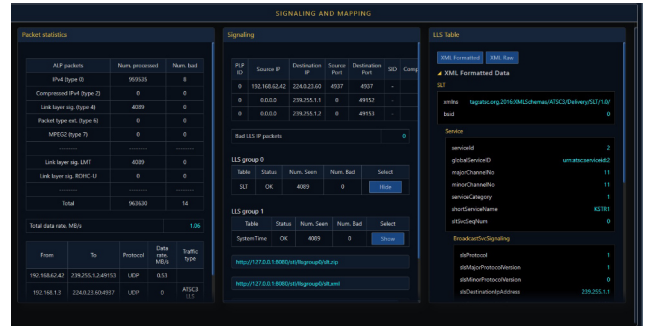


ACTIVECORE®

**AVQ1040
ATSC 3.0 STLTP ANALYZER**

FEATURES:

- ▶ **Spectrum and channel capacity monetization for Spectrum sharing and Datacasting applications**
- ▶ **Analysis, Monitoring, Troubleshooting, and Metering at every level of the Studio-to-Transmitter Link**



Description

AVQ1040 STLTP Analyzer is a powerful solution for ATSC 3.0 STLTP (ATSC A/342) Scheduler/Studio to Transmitter Link troubleshooting, analysis, monitoring and verification. AVQ1040 is available as a stand-alone software package, an embedded platform or as an option to Avateq's AVQ1022(gen. 2) RF Signal Analyzer. AVQ1040 allows verification of delivery protocols for ALP Transport at every level, including content scheduling and Physical Layer signaling.

The Analyzer also provides statistics of RF bandwidth and channels capacity utilization on per service basis that makes the Analyzer an indispensable tool for emerging applications, including spectrum share and datacasting that requires metering of the RF resource usage.

Measurements and Metrics

STLTP PAYLOAD PACKET DELIVERY STATISTICS:

- ▶ Ingress stream statistics for Tunnel and two-dimensional arrangement of ST 2022-1 ECC packets

SERVICES:

- ▶ Bit-rate and BW share for each PLP in RF channel;
- ▶ Payload traffic statistics;
- ▶ Payload and total data limit usage as a metered connection;
- ▶ ATSC 3.0 services with all details extracted from LLS and media components available as file downloads;
- ▶ ROUTE objects TSI/TOI, counters, and statistics;

NETWORKING DIAGNOSTIC CAPABILITIES:

- ▶ Relaying the ALP stream through UDP to a remote host;
- ▶ Capturing decapsulated IP packets to a *.pcap file.

ALP, LMT, and LLS MONITORING:

- ▶ ALP packet types and decapsulated IP traffic stream details;
- ▶ Link Mapping Table;
- ▶ Grouped LLS tables, available as plain XML or ZIP archives.

DELIVERY STATISTICS FOR OUTER TUNNEL, PREAMBLE, AND TIMING AND MANAGEMENT STLTP COMPONENT:

- ▶ Dropped packets, stream, and stream interruptions;
- ▶ UDP, RTP inner errors;
- ▶ Packet re-assembling and sequence errors.

ATSC 3.0 FRAME PREAMBLE AND TIMING AND MANAGEMENT CONTENT INCLUDING DETAILS FOR:

- ▶ L1 signaling and Exciter configuration;
- ▶ Transmitter synchronization, Phy Layer frame identification, TxID, etc.

Applications

STUDIO-TO-TRANSMITTER LINK ANALYSIS:

- ▶ **STLTP traffic decapsulation and monitoring**
 - Outer STL tunnel, Preamble, Timing and Management, and per-PLP baseband stream components;
 - Sequence number monitoring, packet loss statistics, approximate data rates, stream locks, and common errors reporting;
 - Alarm notifications on stream unlock, packet loss, or exceeding data rate limits.
- ▶ **STLTP FEC support**
 - Current FEC scheme (Rows x Columns) reporting;
 - FEC packet recovery rate, as observed by the software;
 - Packet loss, reordering, duplication rate reporting.
- ▶ **Payload content extraction and accessing at all layers of the STL stack**
 - Preamble and Timing / Management content;
 - ALP statistics: types of packets seen, bad packet counters, total data rate;
 - LMT signaling details;
 - Media stream packet statistics: IP addresses and ports, types of

- traffic seen;
- LLS tables available for download as zip or plain XML;
- ATSC3 Services table with details extracted from LLS;
- Media segment statistics for the selected Service: data rates per component, TSI/TOI, ROUTE object counters and continuity monitoring;
- Live streaming of the selected ATSC3 Service through local DASH/ HTTP server;
- All ROUTE/DASH components are downloadable as files.

STLTP AS A METERED CONNECTION

- ▶ Per-Service payload data rate monitoring, accumulating total payload counters.
- ▶ Ideal PLP payload throughput, actual per-Service PLP load percentage and RF BW share.
- ▶ Per-Service PLP usage monitoring: configurable Min/Max limits, Min-Only, Max-Only or Min-Max monitoring mode.
- ▶ Alarm notifications when a Service exceeds set PLP bandwidth percentage limits.

AVQ1040 ActiveCore® ATSC 3.0 STLTP ANALYZER

DATASHEET

Samples of Reported Parameters

Ingress multicast streams

FEC columns (L)	8
FEC rows (D)	8
FEC recovery rate, pkt/s	0

Ingress stream statistics

Stream	Data rate, kb/s	Drop rate, pkt/s	Reordering rate, pkt/s	Duplication rate, pkt/s	Loss rate, pkt/s
239.0.199.51:30000	4899	0	0	0	0
239.0.199.51:30002	620.26	0	0	0	0
239.0.199.51:30004	619.72	0	0	0	0

STLTP components

Outer STLTP

Locked to stream	Yes
Total dropped (errors)	0
Stream interruptions	2
Internal errors	0
Sequence num. gaps	2
Payload reassembling errors	0
Total dropped inner (errors)	0
Bad IP inner	0
Fragmented IP inner	0
Bad UDP inner	0
Bad RTP inner	0

Preamble

Timing and management

PLP 0

PLP 1

PLP 2

Locked to stream	Yes
Total dropped (errors)	0
Stream interruptions	3
Internal errors	0
Sequence num. gaps	3
Payload reassembling errors	0

ATSC 3.0 SERVICES

PLPs

ID	Layer	LLS	Chband	B/W Share	Mb/sec	In Service
0	Core	Present	0	0.314	3.281	Selected
1	Core	Not present	0	0.312	4.393	Selected
2	Core	Not present	0	0.305	7.728	Selected

Services

Service payload traffic statistics

Service name	Payload total, kb	Payload rate, kb/s	PLP ID	PLP throughput, kb/s	PLP usage, %	Is monitored	Is alarm
KOMO	12271340	1214.75	1	549.23	221.1		
KIRO	2228268	2195.45	2	966.05	207.2		
ESG	1136507	112.43	1	549.23	24.4		
KUNS	9152024	904.8	0	410.24	220.5		

Service payload monitor settings

ESID	Service ID	Monitoring mode	Min. PLP %	Max. PLP %	
0	0	Min-Max PLP usage	1	99	Add

Available services

LLS Group ID	ESID	Service ID	Name	Category	Protocol	SLS PLP	Selected
1	3103	5002	KOMO	Linear A/V	ROUTE	1	Unselect
1	3103	5003	KIRO	Linear A/V	ROUTE	2	Select
1	3103	5004	ESG	ESG (program guide)	ROUTE	1	Select
1	3103	5005	KUNS	Linear A/V	MMFP	0	

ATSC 3.0 SERVICES

Services

Available services

LLS Group ID	ESID	Service ID	Name	Category	Protocol	SLS PLP	Selected
1	3103	5002	KOMO	Linear A/V	ROUTE	1	Unselect
1	3103	5003	KIRO	Linear A/V	ROUTE	2	Select
1	3103	5004	ESG	ESG (program guide)	ROUTE	1	Select
1	3103	5005	KUNS	Linear A/V	MMFP	0	

Name	SLS Source IP	SLS Dest IP	SLS Dest port	GLB ID	Mp Ch	Micro Ch
KOMO	172.16.200.1	239.255.4.1	5001	tagsinclrplatform.com,2020KCOMD-3123	4	1

TSI	Source IP	Dest IP	Dest Port	PLP
100	172.16.200.1	239.255.4.1	5001	1
200	172.16.200.1	239.255.4.1	5001	1
201	172.16.200.1	239.255.4.1	5001	1
300	172.16.200.1	239.255.4.1	5001	1

ROUTE Objects

Name	TSI	TOI	Obj total	Obj bad	Obj missing	kb/s
fdl.xml	0	0	47541	0	0	1.75
slcbt	0	4653112	285246	0	0	42.08
weather-bitnet.pkg	1439	3	71290	0	0	9.62
Alert.pkg	1433	3	111535	0	0	9.35
weather-7day.pkg	1420	3	71250	0	0	9.57
App.pkg	1041	3	332700	0	0	48.31
d4-4-STOIS.m4s	300	803901863	11855	0	0	17179867980
d4-4-init.mpg4	300	1	11855	0	0	0.77
a1-a13_3-STOIS.m4s	201	803901864	83145	40	0	171798679840
a1-a13_3-init.mpg4	201	1	11855	0	0	0.78
a0-a02_2-STOIS.m4s	200	803901864	213752	40	0	171798679840
a0-a02_2-init.mpg4	200	1	11855	0	0	0.78
video-STOIS.mpg4v	100	803901864	6916880	40	0	171798679840

SIGNALING AND MAPPING

Packet statistics

Link layer sig. LMT	313033	0
Link layer sig. RCHC-U	0	0
Total	35707053	129
Total data rate, MB/s	4.45	

From	To	Protocol	Data rate, MB/s	Traffic type
172.16.200.1	239.255.51.15001	UDP	0.88	
172.16.200.1	239.255.70.15005	UDP	0.09	
172.16.200.1	224.0.23.60	UDP	0	ATSC3 LLS
172.16.200.1	239.255.71.15001	UDP	2.17	
172.16.200.1	239.255.4.15001	UDP	1.18	
172.16.200.1	239.255.51.15100	UDP	0.11	

Signaling

PLP ID	Source IP	Destination IP	Source Port	Destination Port	SID	Compr
0	0.0.0.0	224.0.23.60	0	4937	-	-
0	0.0.0.0	239.255.70.1	0	5005	-	-
0	0.0.0.0	239.255.51.1	0	5001	-	-
1	0.0.0.0	239.255.4.1	0	5001	-	-
1	0.0.0.0	239.255.51.1	0	5100	-	-
2	0.0.0.0	239.255.71.1	0	5001	-	-

Bad LLS IP packets: 0

LLS group 1

Table	Status	Num. Seen	Num. Bad	Select
SIT	OK	52282	0	Hide
SystemTime	OK	26119	0	Show

SIT

xmlns	tags	xmlnsSchema	ATSC3QDeliverySIT/1.0
bits	3103		

Service

serviceId	globalServiceID	tags	inclrplatform.com,2020KCOMD-3
5002			

stSvcSeqNum: 123

majorChannelNo: 4

minorChannelNo: 1

serviceCategory: KOMO

shortServiceName: KIRO

BroadCastSig: signaling

sitProtocol: 1

ALP over UDP streaming

Destination IP address: 224.0.1.1 [Set]

Destination UDP port: 4444 [Set]

Stream ALP over UDP: Off [Set]

Capturing

Capture IP traffic to file: Off [Set]

File size limit, MB: 50 [Set]

Capturing status: Stopped

SIGNALING AND TIMING

Preamble

LLS_S1_Deact_lic_type_mode	1
LLS_S1_Deact_addtional_garity_mode_E	0
LLS_S1_Deact_torv_ven	4897

Timing and Management

preamble_structure	25
num_mission_syn	0
eq_workloop	0
num_misrcs_in_group	0
intr_group_num	49
maj_log_override	0
num_misrcs_codes	0
ts_carrier_offset	0
pkt_ris_seconds	0
pkt_ris_a-milliseconds	43

Bootstrap timing

seconds	nanoseconds
1609411637	95466037

Per transmitter

trans_id	ts_time_offset	sid_injection_M	miss_fit_code_index
222	0	6	0

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