SBB — SERBIA BROADBAND - SRPSKE KABLOVSKE MREŽE

Serbia Broadband - Srpske Kablovske Mreže

Presentation for the
Belgrade Business Breakfast
Predrag Djurdjevic, CTO

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- SEEF I (South East Equity Fund), investment in 2002
- Mid-Europe Partners (equity fund) is new major owner of SBB.
- SBB has 700 employees and are placed in 26 towns with Cable-TV network.
- In February 2007 RATEL stated that SBB is Significant Market Player in distribution of CATV broadcasting.
- Broadband Internet from the end of 2002.
- DTH service from the May 2006.
- In Mid October 2007 SBB started to deliver Digital TV on Cable – D3 service.

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SBB growth 2000 - 2007

- 2000 – foundation of the company KDS Kragujevac
- 2001 – 2 business units
- 2002 – 11 business units, 109 employers
- 2003 – 20 business units, 268 employers
- 2004 – 22 business units, 452 employers
- 2005 – 24 business units, 573 employers
- 2006 – 25 business units, 614 employers
- 2007 – 26 business units, 661 employers

- More then 1,000 subcontractor employers and contributors engaged

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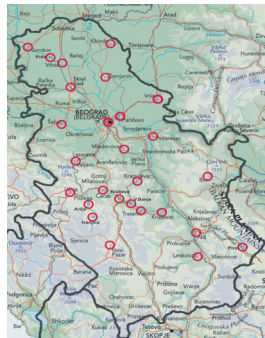
Objectives

- **Increase number of Subscribers.**
  May 2002 – 2000 subs.
  Build-up small Head-ends.
  Instalation of the coaxial last-mile coonections.

- **Build the Network: Technical objectives – Year 2002**
  Fully two-way Broadband networks
  HFC - Hybrid Fiber-optic Coaxial design
  Large deployment of optical cables
  Optical HUB-s replace smal Head-ends
  Fiber Nodes serves up to 1200 HP subs, radius max 2km
  Up to four line amplifiers in cascade
  EuroDOCSIS 1.1 standard for Cable Internet
  Two networks in one physical network
      Green - HFC for Video services and Cable internet
      Blue - Optical Metro ETHERNET

- **Build the Network: Technical objectives - Today**
  Deep Fiber Nodes – 400 subs per node
  FTTx, curb, building, business
  100 Cable Modems per Node, more BW in the DS
  EURODOCSIS 3.0
  DWDM and/or CWDM in Backbone and Metro applications
  MPLS
  Multi-service platform ready for new services

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Multiservises platform ready for new services

Today services	Services in planning
Analog TV	HD TV DTH
Digital TV cable	HD TV cable
Cable Internet	VoD
FIber Internet	VoIP
WiFi - HotSpot Internet	Fiber Channel VPN servisi
VPN services (MPLS, IPSec, Ethernet)	SDH leased line (od STM-1 do STM-16)
ADSL access for VPN and Internet	PDH leased line (E1, E3)
DTH	IPTV transport and IPTV streaming

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Objectives and facts

- **Content creation**
  Market was under-developed
  Content was unlegaly distributed
  Billing and charging from the subscribers was veru difficult
  First contacts with content owners
  SBB become leader of innovation in content delivery and content creation
  SBB maximise its positioning of services, on the basis of good content and QoS

- **Service creation, service agility and accelerated service Innovation**
  Analog TV, Pay Tv, IPTV transport, IP DOCSIS services, L2, VPN, ADSL, Digital TV services, DTH services.

- **Future drivers**
  Delivering Video services over broadband as a killer application
  Video content explosion,
  HDTV
  "My services" on "My time" (VoD, set-top +DVR. Shifted TV),
  Personalized advertising
  Blended services: for Millennial Generation, Social TV, Sport, Film, Entertainment, etc.

SBB DTH – Total TV service
(DVB-S)

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DTH

- May 2006 – Commercial launching of the DTH service for the Serbian market
  ▸ "Total TV" (satelit Eutelsat W2)
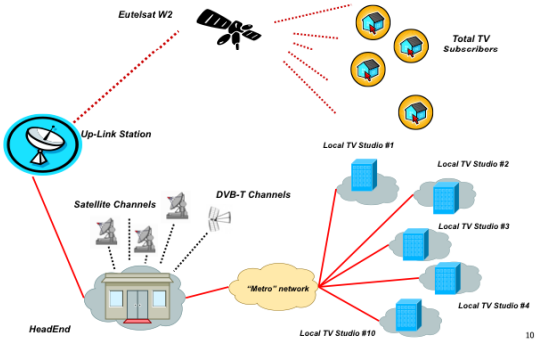- 39 TV channels (21 domestic i 18 satellite) + 200 free-to-air channels from Hot Bird and Astra

total TV
Kablovska preko satelita

Totalna pokrivenost!

totalTV

Why DTH service?

SBB

❖ It is the only platform that enables wide coverage from a point (single satellite), even in non-urban areas

❖ May broadcast a large number of channels without usage of significant spectrum resources

❖ Based on Ku-band satellites that transmit digitally -compressed TV and CD-quality audio signals

❖ Low cost receiving equipment

Global platform view

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Eutelsat W2
Total TV Subscribers
Up-Link Station
Local TV Studio #1
Local TV Studio #2
Satellite Channels
DVB-T Channels
Local TV Studio #3
"Metro" network
Local TV Studio #4
HeadEnd
Local TV Studio #10

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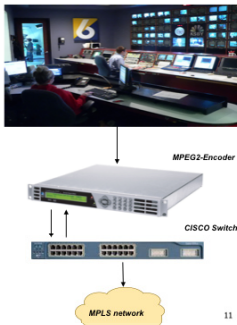
IP transport from TV studios to Headend

SBB

- 20 TV stations connected to SBB's optical fiber infrastructure
- In order to provide the best quality signal, most of the domestic channels are encoded directly in the local TV studios
- 7 Mb/s bandwidth from studio to headend
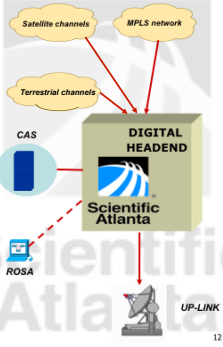- MPEG2 encoders are remotely controlled

MPEG2-Encoder
CISCO Switch
MPLS network

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Digital Headend

SBB

- Transrating and multiplexing
- 3,3 Mb/s average bitrate per channel
- Scrambling in NDS-Videoguard Conditional Access System
- All services are multiplexed in four separate transport streams
- Transport all TSs to uplink station

Satellite channels
MPLS network
Terrestrial channels
CAS
DIGITAL HEADEND
Scientific Atlanta
ROSA
UP-LINK

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Headend - Transrating

- Saves up to 30% of input bitrate
- Statistical re-multiplexing
- Rate limiting
- TS overflow protection
- Reduce overall capacity and transmission cost

Input bitrate   Output bitrate

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4.8m Uplink station

4.8m Antenna

- Motorized system
- Antenna Control Unit for automatic positioning
- Four-port feed with beacon receiving ability
- Digital Tracking Receiver for satellite tracking
- Antenna gain 54dB
- 1+1 HPA 750W

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SBB

3.8m Uplink station

3.8m Antenna

- Dual offset antenna
- Four-port feed
- Antenna gain 52dB
- 1+1 HPA 750W
- Remote control

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Transport streams

- Four transport streams
- Four transponders on satellite Eutelsat W2 (16°E)
- 0,9m antenna sufficient to receive a signal
- Signal available in all former Yugoslav Republics

No.	Transponder	TS Name	Transport Stream ID	Uplink Frequency MHz	Downlink Frequency MHz	Symbol Rate kS/s	FEC	FEC Outer	Info Bit Rate Mbit/s
1	B2	Total TV 1	30201	14272,17 H	10972,17 V	27500	3/4	188 188/204	38,015
2	D5	Total TV 2	50700	13854,41 H	11554,41 V	30000	7/8	188 188/204	48,382
3	C11	Total TV 3	41100	13208,50 H	11428,25 V	30000	5/6	188 188/204	46,078
4	B3	Total TV 4	30300	14394,61 V	11094,61 H	27300	3/4	188 188/204	37,738

$1 Mbit/s = 10^6 b/s$

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Satellite capacity

- SBB Total current capacity on W2 is 170Mbit/s
- On the 1Q of 2009, Eutelsat will replace satellite on 16° east position with new one, which will has new generation of transponders
- The name of new satellite will be W2M
- SBB Total capacity on W2M will be 220 Mbit/s

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Monitoring and Control

- All units are connected with ROSA monitoring and control system
- SNMP, IIOP, APOLLO, RCDS communication protocols
- Rosa Element Manager for units with RS232
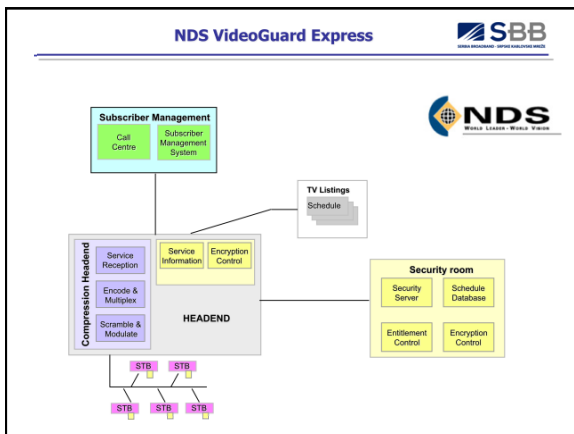- Monitoring and control through Web browser

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Monitoring

- Monitoring over ROSA management system.

- Pixelmetrix monitoring system will be introduced.

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CAS

SBB

NDS VideoGuard Express

SBB

NDS
WORLD LEADER · WORLD VISION

Subscriber Management
- Call Centre
- Subscriber Management System

TV Listings
- Schedule

Compression Headend
- Service Reception
- Encode & Multiplex
- Scramble & Modulate
- Service Information
- Encryption Control

HEADEND

Security room
- Security Server
- Schedule Database
- Entitlement Control
- Encryption Control

STB STB STB STB STB

NDS Guide

SBB

- Application which is installed on the receiver for digital services scrambled in NDS Videoguard CAS
- Graphical interface for simple usage and quick approach to all information
- Implemented Electronic Program Guide
- Program banner, content description, reserving program, B-mail, parental rating, fingerprinting
- Automatic software download is supported
- NDS Guide support English, Serbian, Croatian and Slovenian languages

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Total TV services – Today

totalTV

- ❖ Total TV offers 74 most popular domestic and satellite channels

- ❖ The most of satellite channels include translation in Serbian language

- ❖ Channels are carefully chosen (general, sport, film and children channels) and divided into 19 packages

Total TV Services

SBB

Total TV Services

B2		D5		C11		B3		Simulcrypt	
1	Viasat History	14	Ultra	28	Panonija	42	Televizija S	53	Eurosport
2	Viasat Explorer	15	B92	29	Palma Plus	43	Happy Cable	54	National Geographic
3	TV1000	16	Studio B	30	Spectrum	44	E!	55	HBO
4	FreeX-TV 2	17	SOS	31	Avala	45	Minimax	56	FOX Crime
5	X-Dream TV	18	Cinemania	32	Fox	46	B92 Info	57	FOX Life Regional
6	FreeX-TV	19	DoQ	33	HBO Comedy	47	History Channel	58	Animal Planet
7	MTV Adria	20	Enter	34	Top Shop TV	48	Romantica	59	Discovery
8	BBC Prime	21	Sport Klub	35	Sport Klub +	49	Reality	60	Pink
9	Kanal D	22	Film +	36	Travel	50	Jetix	61	Pink Action
10	Motors TV	23	Happy/Košava	37	Metropolis	51	Sport Klub HR	62	Pink BH
11	Hallmark	24	RTS 1	38	OBN	52	Alfa	63	Pink Extra
12	Kopernikus	25	RTS 2	39	RTRS			64	Pink Film
13	Most	26	Super TV	40	ATV			65	Pink Kids
		27	HBO Adria	41	FTV			66	Pink M
								67	Pink Movies
								68	Pink Music
								69	Pink Plus
								70	Kanal A
								71	POP TV
								72	SportKlub Slovenija
								73	TV Pika
								74	TV3 Slovenia

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Simulcrypt

- What is simulcrypt?
- Simulcrypt is exactly what it sounds like - simultaneous encryption in multiple formats.
- Main purpose of simulcrypt is to spare bandwith on satellite.
- Gives provider the opportunity to increase his viewer base by cooperating with other operators.
- In this moment, 22 channels are being taken over from other operators (iTV Partner, Pink and STN)
- Also, 7 channels are being delivered to iTV Partner

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Simulcrypt block diagram

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Slide 27
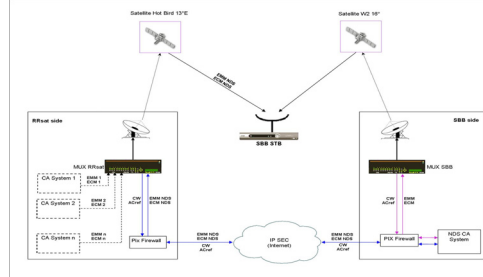
SBB – Regional DTH Operator

Total TV - BiH

- SBB has installed equipment in Banjaluka and Sarajevo in order to contribute signal of Bosnian TV cannels to Belgrade headend.

- Multiplexing equipment is placed in ATV master studio in Banja Luka from where is sent over 20 Mb/s L2 VPN link to Belgrade headend.

- Fiber optical link from RTRS studio to ATV master (iLynx BB encoder/decoder).

- FTV and Alfa TV signals are encoded at studios and sent over IP from Sarajevo to ATV master in Banja Luka

- All equipments in Banjaluka and Sarajevo are remotely controlled and monitored from Belgrade

- Existing satellite contribution over Express A3 will be terminated soon.

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Total TV - BiH block diagram

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Slide 29
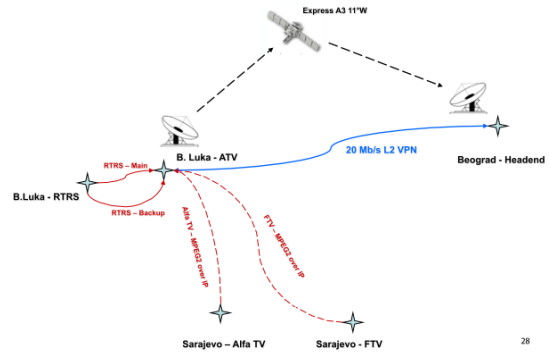
Total TV - Slovenija

- 5 TV services are being taken over simulcrypt connection.

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Slide 30
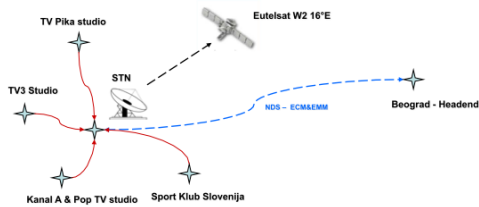
SBB Digital TV Cable - D3 service
(DVB-C)

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D3 service (DVB-C)

- System configuration is equivalent as DVB-S platform for Total-TV service

- CA system is configurated with the same SI on the both, DVB-C and DVB-S. The same smart-card type has possibility to be used in the both systems.

- 40 Pay-TV channels and 55 Bonus channels

- We are using 10 RF frequencies, modulation 64-QAM for Pay-TV and 256-QAM for Bonus channels.

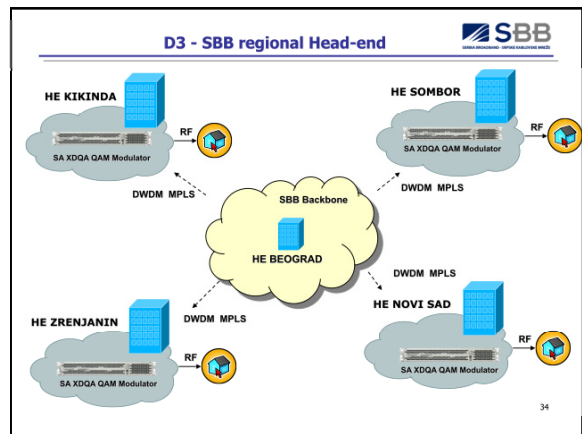- Satelite channels: transmiting in primary quality, without statistical multiplexing

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D3 – Block diagram

32
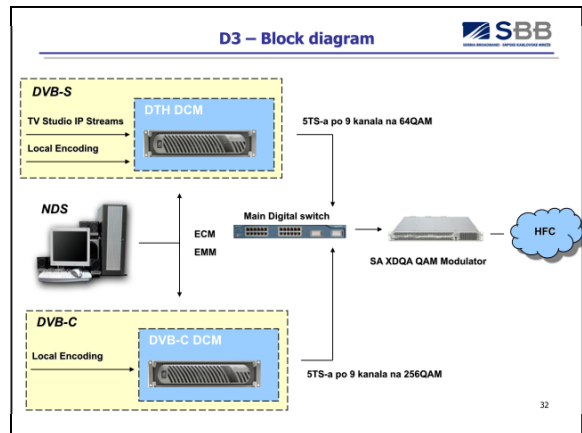
D3 - SBB regional Head-end

- Optical connection of the regional Head-ends in Vojvodina with Belgrade Head-end

- D3 service in Novi Sad, Kula, Vrbas, Vrsac, Sombor and Kikinda

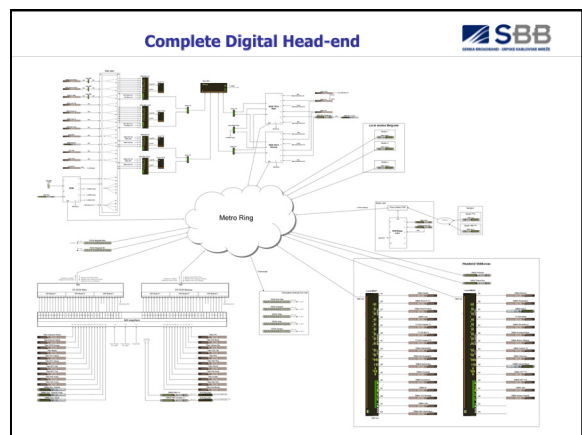- Total IP stream 450 Mbit/s.

- Transport over DWDM-MPLS

D3 - SBB regional Head-end

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D3 - SBB regional Head-end

- D3 service starting in Kragujevac, Krusevac and Nis at the beginning of 2009.
- Transport will be based on the leased STM lines from Telekom Srbija

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Complete Digital Head-end

THE END