

NTA 2008

# PSIP

Program System Information Protocol

What is it and why is it important?

**LARCAN**  
We hear you. Loud and clear.

Scott Barella - LARCAN

VP Technology/Bus. Development

# Definition

- **Program System Information Protocol**
  - Aka SI - "service information"
  - ATSC A/59
- **Provides essential information**
  - MPEG table assignments
  - Time of Day
  - Program Guide Info
  - Caption Service
  - Content Advisories
  - Support for Multilanguage

# PSIP provides essential info



## Critical Role:

- Tuning
- Channel Branding
- Program Promotion
- Program Guide
- Language Tracks
- Closed Captioning
- "V-Chip" information
- Broadcast Flag

# MPEG Basics

- Video/Audio/Data together = Transport Stream (TS)
- TS broken down by Packet ID's (PID)
- Each PID contains specific information regarding the TS

# ATSC DTV TS

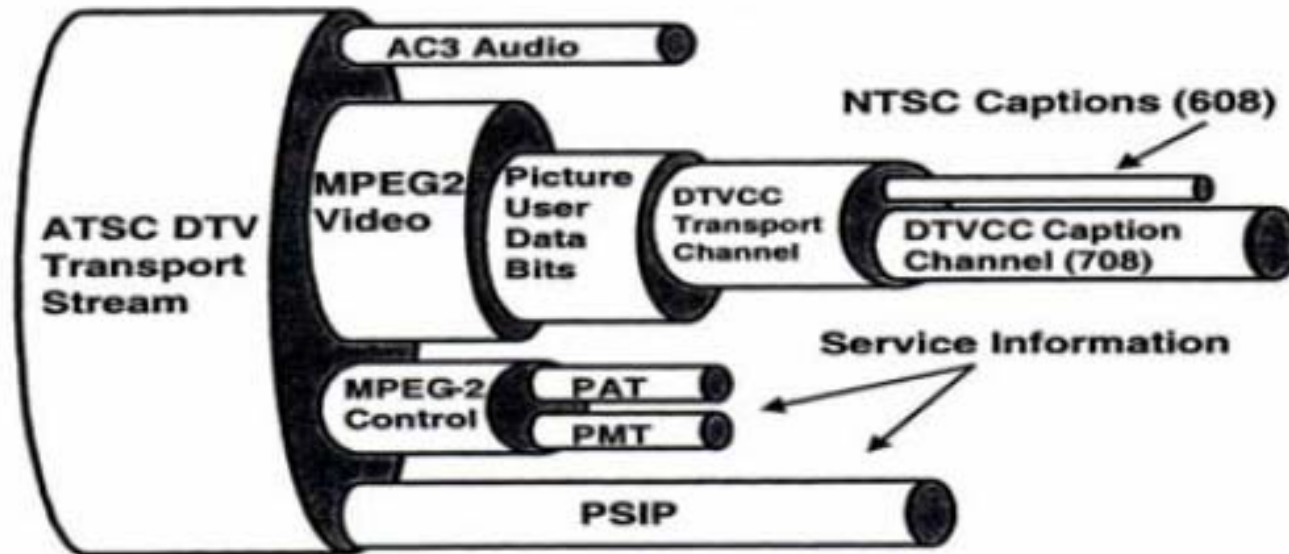


Figure 1 – Structure of the ATSC Transport Stream

# Essential PID's

- PAT

- Program Association Table
- Table of Contents analogy
- Always 0x000 (Hex) 0 (Decimal)
- Without PAT, nothing can be decoded

- PMT

- Program Map Table
- First channel usually 0x030 (Hex) 48 (Dec)

# Other Important PID's

- PCR
  - Program Clock Reference
  - Always the same as Video PID
  - Assures proper clock reference to video
- Video PID
  - First video channel begins at 0x031, next at 0x041, 0x051
- Audio PID
  - Must be Dolby AC-3
  - First audio channel begins at video +3 - 0x034, 0x044, 0x54

# TVCT

- Terrestrial Virtual Channel Table
- Within PID 0x1FFB (Hex) 8187 (Dec)
- Defines channels
  - Major Channel
  - Minor Channel
  - TSID Assignment - Transport Stream ID
  - Program number
  - Program descriptors

# TSID

- FCC TSID Table\*

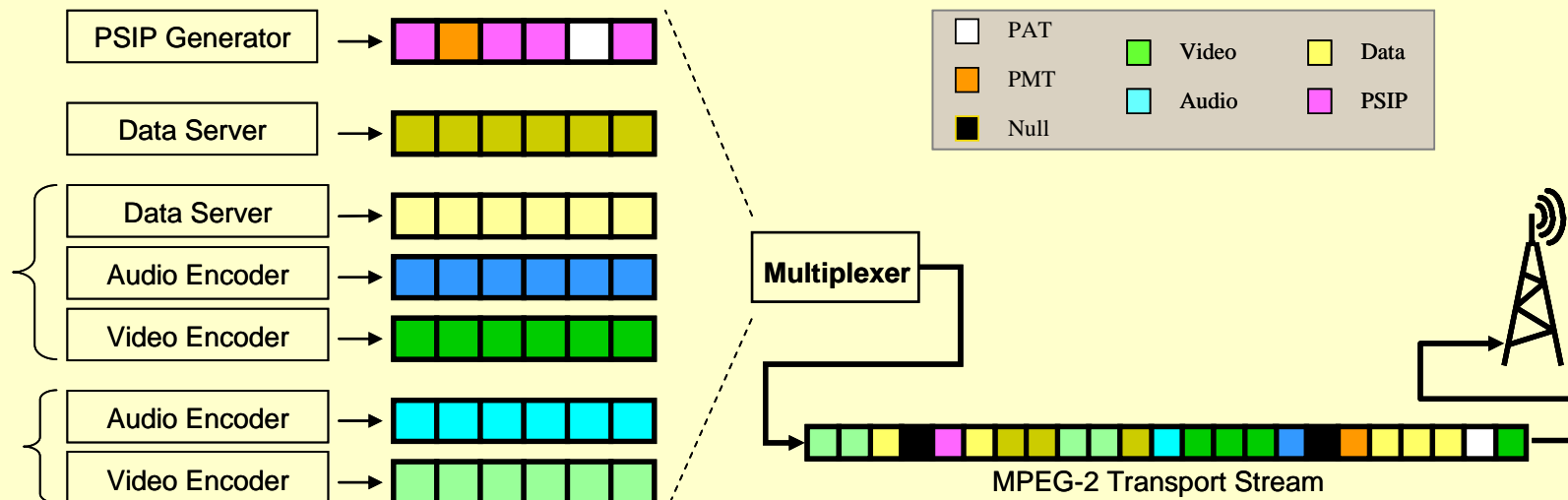
440	0x01B8	441	0x01B9	CA	WATSONVILLE	25	58
442	0x01BA	443	0x01BB	CO	BOULDER	14	15
444	0x01BC	445	0x01BD	CO	BROOMFIELD	12	38
446	0x01BE	447	0x01BF	CO	CASTLE ROCK	53	46
448	0x01C0	449	0x01C1	CO	COLORADO SPRING	11	10
450	0x01C2	451	0x01C3	CO	COLORADO SPRING	13	24
452	0x01C4	453	0x01C5	CO	COLORADO SPRING	21	22
<hr/>							
456	0x01C8	457	0x01C9	CO	DENVER	4	35
<hr/>							
460	0x01CC	461	0x01CD	CO	DENVER	7	17
462	0x01CE	463	0x01CF	CO	DENVER	9	16
464	0x01D0	465	0x01D1	CO	DENVER	20	19
466	0x01D2	467	0x01D3	CO	DENVER	31	32
468	0x01D4	469	0x01D5	CO	DENVER	41	40
470	0x01D6	471	0x01D7	CO	DENVER	50	51
472	0x01D8	473	0x01D9	CO	DENVER	59	43
474	0x01DA	475	0x01DB	CO	DURANGO	6	15
476	0x01DC	477	0x01DD	CO	FORT COLLINS	22	21
478	0x01DE	479	0x01DF	CO	GLENWOOD SPRING	3	23
480	0x01E0	481	0x01E1	CO	GRAND JUNCTION	4	15
482	0x01E2	483	0x01E3	CO	GRAND JUNCTION	5	2
484	0x01E4	485	0x01E5	CO	GRAND JUNCTION	8	7
486	0x01E6	487	0x01E7	CO	GRAND JUNCTION	11	12
488	0x01E8	489	0x01E9	CO	GRAND JUNCTION	18	17
490	0x01EA	491	0x01EB	CO	LONGMONT	25	29
492	0x01EC	493	0x01ED	CO	MONTROSE	10	13
494	0x01EE	495	0x01EF	CO	PUEBLO	5	42
496	0x01F0	497	0x01F1	CO	PUEBLO	8	26
498	0x01F2	499	0x01F3	CO	STEAMBOAT SPRIN	24	10
500	0x01F4	501	0x01F5	CO	STERLING	3	23

\* <http://www.mstv.org/docs/tsidupdate.pdf>

## Other Critical PID's

- MGT - Master Guide Table
  - Within 0x1FFB (Hex), 8187 (Dec)
  - Set top box table for all other PSIP tables
  - Defined in ATSC A/65
- STT - System Time Table
- RTT - Rating Region Table
- EIT - Event Information Table
- ETT - Extended Text Table

# PSIP multiplex



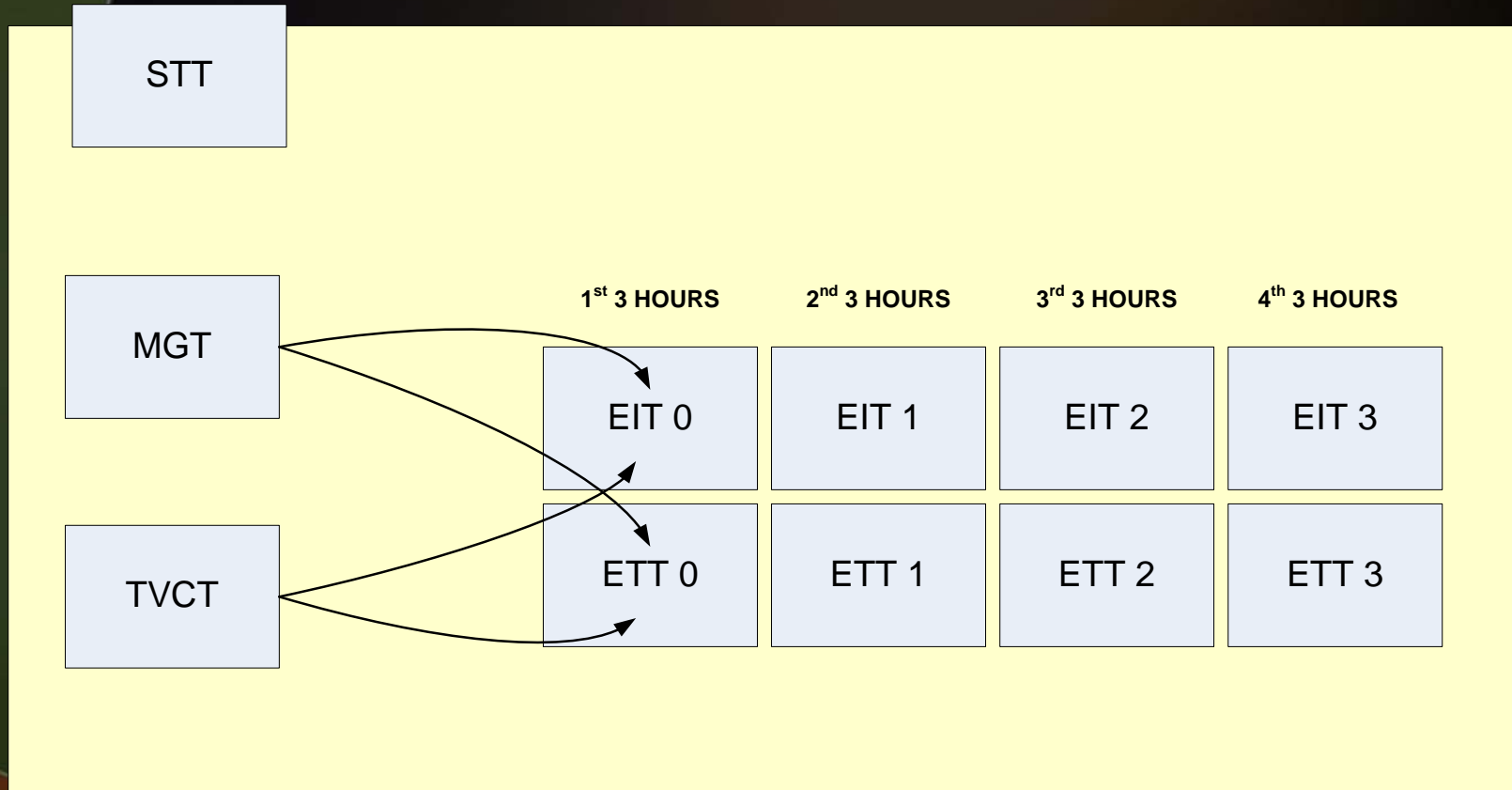
# PSIP Generator

- Generator used for PSIP PID generation
  - Triveni
  - Thales
  - DTV Innovation
- Generally sent as an ASI stream

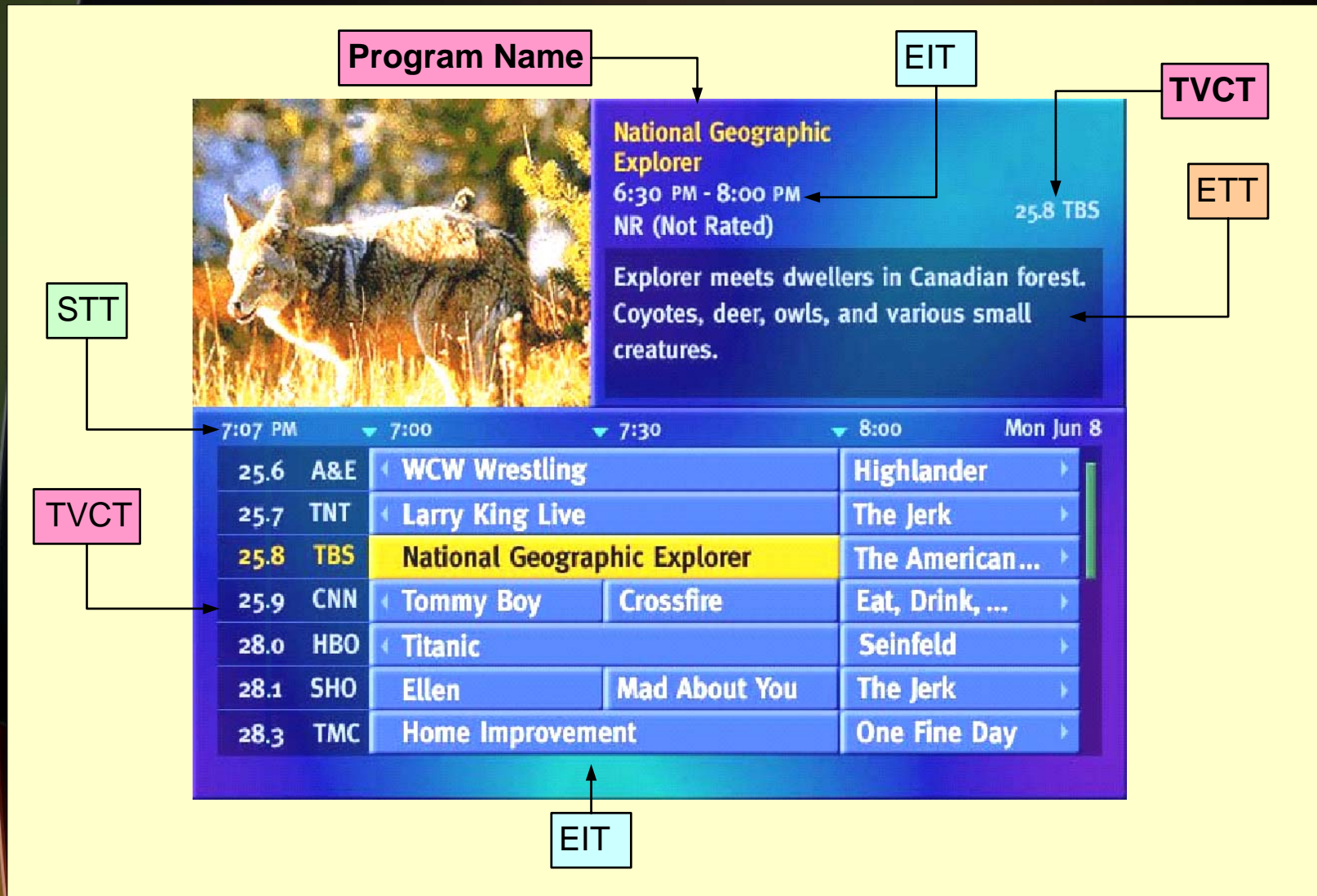
# PSIP Table Generation

- TVCT
- MGT
- RTT
- STT
- EIT
- ETT
  
- Optional PAT/PMT tables

# PSIP Table Data Generation



# Electronic Program Guide (EPG)



# PSIP Expectations

- Mandated for Full Power Stations
- Viewer expectations will be high
- Some Receivers will not properly decode ATSC stream without it
- Huge Promotional Opportunities

# NTA 2008

- Thanks!

- Scott Barella

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