Zigbee/Zwave

Alcatel-Lucent network assets enable the end user services

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Taking IPTV to the Next Level
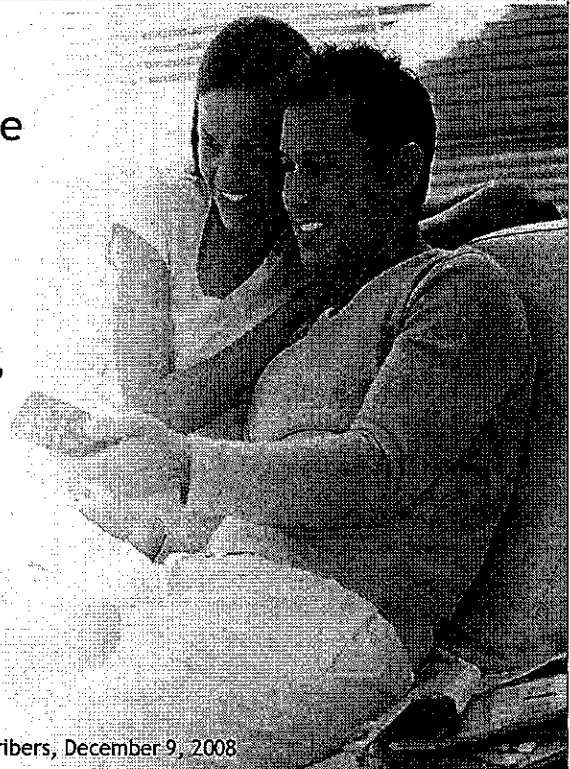
TPSDA 2.0 & Application Assurance

Jim Guillet

Product Marketing, IP Division

The Opportunity

"We have a very competitive and capable linear TV offering, and the push now is to begin further differentiation of this service relative to what others in the entertainment space can provide"

John Stankey
President and CEO, AT&T Operations

Source: Telephony Online, reporting on U-verse surpassing 1M subscribers, December 9, 2008

The Challenge

"Given the pace at which the Internet world is evolving, the challenge all operators face is how to cost effectively evolve their delivery infrastructure to meet growing customer expectations for an instantaneous high quality entertainment experience"

Jouni Forsman
VP Research, Gartner

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Mass Market Shift toward Personalized & Interactive HD Entertainment

Opportunity

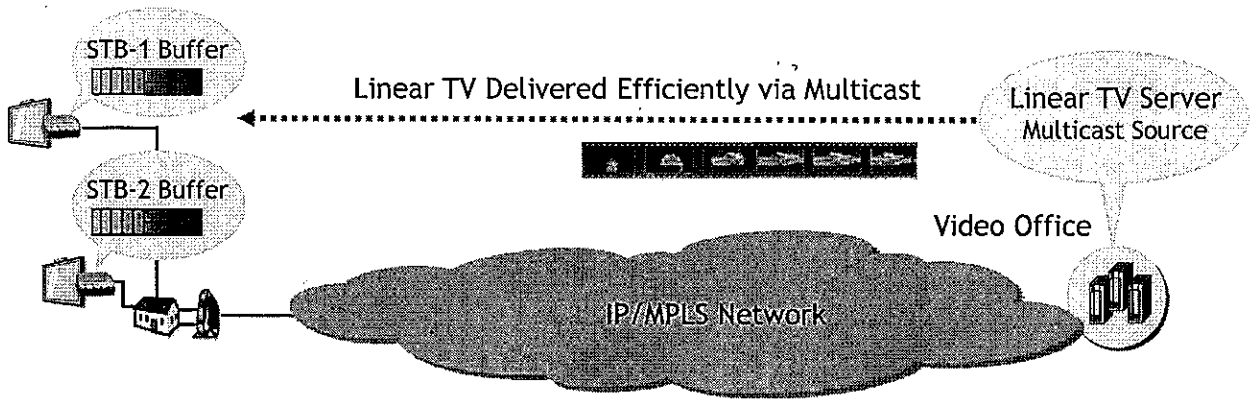| Basic TV Service | Personalized, Improved Quality TV | Interactive TV | Multiscreen Entertainment |

Challenge

Service, Bandwidth & Personalization

Standard Definition to High Definition Video
Single Room to Multi-room & Multi-screen
Multicast to Unicast Routing

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Case Study: Assured QoE for Linear TV with High Definition and Multi-room Offers

STB-1 Buffer

Linear TV Delivered Efficiently via Multicast

Linear TV Server
Multicast Source

STB-2 Buffer

Video Office

IP/MPLS Network

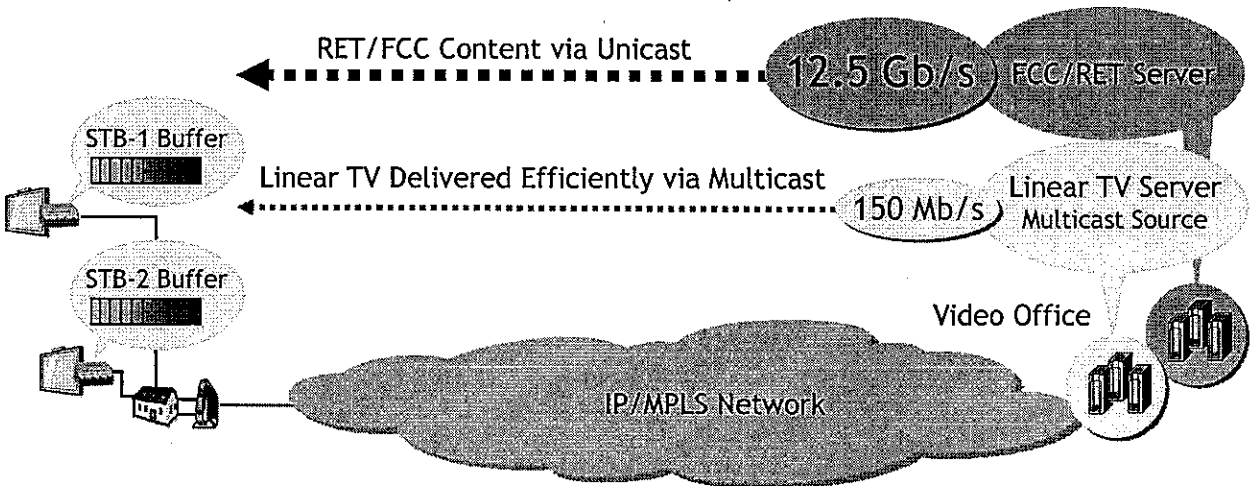### Visual Impairments ➡ Retransmission

MPEG4 sensitivity to transmission errors compounded by:
- Powerline/WiFi networking technologies increase noise in the home LAN
- Increase in DSL line capacity

Slow Channel Changing ➡ Fast Channel Change

Aggressive MPEG4 compression increases I-frame intervals to 3 – 5 seconds

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Assured QoE with RET/FCC ... and Exposing the Cost of Personalization

RET/FCC Content via Unicast

12.5 Gb/s FCC/RET Server

STB-1 Buffer

Linear TV Delivered Efficiently via Multicast

150 Mb/s Linear TV Server Multicast Source

STB-2 Buffer

Video Office

IP/MPLS Network

Source: Alcatel-Lucent - Typical Tier 1 Network

RET/FCC unicast uses 8 times more bandwidth than all multicast channels

Excessive TCO for massive scaling of personalized services
... even higher for those with high concurrency e.g., Pause Live TV

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Alcatel-Lucent Triple Play Service Delivery Architecture (TPSDA)

The Blueprint for IPTV across the globe
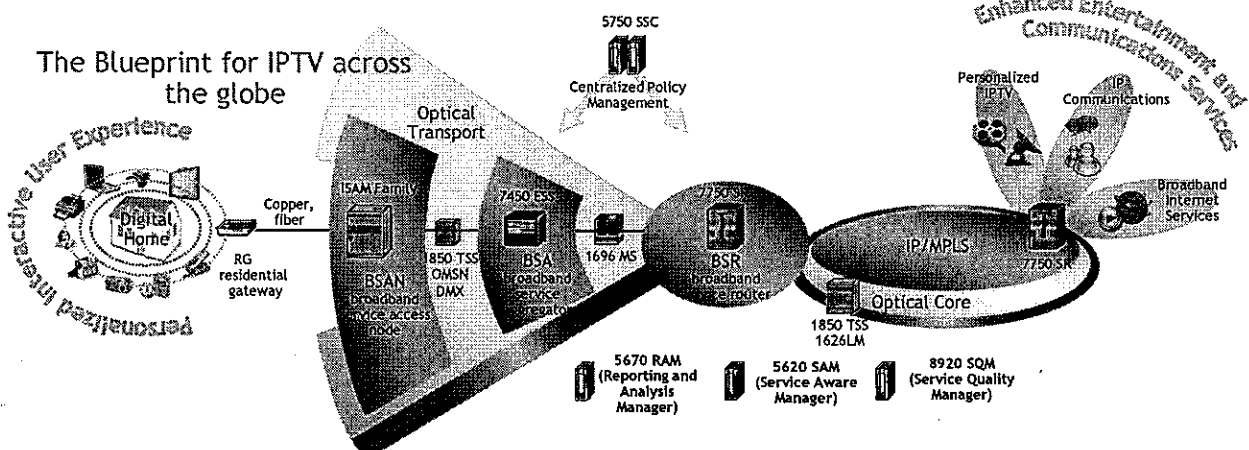
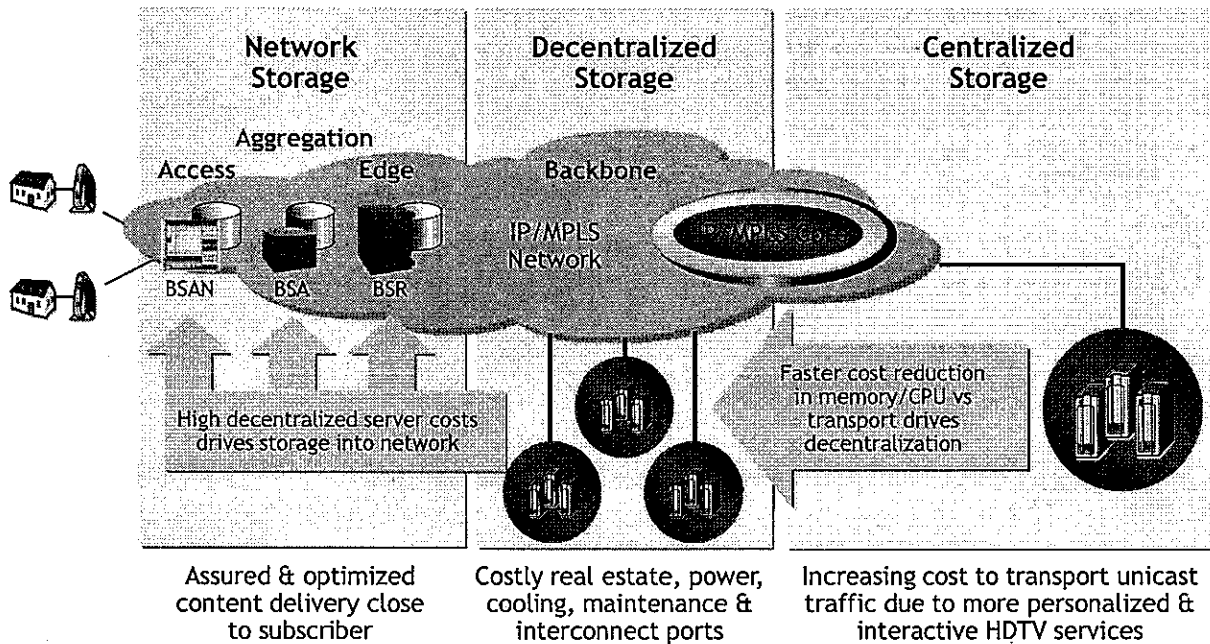| Key Attributes	Value Proposition	Credentials
• High availability - redundancy and resiliency mechanisms at all layers • Fine-grain QoS on a per-service/application/subscriber basis • Distributed policy resource control • Centralized network, service and subscriber management • Secure network access and content e2e	• Assures Quality of Experience with non-stop service delivery • Distributed intelligence ensures multi-dimensional scalability to accommodate massive growth • Provides ultimate flexibility to accelerate deployment and service innovation	• Proven in 50+ carrier networks • Validated by Isocore for mass deployment (80k residential subscribers)

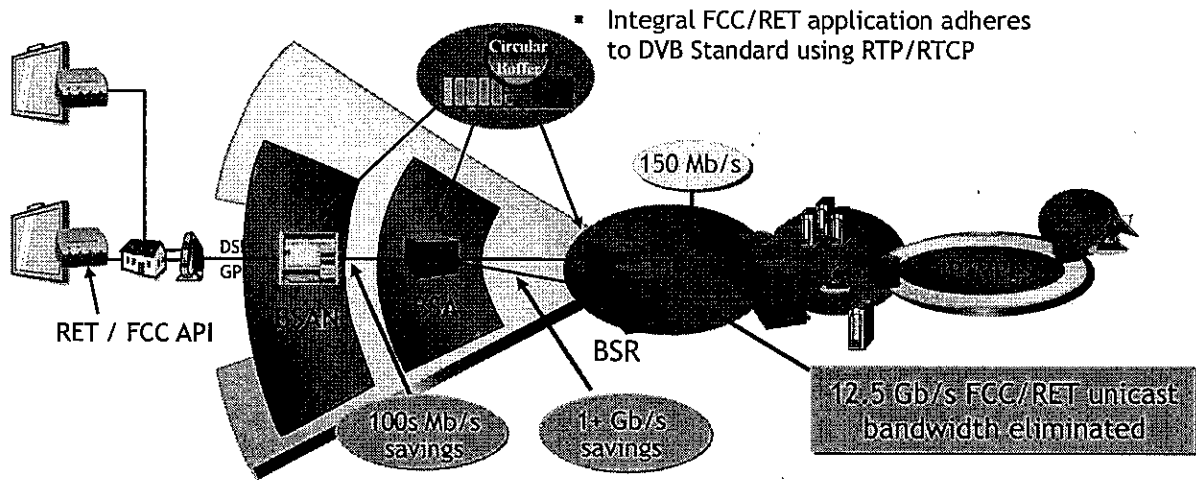Alcatel·Lucent

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Declining Memory/CPU Costs Enabling New Content Distribution Architectures

Network Storage	Decentralized Storage	Centralized Storage
Assured & optimized content delivery close to subscriber	Costly real estate, power, cooling, maintenance & interconnect ports	Increasing cost to transport unicast traffic due to more personalized & interactive HDTV services

Low TCO crucial to profitable, mass market personalized services

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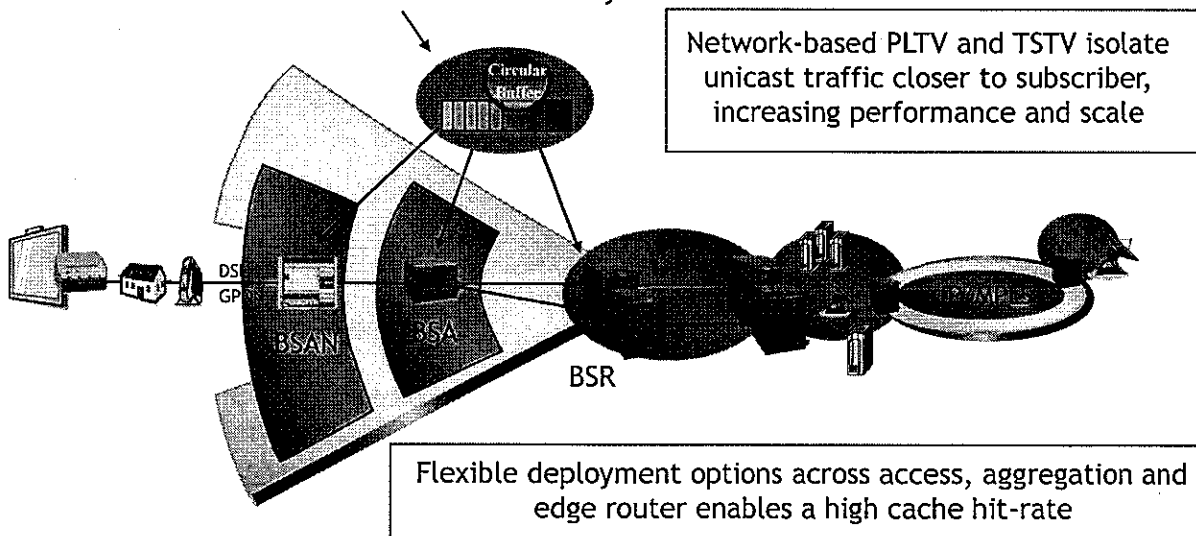## Assured & Optimized IPTV Delivery with Network-based RET/FCC

Network-based RET/FCC offers a distributed hierarchy across access, aggregation and edge router elements, providing an optimal reduction of unicast traffic with QoE assurance

- Integral FCC/RET application adheres to DVB Standard using RTP/RTCP

Circular Buffer

150 Mb/s

RET / FCC API

BSR

100s Mb/s savings

1+ Gb/s savings

12.5 Gb/s FCC/RET unicast bandwidth eliminated

Assured and scalable QoE at an optimized TCO = more homes passed, more HDTV and more multi-room deployments

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Extending Network-based Foundation to High Concurrency IPTV Applications

Expanding RET/FCC cache from minutes to hours enables and optimizes network-based PLTV and TSTV for all channels simultaneously
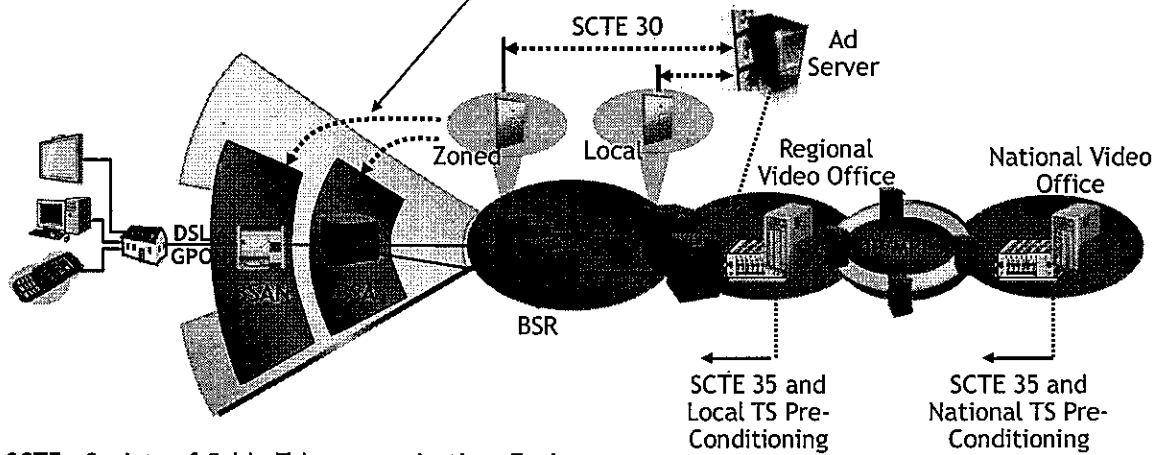
Circular Buffer

Network-based PLTV and TSTV isolate unicast traffic closer to subscriber, increasing performance and scale

BSR

Flexible deployment options across access, aggregation and edge router enables a high cache hit-rate

Foundation for assured & optimized content delivery into the future

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Enabling the Development of New Television Advertising Business Models

Distributed, network-based Ad insertion provides a flexible and consistent operational model for national, local, zoned and targeted advertising

Over time, differentiated applications migrate even closer to the subscriber as Ads become increasingly targeted and interactive e.g., telescoping
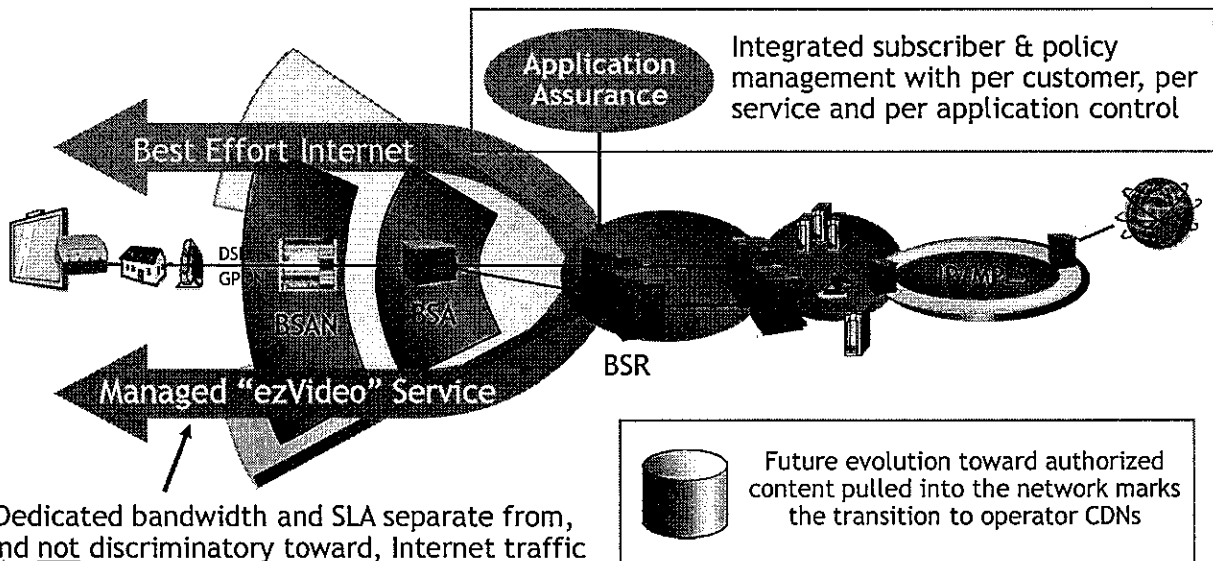

SCTE 30

Ad Server

Zoned   Local   Regional Video Office   National Video Office

DSL GPO

BSR

SCTE 35 and Local TS Pre-Conditioning

SCTE 35 and National TS Pre-Conditioning

SCTE - Society of Cable Telecommunications Engineers

Ad insertion with RET/FCC ensures post-splice sychronization and a high QoE

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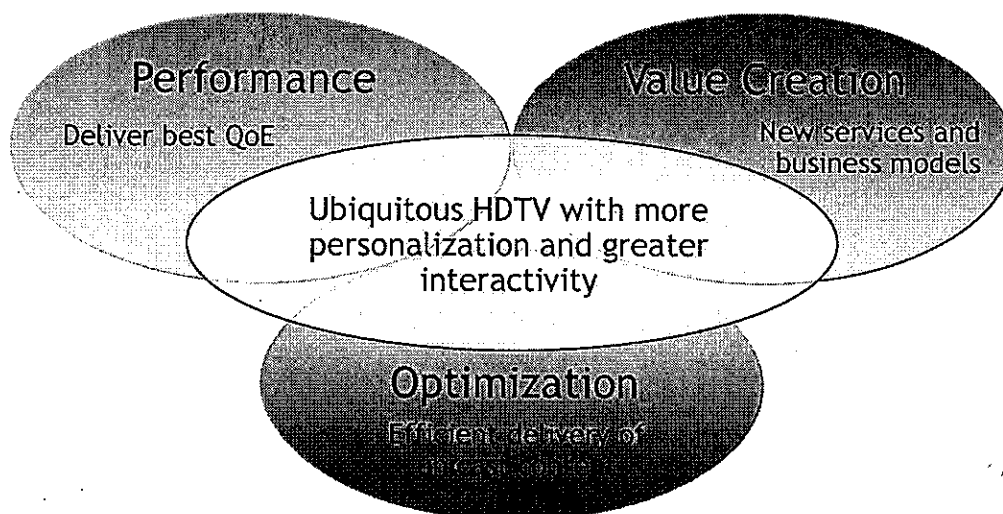## Enabling the Development of New OTT Video Business and Service Models

Application assurance provides a positive, value-centric approach to OTT content, facilitating a new portfolio of managed online services

Application Assurance

Integrated subscriber & policy management with per customer, per service and per application control

Best Effort Internet

DSL GP

BSR

Managed "ezVideo" Service

Future evolution toward authorized content pulled into the network marks the transition to operator CDNs

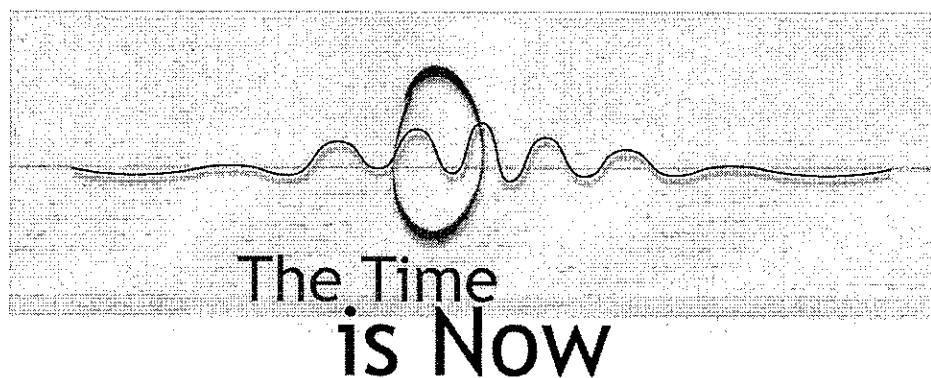Dedicated bandwidth and SLA separate from, and not discriminatory toward, Internet traffic

Let users, content owners, advertisers and other key actors in the value chain to choose the QoE they want, for the content they care about, and at the price they are prepared to pay

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Performance
Deliver best QoE

Value Creation
New services and business models

Ubiquitous HDTV with more personalization and greater interactivity

Optimization
Efficient delivery of

Profitable foundation for an unprecedented user experience and emerging business models

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The Time
is Now

IPTV operators have a genuine opportunity to eclipse the quality of experience enabled by traditional broadcast technologies

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