Service Quality Assurance for Digital Media Services

iTVSense RackProbe M-201 / M-301
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iTVSense RackProbes appliances deliver exceptional performance and accuracy for the most demanding IPTV and 3-Play service monitoring tasks. Deployed to the IPTV headend, these probes can analyze up to 1000 channels simultaneously, providing complete service assurance even for the broadest IPTV channel offerings with a single and small form factor device.

Benefits

With a measurement capacity of 5000 Mbits/sec, the M3xx probes are versatile measurement devices for multiple application scenarios, e.g.

- As full-service assurance probes in IPTV headends with more than 200 (M-201) or 1000 (M301) channels – depending on the model.
- As a monitoring probe for massive unicast traffic.
- At strategic locations in the providers core network
- In network aggregation points, i.e. on switch/router ports for monitoring backbone and aggregation routing and switching.

All this functions are delivered by a small 1U high rack-mounted device, with a moderate, 60W power rating.
Operation modes

Operation modes

iiTVSense probes may be operated under central control by an iiTVSense server, or in stand-alone mode, controlled primarily from the Web GUI.

Centralized Operation

Operated under central control, the probe communicates with the iiTVSense server environment for:

- Downloading measurement configuration as defined on the server.
- Serving the iiTVSense performance recording server with periodic minute-resolution data.
- Serving the iiTVSense GUI with 1-second resolution data for on-demand queries.
- Forwarding probe-generated alarms to be stored, analyzed, correlated, and eventually presented on the server GUI, or forwarded to umbrella managers.
- Storage of probe-generated data captures on the server.
- Generic system health monitoring and probe firmware upgrades provided by the server.

To make centralized operation and control possible, probes support several options to provide firewall-transparent access from the management server.

Standalone Mode and Web GUI

Probes in stand-alone mode are mostly operated through the Probe Web GUI, a sophisticated, dynamic and bandwidth-economic web application with the following main functions:

- Probe status overview: identification, system and network status, probe alarms, and measurements overview.
- Detailed measurement charts with
  - Selectable measurements and metrics
  - Selectable time resolution (1 sec - 4 hours)
  - Interactive zoom functions
  - Related alarms indicated on measurement charts.
- Setup screens for
  - Measurement settings
  - Alarm thresholds defined through profiles assigned to channels or streams.
  - Boot and network setting, including
    - full VLAN support on either interfaces,
    - VPN links to make probe accessible from other, firewall-separated networks
  - Technology specific setups, like IPTV channel definitions, Internet test server lists and/or VoIP peer lists.
- Additional Network and Diagnostic tools like
  - Selective or generic mode packet capture: captured data is uploaded to a network server in PCAP format. Selective captures only include single channels or directions, while generic mode includes all network data, with custom filter definitions supported.
  - DNS, Ping, HTTP availability tests
  - Probe ecosystem diagnostics.


**Technology Specific Features and Usage**

### iTVSense Probes used in IPTV

In an IPTV service environment, Probes provide the following main features:

- Measurement of up to 1000 channels (including SD and HD media of various encodings) simultaneously.
- Second-resolution metrics and minute-based aggregates of metrics like bitrate, packet loss, RFC 4445 MDI DF (delay factor), and MLR (media loss rate, a.k.a. “CC error”), PCR jitters and errors, and No Signal errors.
- 60 seconds resolution data storage for up to 540 hours and seconds-level storage for up to 72 hours.
- Alarm definition based on measured values. In addition to being displayed on the probe Web GUI, alarms may trigger:
  - syslog/snmp alerts sent to external systems (escalation)
  - automatic data capture enabled for the alarm period

### iTVSense Miniprobes Used for Internet services

- Internet access measurements: availability, utilization, average/maximum RTT.
- Basic internet service availability tests for DHCP, DNS, NTP, etc.
- Scheduled, periodic download/upload rate tests for selected servers.
  - These probes can also act as a target for tests initiated from other probes.
- Website and online service availability tests, including replays of simulated or recorded multi-step http/https transactions (like online shopping sessions including catalog, registration/login/logout shopping cart, ordering, payment, etc.)
Specifications

**NETWORK INTERFACES**
- 2x SFP+ sockets for up to 10Gbps SFP+ modules (M-301)
- 2x1 Gbps copper Ethernet interfaces (M-201, M-301)
- iLO management interface (M-201, M-301)

**MONITORED DATA:**
- Network UDP stream packet rate, byte rate, packet loss rate and various jitter metrics
- MPEG Transport Stream packet rates, jitter, packet loss, counter and encapsulation errors. Metrics are provided both as an aggregate and also by individual Mpeg streams (video, audio, control).
- RFC 4445 Media Delivery Index (MDI).
- Multicast join times and zapping time.
- Encoder alarm events
- IPTV server operation, network traffic and stream processing (via SNMP)
- VCAS Server network traffic and stream processing (via SNMP)
- Middleware and VoD service operation, resources and response time, server/OS/Database health.
- TCP and UDP downloads and uploads against dedicated target servers
- HTTP/FTP transfers from/to public Internet servers
- Simulated web transactions for testing interactive web services.
- ICMP and DNS availabilities and response times
- DHCP and Boot Image server availability and events