

SI/EPG For Digital Broadcasting Receiver

SI/EPG For Digital Broadcasting Receiver



Heikan Izumi

MITSUBISHI ELECTRIC CORPORATION

SI/EPG For Digital Broadcasting Receiver

AGENDA

- Overview of SI
- ARIB SI
- Studio Systems
- Receiver Systems
- BS Digital Broadcasting Services

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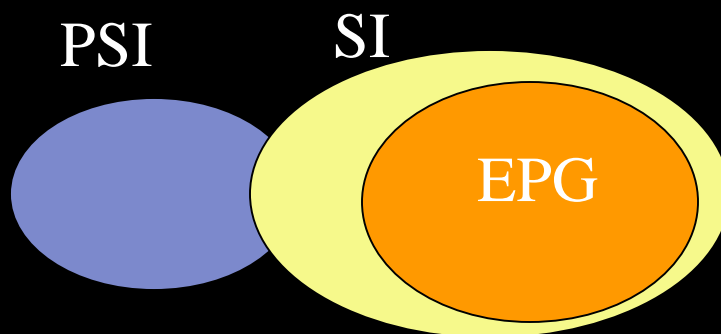
SI/EPG For Digital Broadcasting Receiver

Overview of SI

SI : Service Information

EPG : Electronic Program Guide

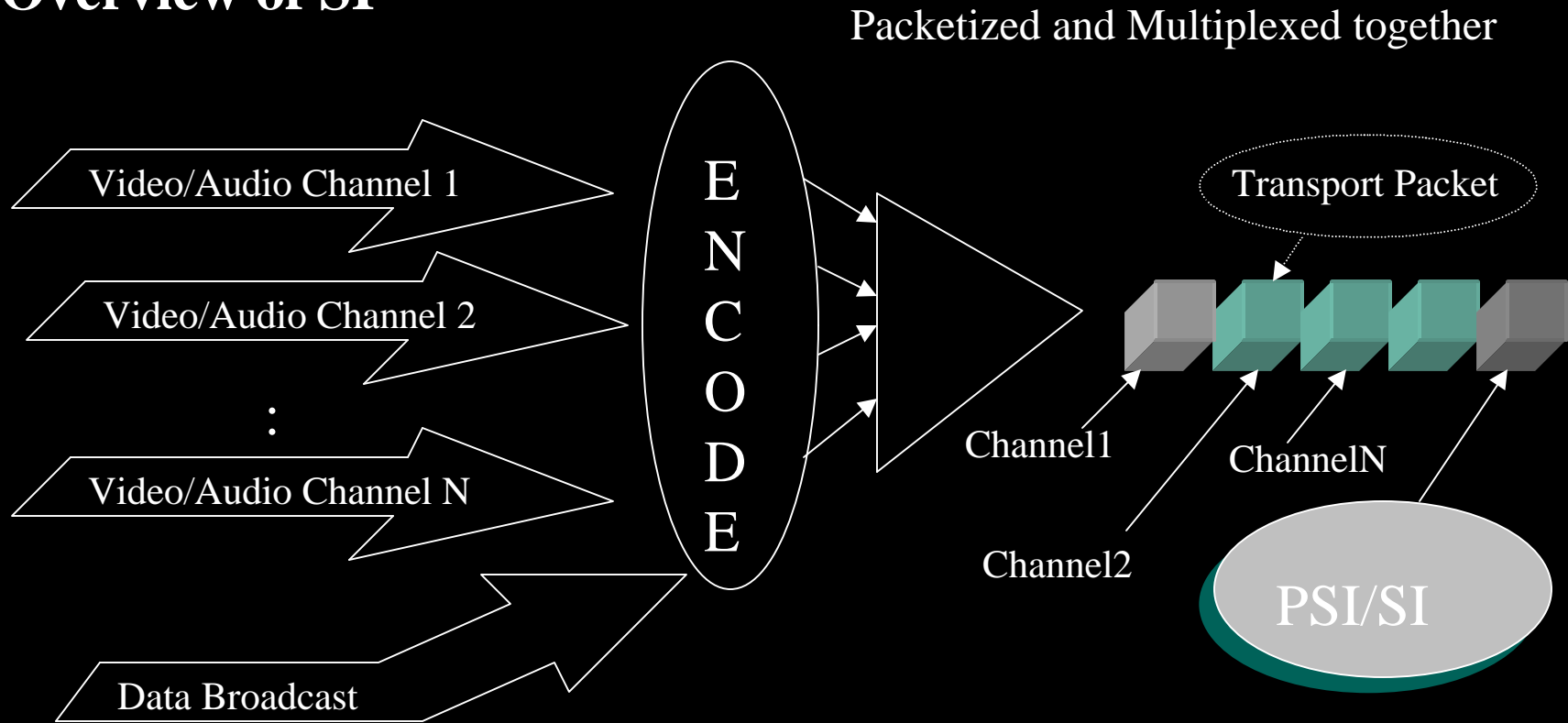
PSI : Program Specific Information



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Overview of SI

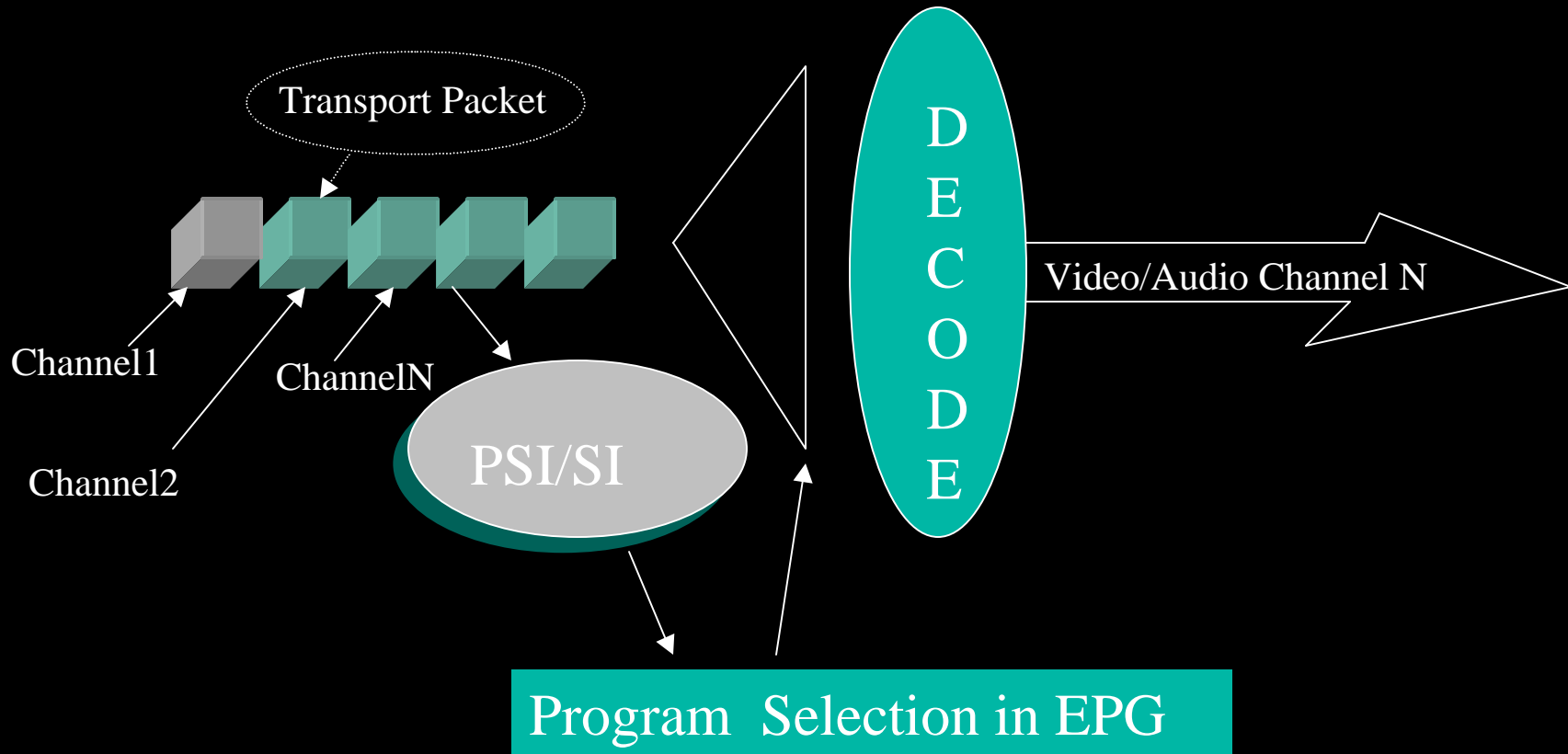


PROGRAM MULTIPLEXING

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Overview of SI



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SI Standard

ARIB

- ARIB STD-B10
- ARIB TR-B15

DTV

- Specification for Service Information in Digital Video Broadcasting systems

ATSC

- ATSC Standard A65
Program and System Information Protocol For Terrestrial Broadcast And Cable (PSIP)

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ARIB SI

- ARIB STD-B10

[Service Information For Digital Broadcasting System]

September 1997 Ver. 1.0

July 1998 Ver. 1.1

May 1999 Ver. 1.2

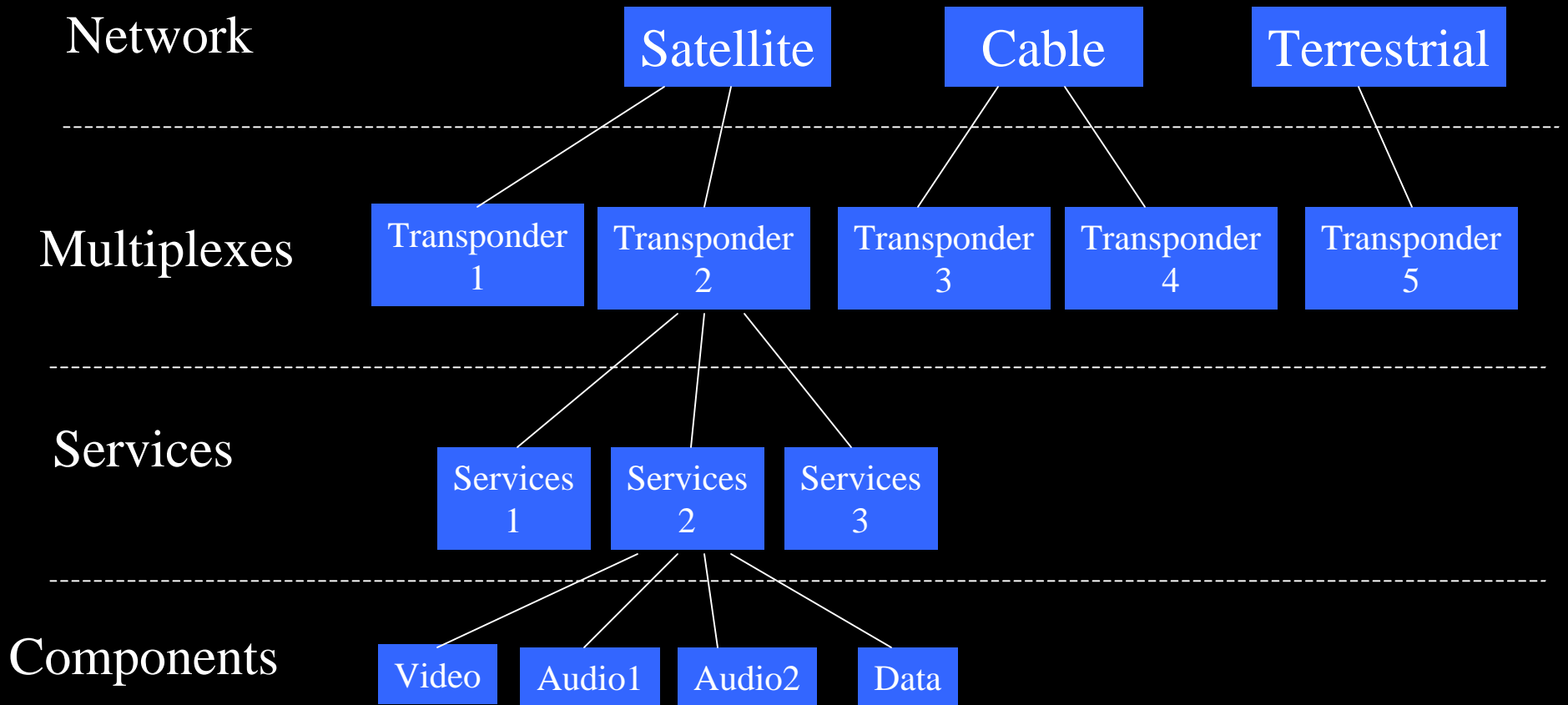
- ARIB TR-B15 Part2 Section4

[PSI/SI Operational Guideline]

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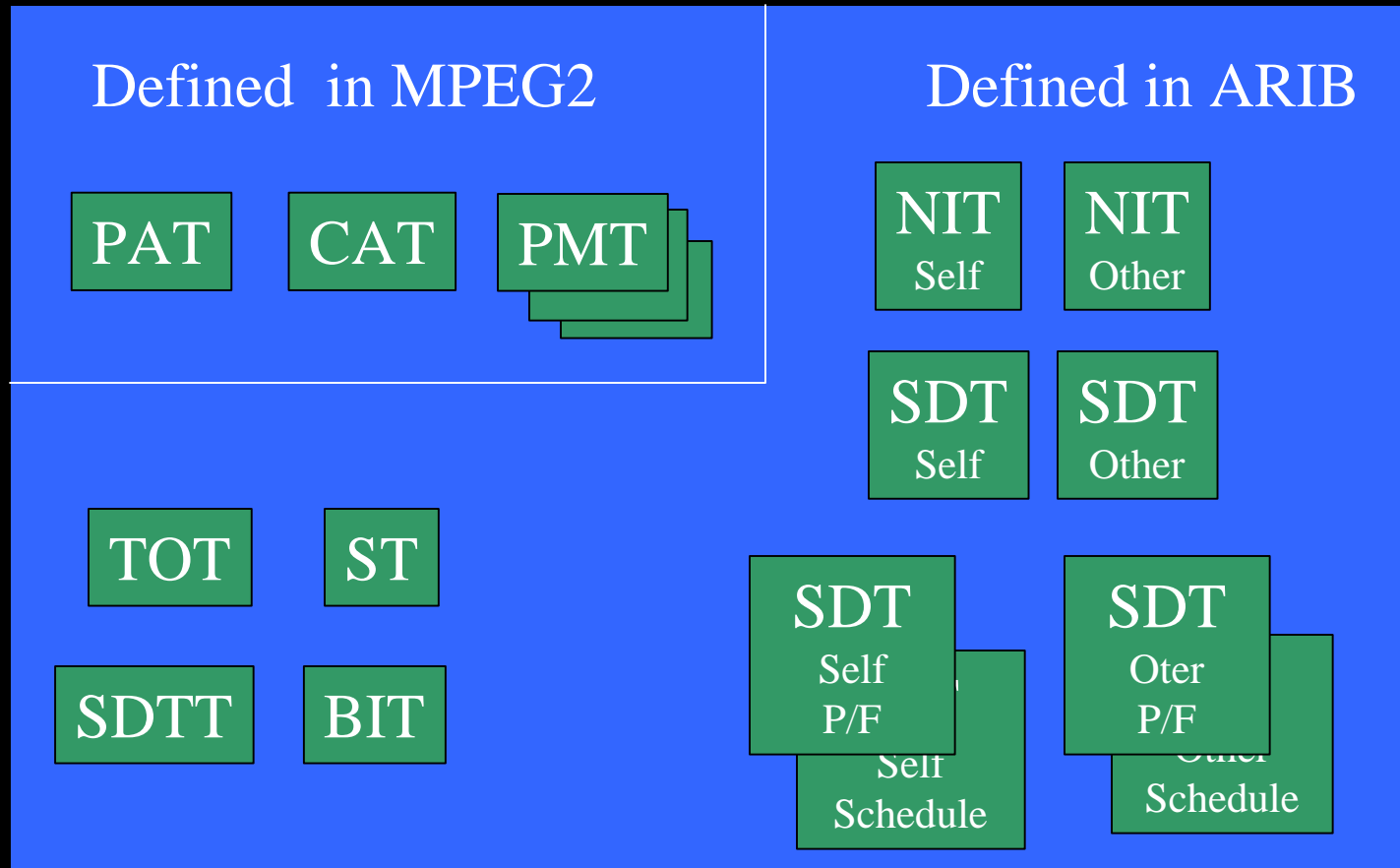
ARIB SI



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ARIB SI



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SOURCE_ID	SOURCE_NAME	PROGRAM SCHEDULE				
		6: 00PM	6: 30PM	7: 00PM	7: 30PM	...
x0053	ESPN1	FOULS & BLOOPERS	SCORE UPDATES	BOXING		...
x0072	NBC	SEINFELD	FRAISER	7: 00 NEWS	LOCAL NEWS	...
x0426	CNN	FINANCIAL NEWS	WORLD REPORT	TRAVEL SIGHT & SCAND		...
x0089	ABC	FOOTBALL				...
x1537	ESPN2	PGA TOURNAMENT		SPOTLIGHT: MICHAEL JORDAN		...
x8440	FOX	MARRIED WITH CHILDREN	FRIENDS	SIMPSONS	THE CRITICS	...
x0041	CBS	LOCAL NEWS	WORLD NEWS	MOVIES SPECIAL		...
x0955	HBO	MR. BEANS		UFO SIGHTINGS		...
...

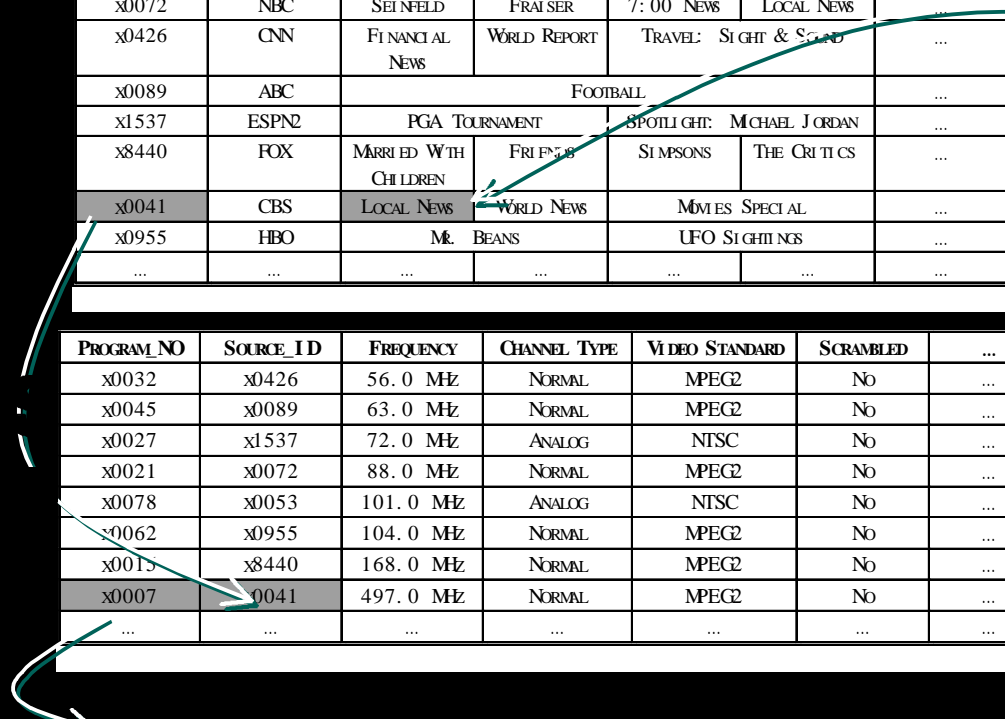
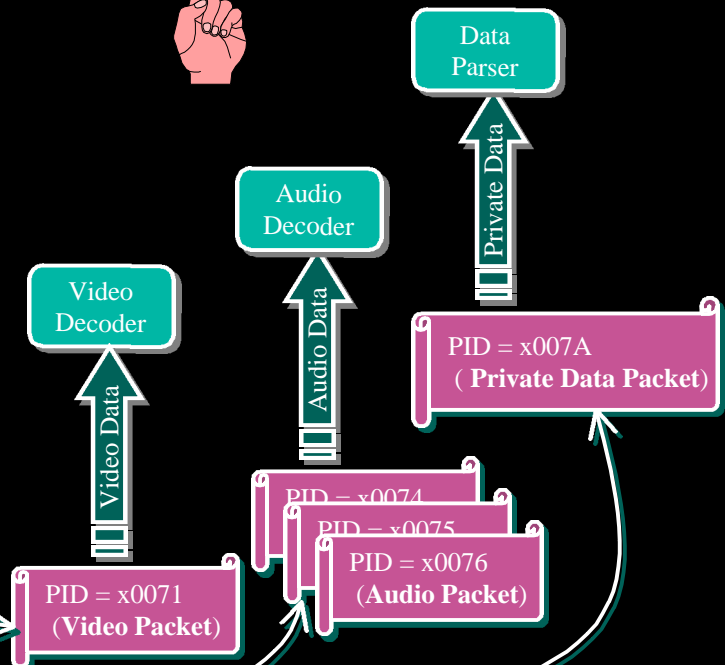
User Selected Program to Watch



PROGRAM_NO	SOURCE_ID	FREQUENCY	CHANNEL_TYPE	VIDEO STANDARD	SCRAMBLED	...
x0032	x0426	56.0 MHz	NORMAL	MPEG2	No	...
x0045	x0089	63.0 MHz	NORMAL	MPEG2	No	...
x0027	x1537	72.0 MHz	ANALOG	NTSC	No	...
x0021	x0072	88.0 MHz	NORMAL	MPEG2	No	...
x0078	x0053	101.0 MHz	ANALOG	NTSC	No	...
x0062	x0955	104.0 MHz	NORMAL	MPEG2	No	...
x0015	x8440	168.0 MHz	NORMAL	MPEG2	No	...
x0007	x0041	497.0 MHz	NORMAL	MPEG2	No	...
...

PROGRAM_NO	PROGRAM_MP_PID	...
x0007	x0070	...
x0015	x0150	...
x0021	x0210	...
x0027	x0270	...
x0032	x0320	...
x0045	x0450	...
x0062	x0620	...
x0078	x0780	...
...

PID	PROGRAM_NO	STREAM_TYPE	VIDEO_PID	AUDIO_PID(S)	PRIVATE_DATA_PID(S)	...
x0070	x0007	MPEG2	x0071	x0074 x0075 x0076 ...	x007A



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Table_id	Table	Transmit Level	Transmit Rate
0x00	PAT	Necessary	At least 1time/10 ms
0x01	CAT	Necessary	At least 1time/1 s
0x02	PMT	Necessary	At least 1time/100 ms
0x40	NIT(Self)	Necessary	At least 1 time/10 s
0x41	NIT(Other)	Optional	At least 1 time/10 s
0x42	SDT(Self)	Necessary	At least 1 time/2 s
0x46	SDT(Other)	Optional	At least 1 time/10 s
0x4A	BAT	Optional	At least 1 time/10 s
0x4E	EIT(Self Preset/Following)	Necessary	At least 1 time/2 s
0x4F	EIT(Other Preset/Following)	Optional	At least 1 time/10 s
0x50 – 0x5F	EIT(Self Basic) EIT(Self Extended)	Optional	At least 1 time/10 s At least 1 time/30 s
0x60 – 0x6F	EIT(Other Basic) EIT(Other Extended)	Optional	At least 1 time/10 s At least 1 time/30 s
0x70	TDT	Necessary	At least 1 time/30 s
0x71	RST	Optional	Optional
0x72	ST	Optional	Optional
0x73	TOT	Necessary	At least 1 time/30 s
0xC2	PCAT	Optional	Optional

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Descriptors in ARIB SI (STD-B10)

Conditional Access
descriptor

Network Name
descriptor

Service List descriptor

Stuffing descriptor

Satellite delivery
descriptor

Service descriptor

Short Event descriptor

Extended Event
descriptor

Component descriptor

Stream Identifier
descriptor

Content descriptor

Parental Rate
descriptor

Local Time Offset
descriptor

Hyper Link descriptor

Hierarchical
Transmission
descriptor

Digital Copy
descriptor

Audio Component
descriptor

Target Area descriptor

Data Content
descriptor

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Descriptors in ARIB SI (STD-B10) Continued

Video Decode
descriptor

Download Content
descriptor

CA EMM TS
descriptor

System Management
descriptor

CA Contract Info
descriptor

CA Service descriptor

Emergency
Information descriptor

Data Component
descriptor

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Descriptors in ARIB SI(TR-B15)

SI Parameter
descriptor

Event Group
descriptor

Series descriptor

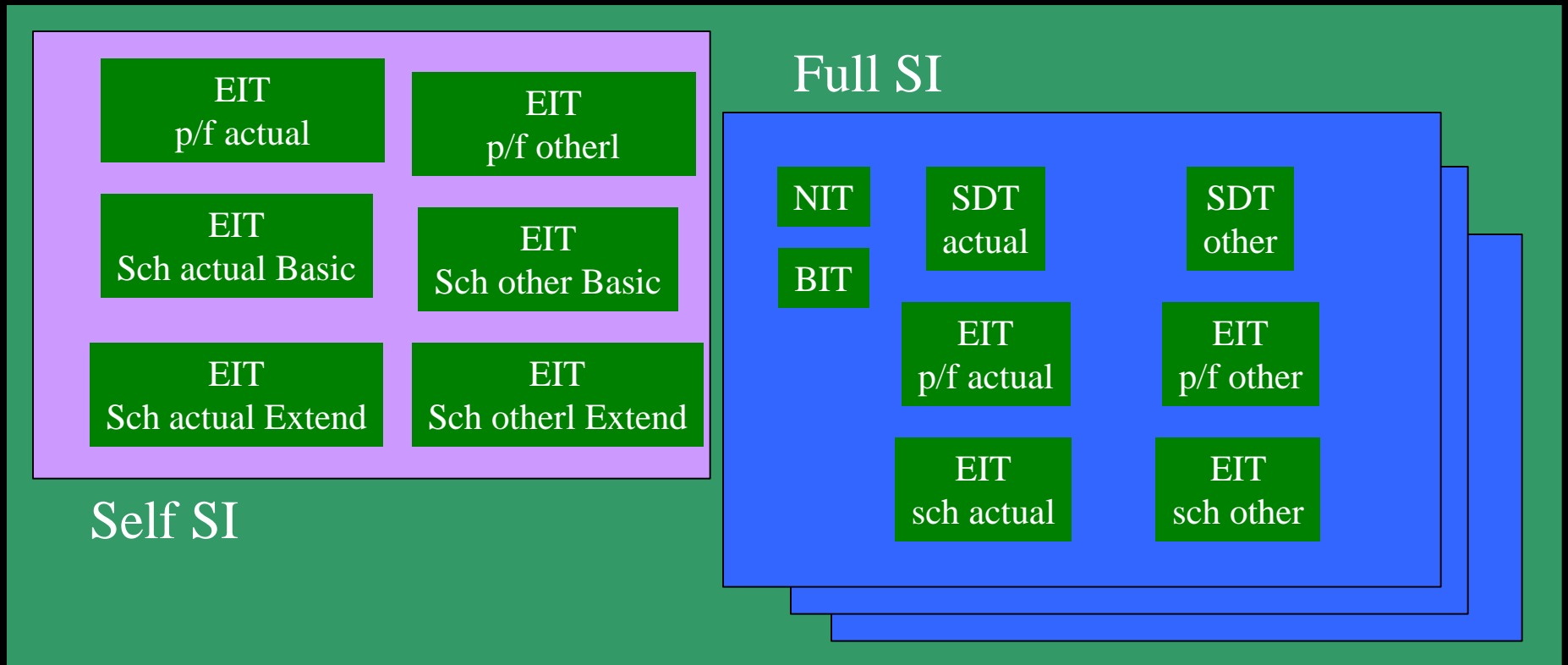
Broadcaster Name
descriptor

Component Group
descriptor

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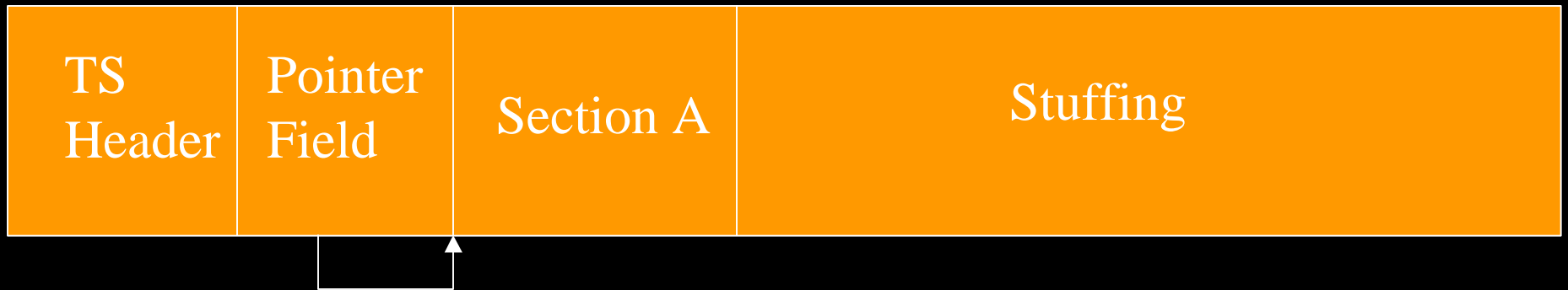
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Full SI and Self SI

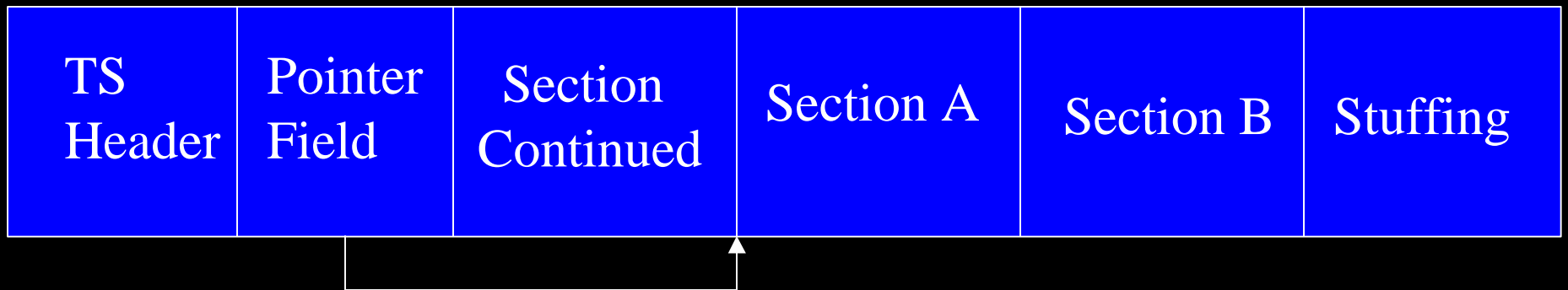


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Multi-section Transmission

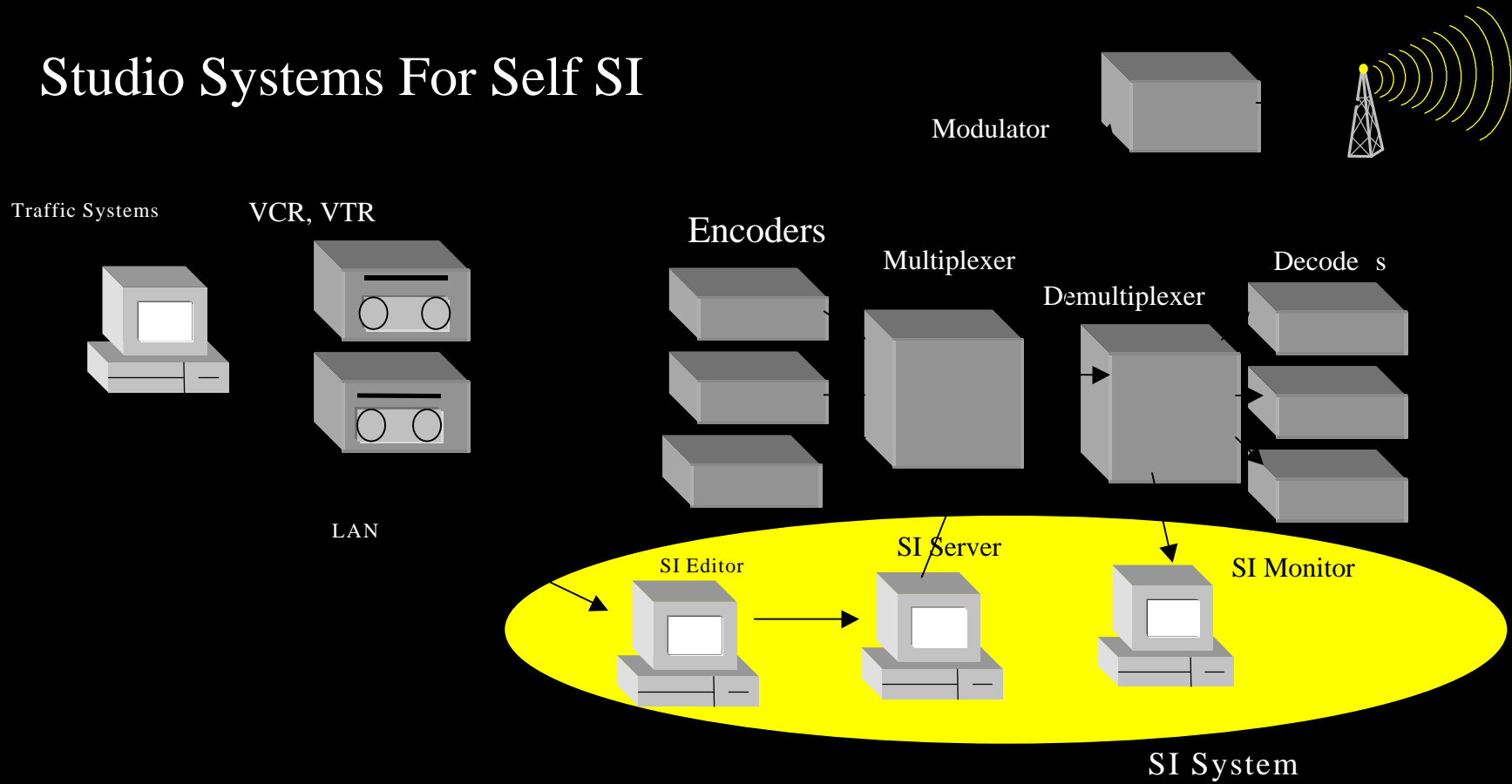


Multi-section Transmission



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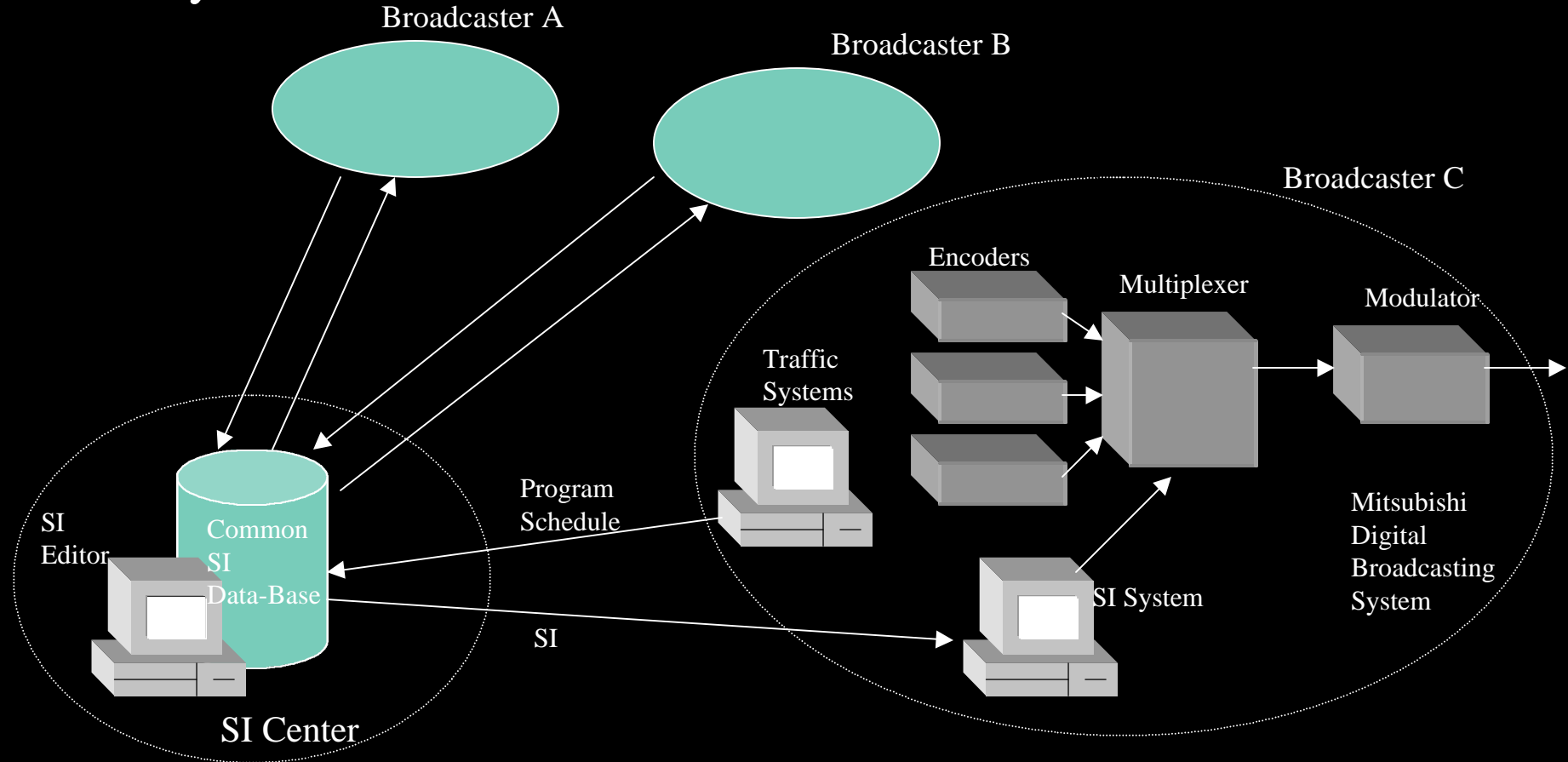
Studio Systems For Self SI



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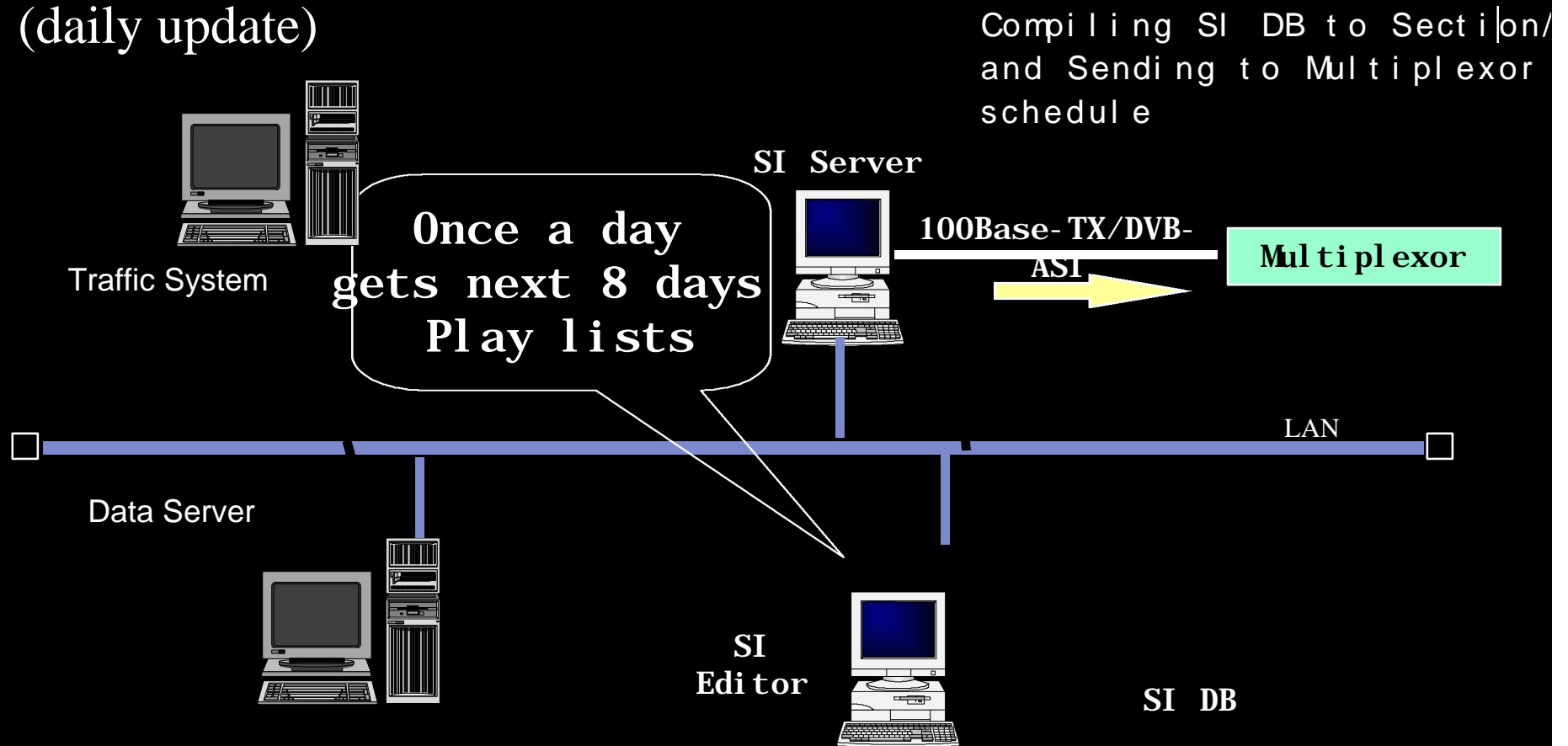
Studio System For Full SI



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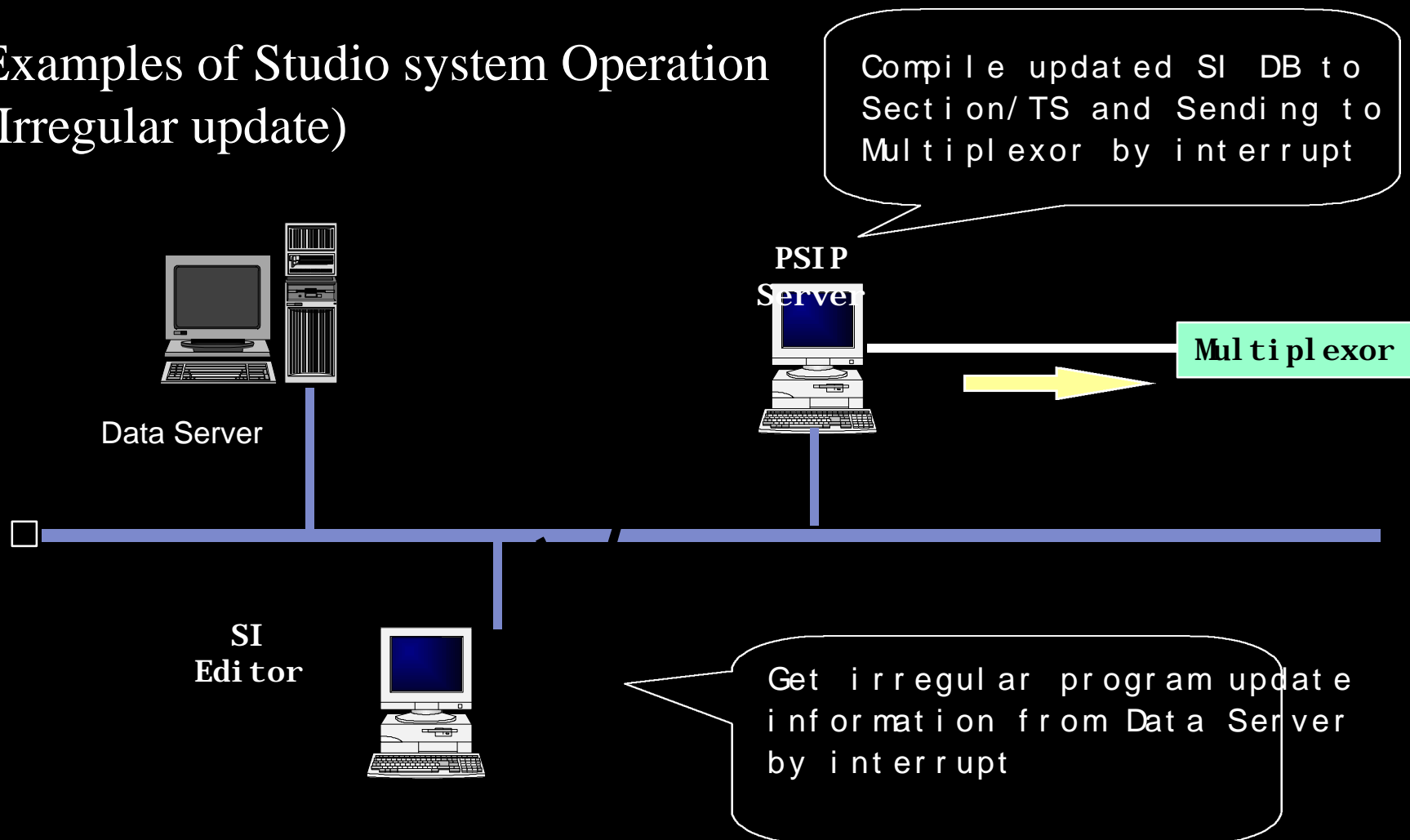
Examples of Studio system Operation (daily update)



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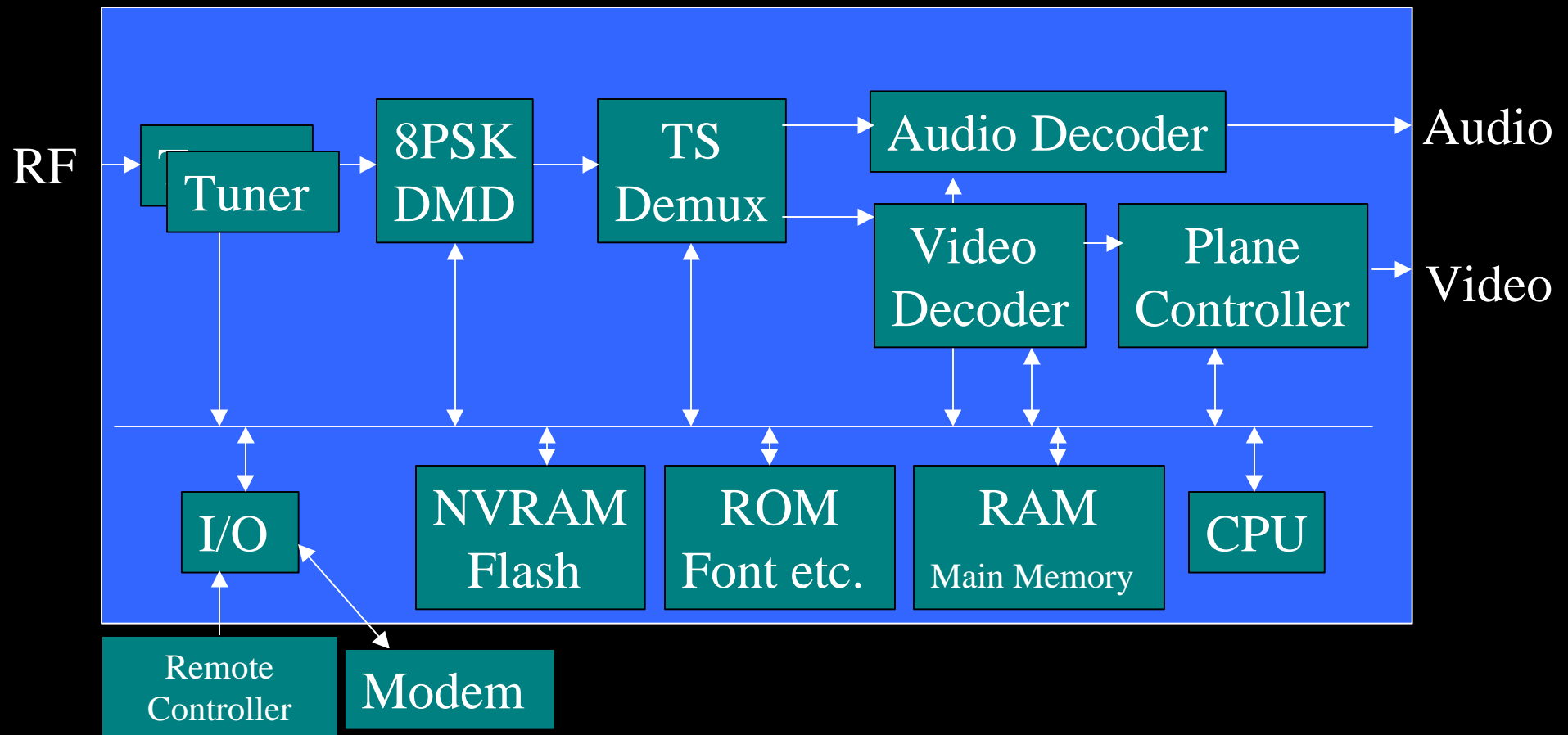
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Examples of Studio system Operation (Irregular update)



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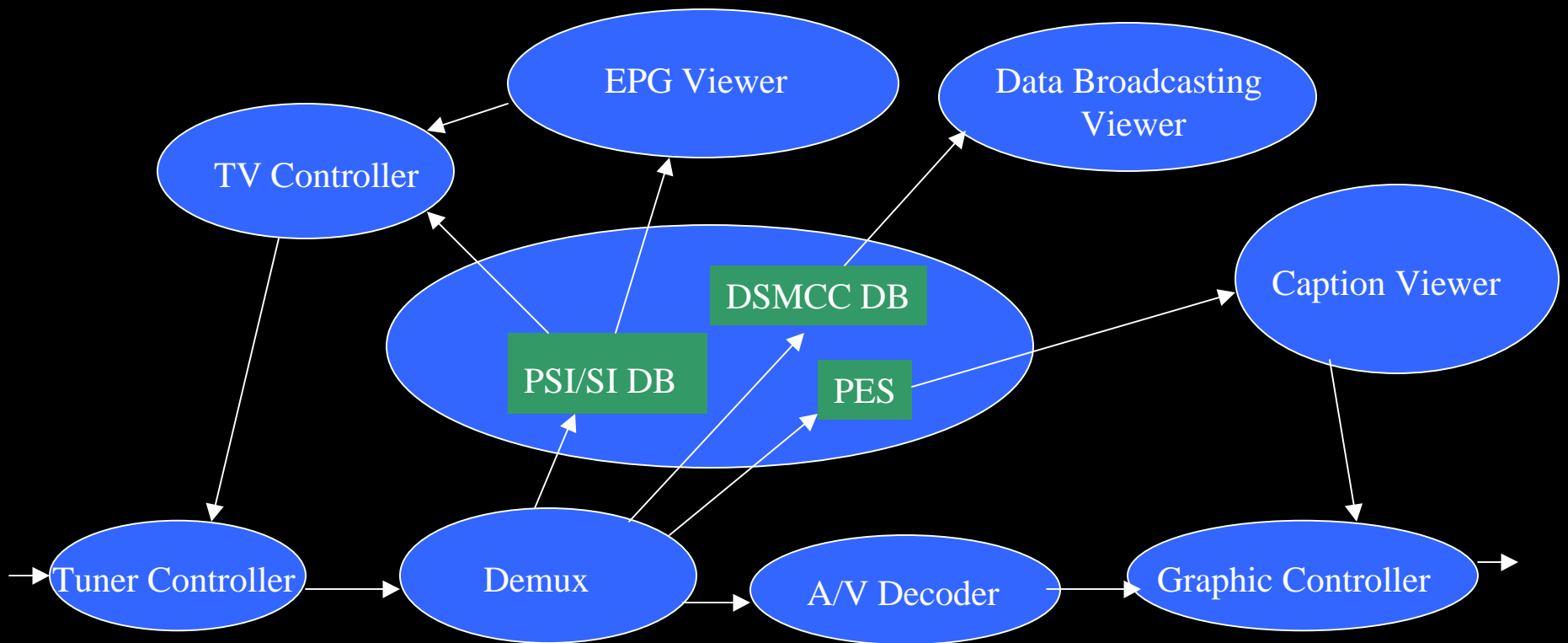
Receiver Systems



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Receiver Systems



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BS Digital Broadcasting Services

HDTV Broadcasters

NHK HiVision	BS Nittere	BS ASAHI	BS-i
BS JAPAN	BS FUJI	WOWOW	

SDTV Broadcasters

NHK BS-1	NHK BS-2	Star Channel
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Audio Broadcasters(TV Broadcasters)

BS Nippon	BS ASAHI	BS-I
BS JAPAN	BS FUJI	WOWOW

Audio Broadcasters

BSC	Music Bird	JNF	St.Giga
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Data Broadcasters(TV Broadcasters)

NHK	BS Nittere	BS ASAHI	BS-I
BS JAPAN	BS FUJI	WOWOW	Star channel

Data Broadcasters(Audio Broadcasters)

BSC	Music Bird	JNF	St.Giga
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Data Broadcasters

Megaport	Weather News	Digital Cast International	
Nippon Data	BS955	Nippon Media Ark	Nippon BS

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