

vantiva 
Pushing the edge

NaviGate™
NG
IQ

SOLUTION DESCRIPTION



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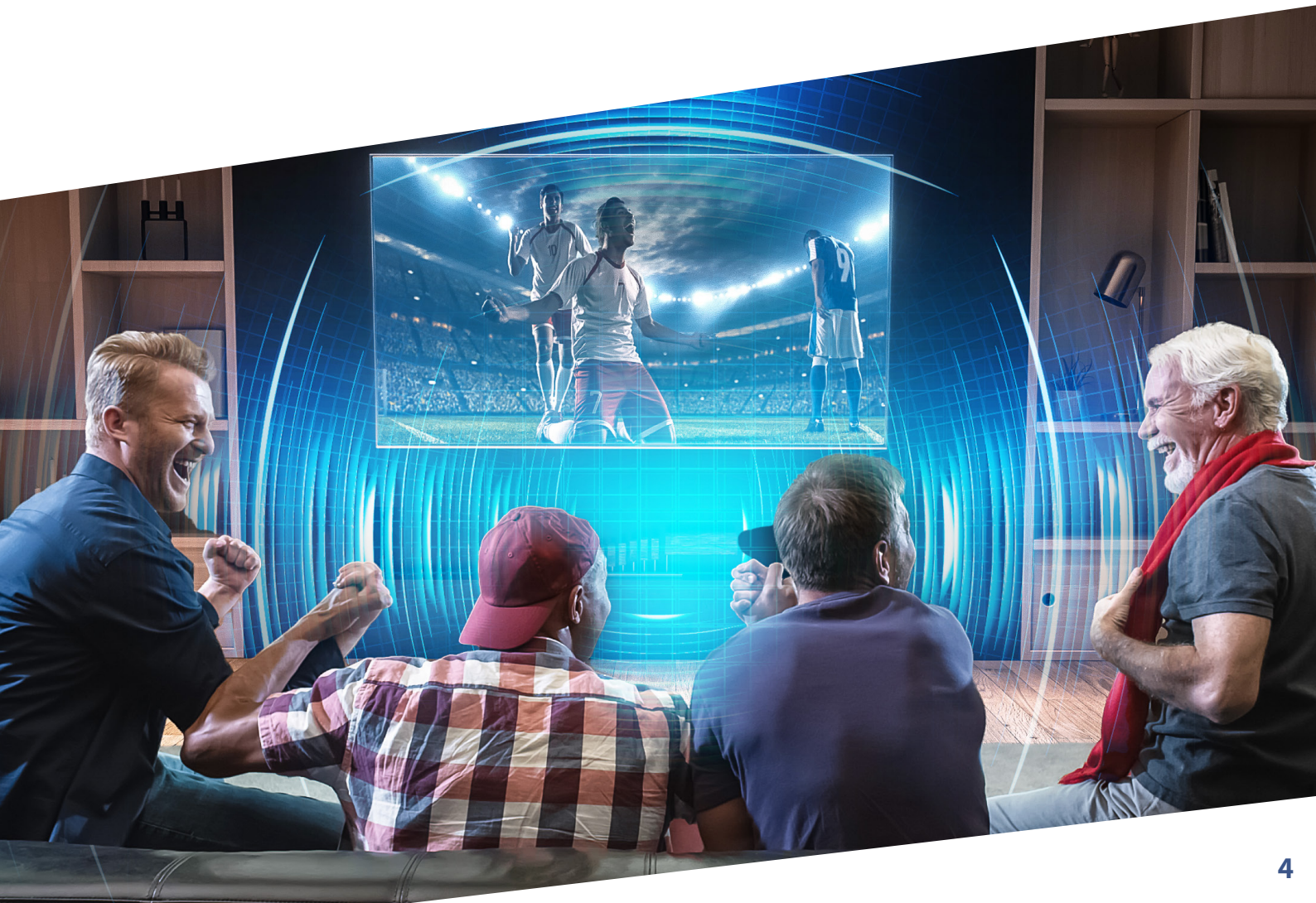
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Introduction

The landscape of television consumption has dramatically evolved **over the last few years**. The number of video services available on the market has increased significantly, and those services can be offered on any network and on any platform.

For a Pay TV Operator, the primary challenge is to provide their subscribers with the right content mix at the right price. To meet the objective to provide the best possible offer, Pay TV Operators have to **understand, in depth, the context of their Subscribers**, how they consume video content and what is attractive to them. Conversely, Pay TV Operators also need to identify what part of the proposed service is not valued by their subscribers.

Vantiva NaviGate IQ™ solution **helps Operators** to understand the pertinence, competitiveness, and quality of their proposed video services.



Introduction


Here are some of the questions that could be answered by the Vantiva **NaviGate IQ™** solution.

A Product Marketing team could ask...

- What is the actual audience of a newly launched live channel?
- What are my different audience profiles?
- What content is expected by my subscribers?
- What are the most popular applications installed on my set-top-boxes (STBs)?

An Operations team could ask...

- What is the real zapping time on my network?
- What is the percentage of STBs connected over Wi-Fi?
- How many STBs reboots were observed last week?
- What is the result of the latest software upgrade campaign?




All of these questions, and more, can be answered by Vantiva NaviGate IQ™, providing consolidated and detailed information about the behavior of TV and applications, Subscribers, Set Top Boxes, and the network.

Solution Benefits

The solution uses the Android TV software environment to **process and consolidate the relevant information** with only a limited integration effort required to adapt it to the Operator environment.

The Operator can then concentrate on the consolidated analytics information, get all the relevant information, identify the trends, and identify risks as well as potential issues.

The Operator can better understand how the proposed STB and Android TV applications are effectively consumed daily and then adjust the service to **improve the Subscriber experience**.




Vantiva NaviGate IQ™ makes it possible to **transform data into knowledge** for decision making.



Vantiva NaviGate IQ™ Solution

Vantiva proposes an analytics solution for Operators that allows a **deep understanding of the subscribers' usage** of Android TV applications and services on the STB.

Vantiva' solution consists of a lightweight monitoring agent running on the subscriber's STB leveraging Android TV APIs. The analytics monitoring agent reports secured and anonymous data consisting of diagnostics and user interaction events that are aggregated and processed by a back-end visualization platform. The resulting output is presented as an **OTT analytics dashboard** displaying trends and usage patterns over a population of IPTV/OTT subscribers.



The Vantiva analytics visualization platform can optionally be replaced by the preferred analytics visualization platform of the Operator.

The Vantiva analytics solution enables the monitoring of the four functional areas below:

CONTENT USAGE

To understand what content the subscriber consumes, from which content provider and when

SERVICE USAGE

To provide a consolidated view of the subscribers' base behavior with the TV service and the related environment

QUALITY OF EXPERIENCE

To understand what TV experience the subscribers receive

CUSTOMER SUPPORT

To understand the performance of the STB devices deployed on subscribers' premises

Vantiva NaviGate IQ™ Solution

The map below represents the functional areas covered by the Vantiva NaviGate IQ™ solution.

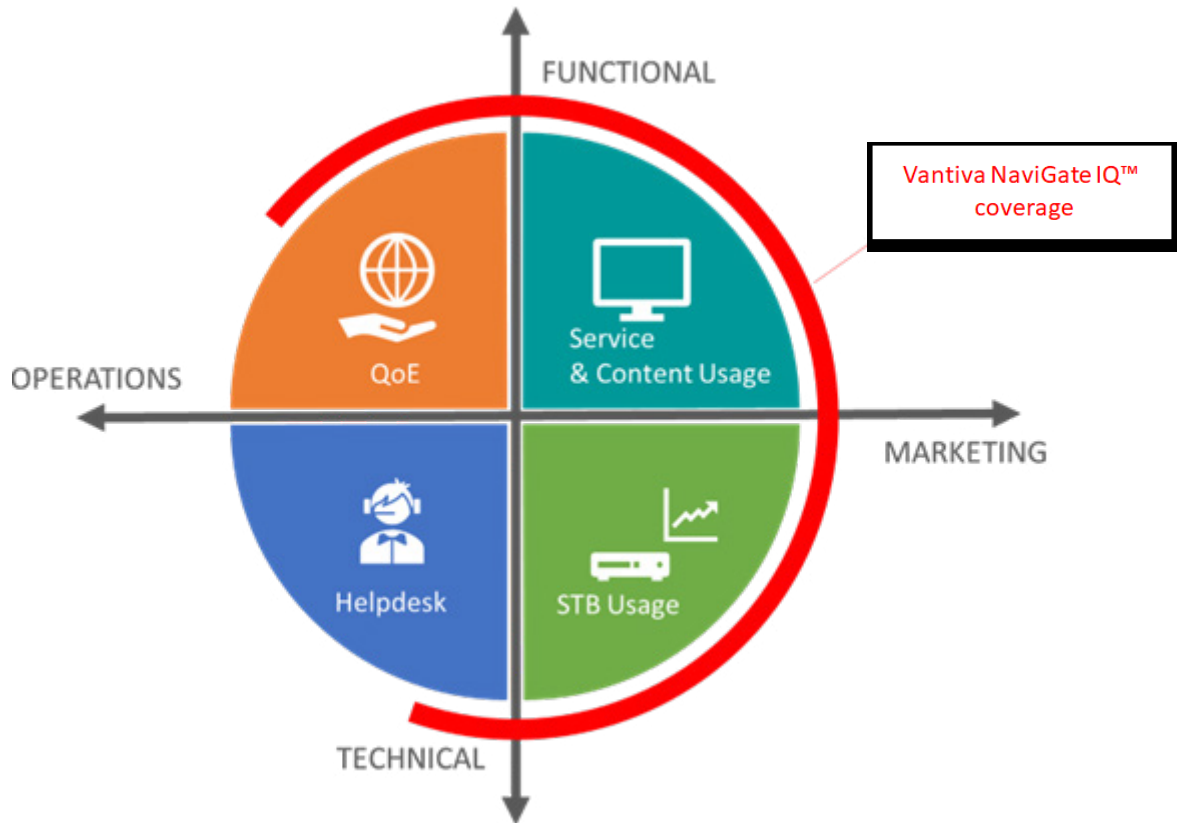


Figure 1. Technical NaviGate IQ™ functional coverage

Users of the Vantiva NaviGate IQ™ solution

The solution is intended to provide information to each team in an Operator's organization:

THE MARKETING TEAM,

who want to understand the relevance of the TV content offers, the services that are of interest to subscribers, trends in content consumption, and closely understand what experience subscribers are seeking

THE TECHNICAL OPERATIONS TEAM,

who monitor the commercial TV network and is looking to detect abnormal situations, understand resources consumed and operational trends, in preparation for the technical evolution of the system

THE QUALITY ASSURANCE TEAM,

who need to get information on the performance metrics of the network

Below is a screen capture, providing relevant information on applications used daily, including statistics on time spent navigating and streaming.

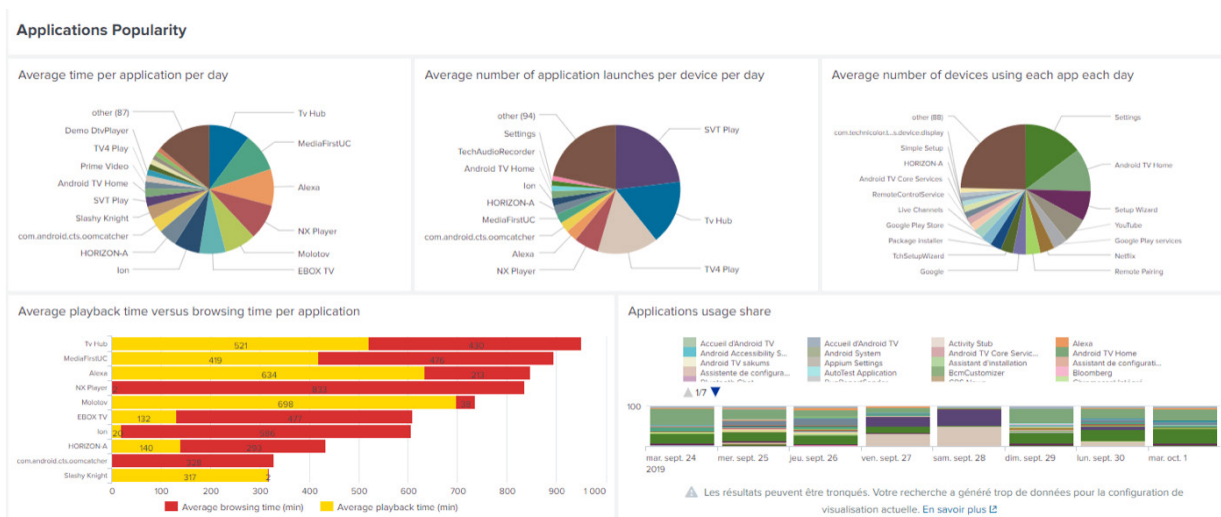


Figure 2. Example of technical operations screen view (service usage per application)

The following sections describe the different areas of analytics provided by the Vantiva solution.

Analytics on Content Usage

The Vantiva analytics platform allows the operator to get access to the following information:

– TV CONTENT USAGE:

- Live channel audience
- Top channels/programs/categories
- Actual watching vs searching for content (or other activities)

– ON DEMAND VIDEO USAGE:

- Number of video streaming sessions
- Video sessions duration
- Actual watching vs searching for content

– ANDROID TV APPLICATIONS USAGE:

- Usage duration
- Number of launches
- Daily profiling
- Top 10 Applications
- Applications category

– INSTALLED/REMOVED/UPDATED APPLICATIONS

– PREMIUM CONTENT:

- Top 10 Premium programs
- Fully watched vs partially watched

The analytics data can be aggregated per day, week, month or year.

As an example, the screen capture below provides the audience for live channels over a given period of time.

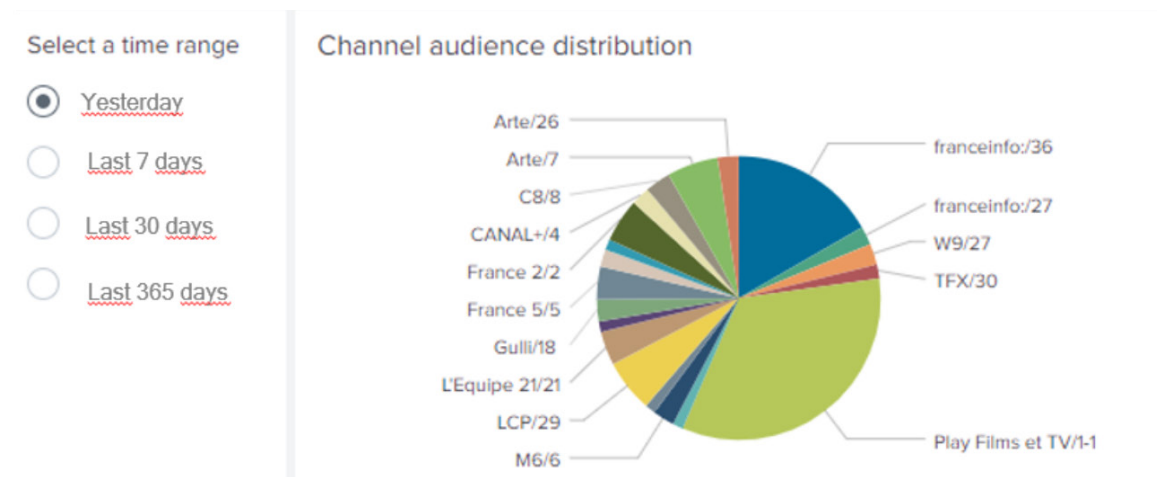


Figure 3. Live audience measurement synthetic screen

Analytics on Service Usage

The Vantiva analytics platform allows access to the following information:

- NUMBER OF ACTIVE/INACTIVE DEVICES
- ALIVE VS DREAMING VS INACTIVE DURATION
STB STATE
- VOICE FEATURE USAGE
- PORTAL NAVIGATION CONTEXT:
 - Recommendation vs deep link vs Home menu
- WEEKDAY / WEEKEND USAGE
- USER PREFERENCES
(e.g. language)
- CONNECTED TV DISPLAY
(e.g. brand, resolution)
- TEXT OR VOICE SEARCH QUERIES
- APPS PLAY AUTO INSTALL SELECTION
- CUSTOMER USAGE OF REMOTE-CONTROL UNIT
- DETECT SHARING OF ACCOUNTS

As an example, the figure below describes the type and brand of the TV sets connected to the STBs.

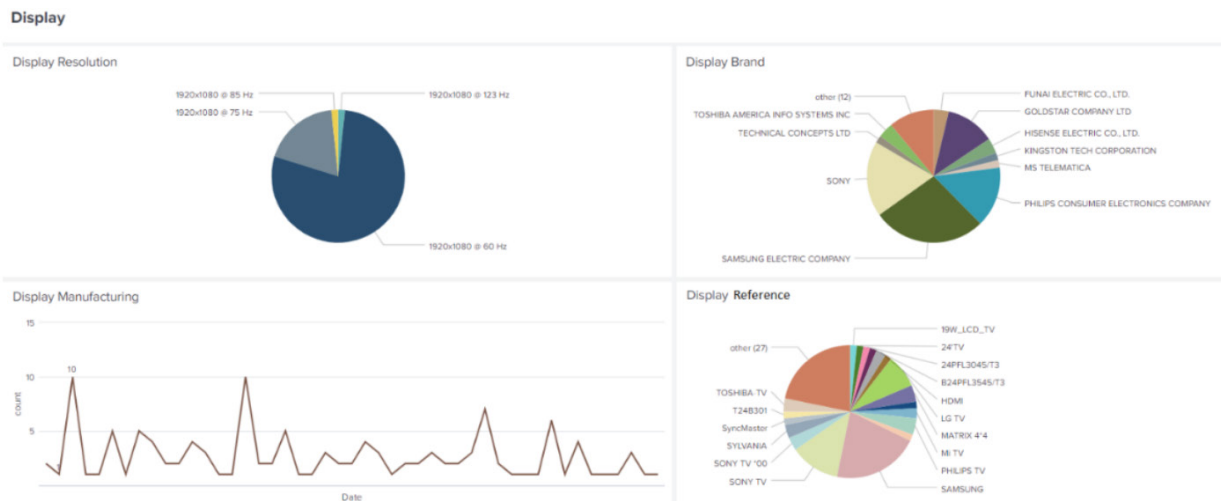


Figure 4. TVs connected to the STBs

Analytics on Quality of Experience

The Vantiva analytics platform allows the operator to get access to the following information:

- ROUGH LOCATION
- WI-FI VS ETHERNET USAGE
- WI-FI PROTOCOL/FREQUENCY/SIGNAL STRENGTH
- STREAMING APPLICATION UPLOAD AND DOWNLOAD THROUGHPUT
- ZAPPING TIME
- BOOT DURATION
- FIRST TIME INSTALLATION DURATION
- STABILITY (NUMBER OF REBOOTS)
- RCU BATTERY DRAIN
- INTERNET NETWORK LOSS
- MEDIA PLAYBACK ERRORS

As an example, the screen capture below describes the connectivity status of a STB, including the number of disconnections that occurred.

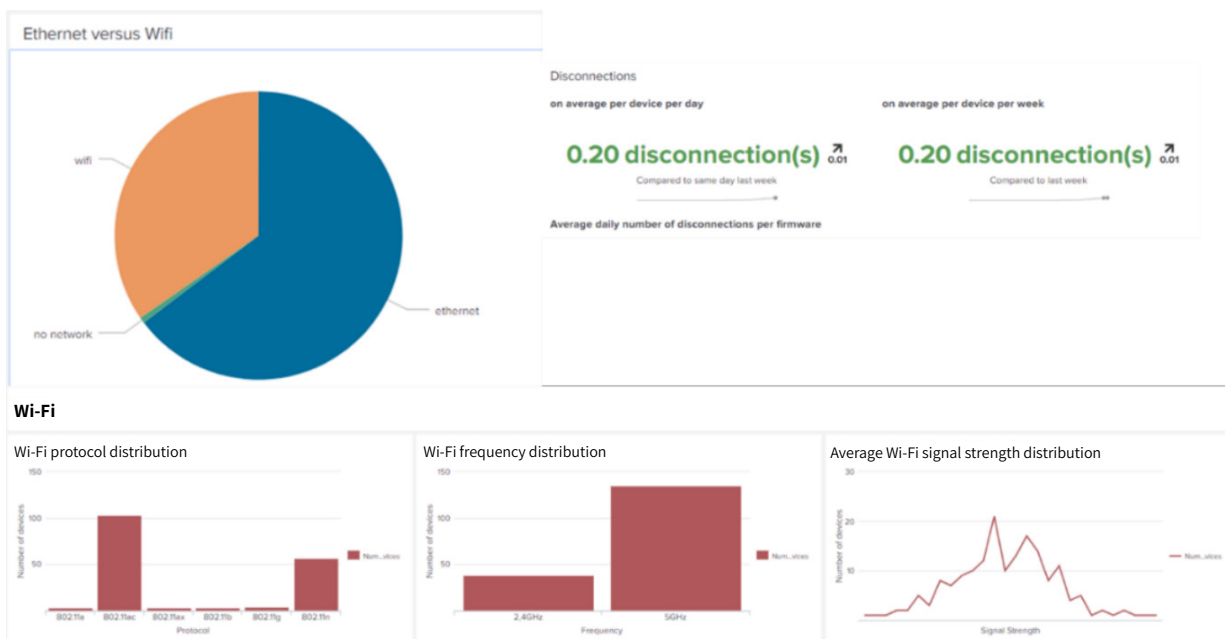


Figure 5. STB connectivity status

Analytics on Customer Support

The Vantiva analytics platform allows the operator to get access to the following information:

– STB VERSION

- Hardware release
- Android TV
- Fingerprint

– SECURITY PARAMETERS

(including identification of rooted devices)

– CPU MONITORING

- Usage
- Temperature

– RAM MONITORING

– WI-FI MONITORING AND RECOMMENDATION

– ANDROID SYSTEM EXCEPTIONS

– INTERNAL AND EXTERNAL STORAGE MONITORING

– CONNECTED USB DEVICES INFORMATION

– CONNECTED BLUETOOTH DEVICES INFORMATION

- Device version
- Battery level
- Disconnection events

– DRM/CAS RELATED INFORMATION

– GOOGLE LOGGED-IN USERS

– BOOT REASON

– HDMI INFORMATION

- Connection/disconnections
- Status of the TV set (on/off)
- CEC

As an example, the screen capture below demonstrates a view of a specific device.



Figure 6. Firmware and DRM related information TV analytics

Analytics on Customer Support

Another example in the figure below provides the CAS and DRM related statistics, and the list of rooted STBs that may require a specific attention.

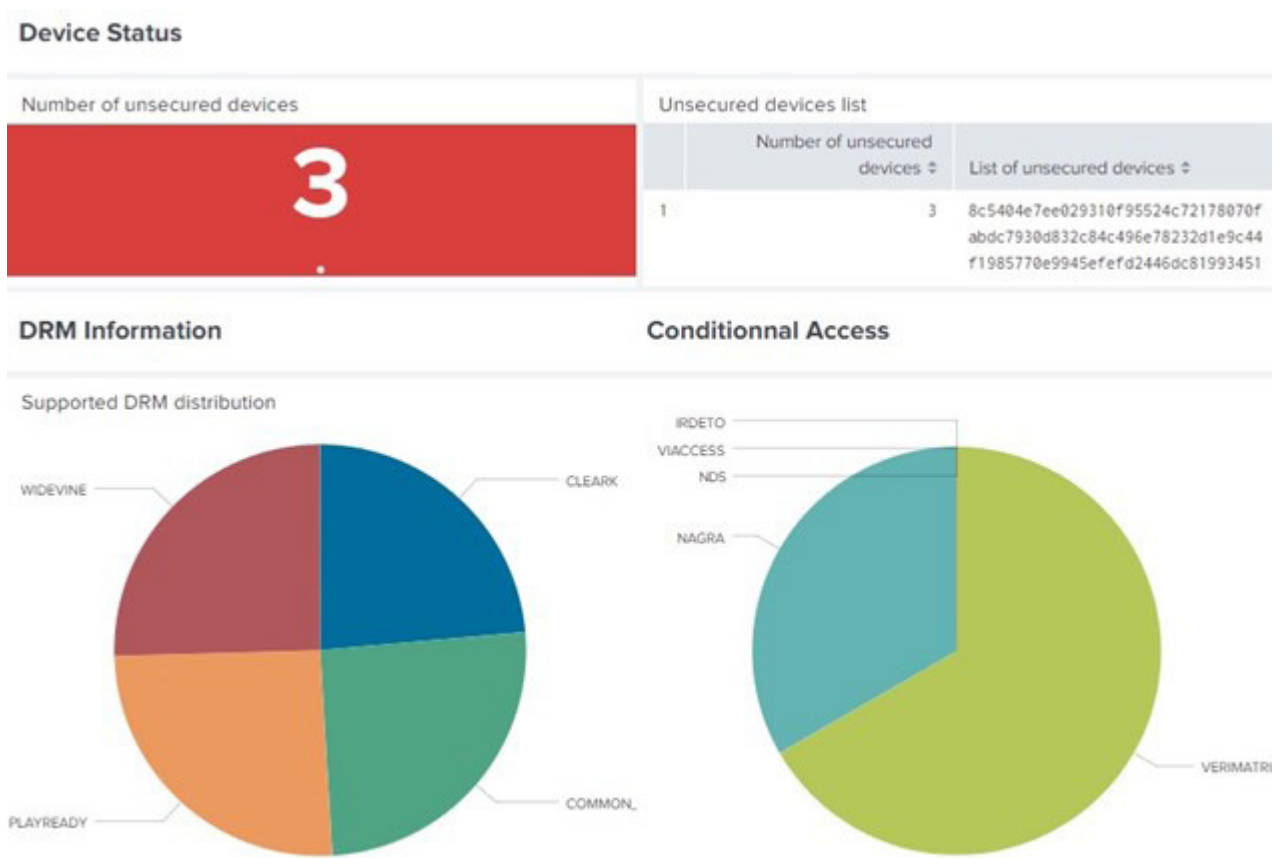


Figure 7. CAS and security

Wi-Fi agent, assistant, advisor and dashboard

Wi-Fi agent is running embedded in the device.

Wi-Fi Assistant is an agent guiding the end-user / technician installer to optimize the Wi-Fi network for the best video quality of experience.

Wi-Fi Advisor is an agent monitoring the STB Wi-Fi connection over a long period of time. It relies on local analytics to detect any QoS variation and provides the Operator with a troubleshooting solution by pointing out to the root cause.

Wi-Fi dashboard aggregates the Wi-Fi Advisor recommendations for all the operator's subscribers base for a global improvement. It is a proactive solution: actions can be taken before the quality is impacted. Operator can improve their QoS in the background (recommending a Wi-Fi repeater for example) and can easily follow improvement actions with KPIs.

As example the figure below provides operators with a simple view of Wi-Fi QoS/QoE of all subscribers' base devices over time, as well as proactive actions.

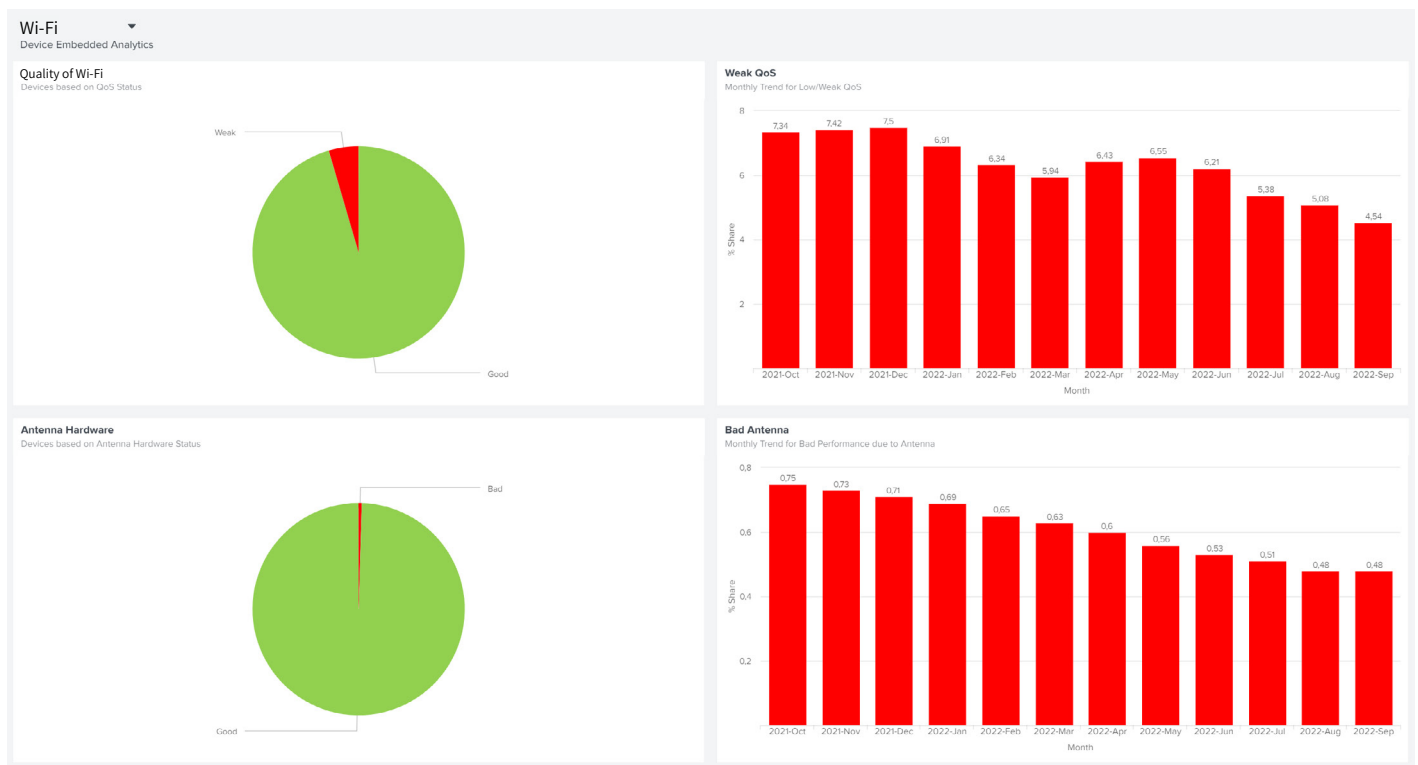


Figure 8. Wi-Fi quality of service for all subscribers

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Wi-Fi agent, assistant, advisor and dashboard

As example the figure below provides operators with a simple view of Wi-Fi QoS/QoE of all subscribers' base devices over time, as well as proactive actions.



Figure 8. Wi-Fi quality of service for all subscribers

Vantiva NaviGate IQ™ Technical Overview

Vantiva's solution consists of a lightweight monitoring agent residing on the subscriber's STB leveraging Android TV APIs. The monitoring agent reports secured and anonymous data consisting of diagnostic and user interaction events that are aggregated and processed by a back-end cloud service.

The figure below provides an overview of the monitoring agent location and integration within the Vantiva Android TV STB.

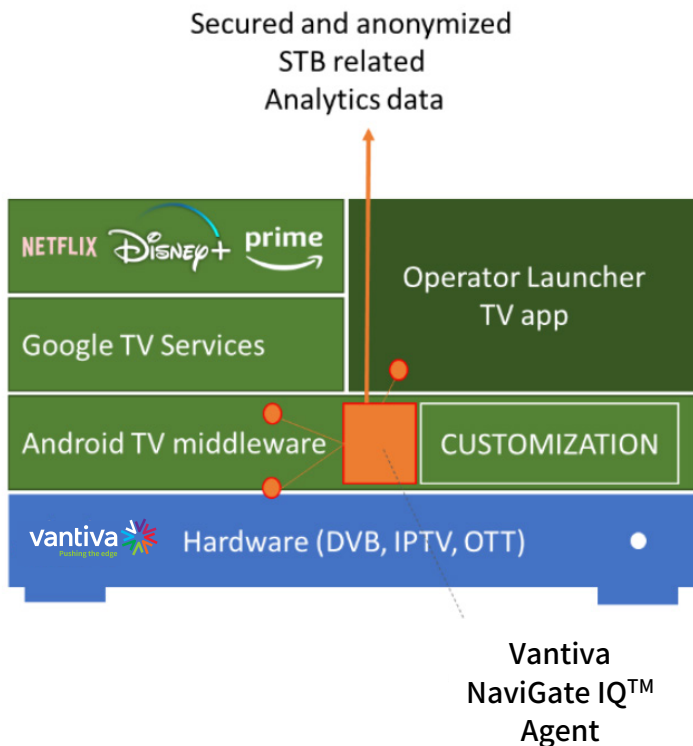


Figure 9. Analytics agent location within the Android TV software stack

The analytics data is collected and processed so that it is consolidated before being visualized. The Vantiva NaviGate IQ™ solution makes it possible to **analyze all the applications** running on the Set Top Box, pre-installed as well as installed by the end-user.

Vantiva NaviGate IQ™ Technical Overview

The figure below provides an overview of the solution workflow .

It is important to note that the Visualization component can be adapted to the Operator’s requirements, if the proposed back end application (Splunk) is not considered.

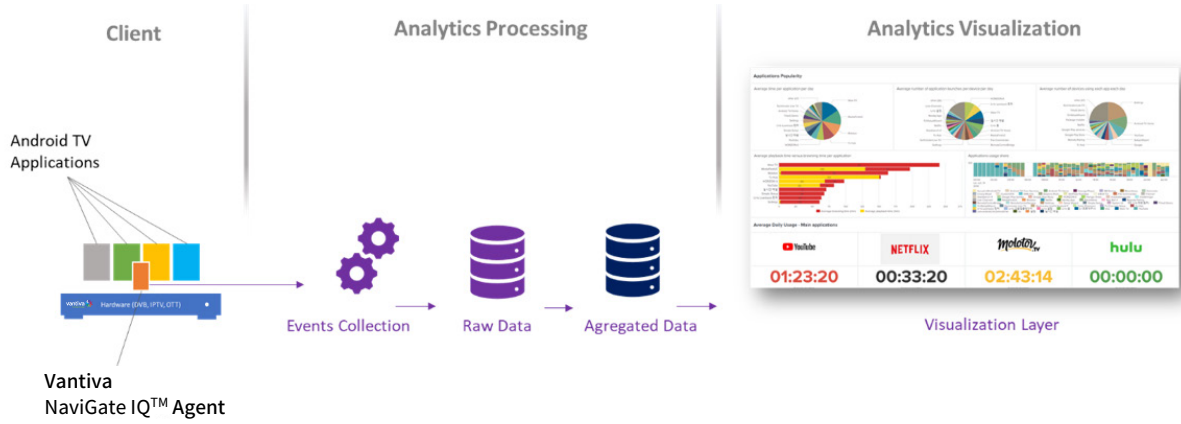


Figure 10. Analytics workflow overview

The collected data is exported to the Analytics backend, making it possible to visualize the aggregated data in a graphical form.

The solution offers the possibility to set notifications upon analytics deviations observed by the system.

The figure below provides an overview of the interactions between the Analytics client, the back end and the Operator’s console.

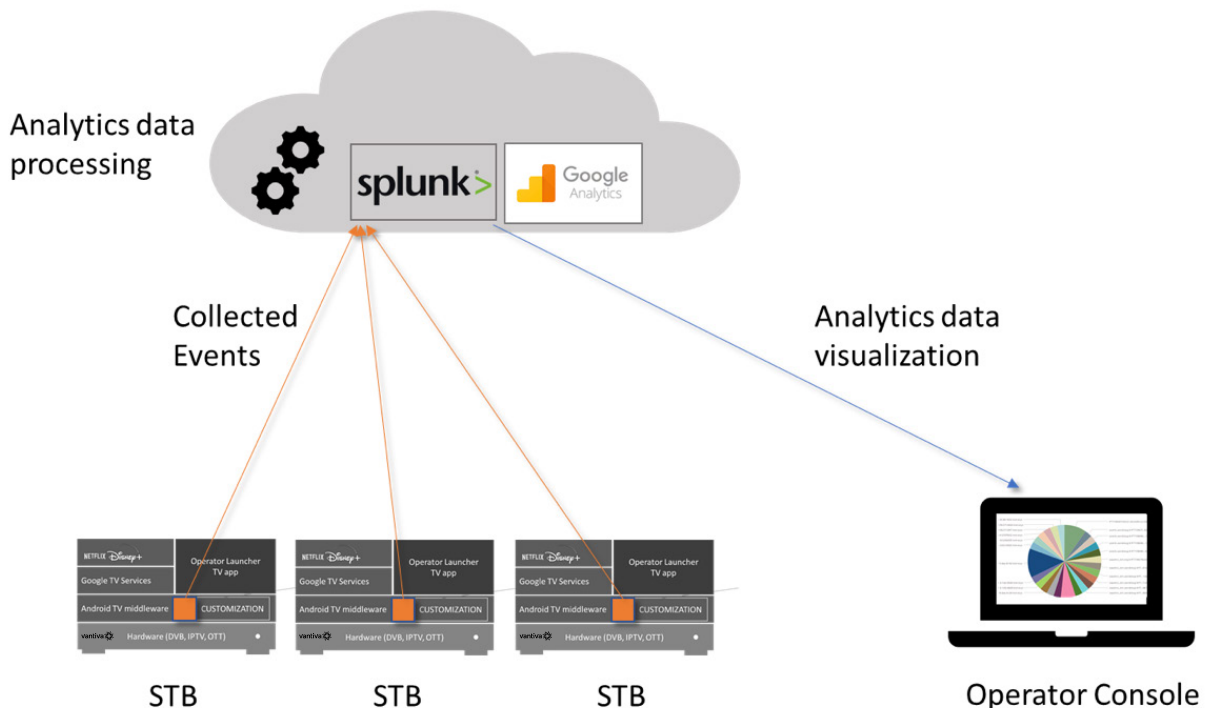


Figure 11. Analytics reporting to Splunk back-end

Conclusion

Vantiva NaviGate IQ™ can assist the Operator with an in-depth understanding of the behavior of the TV solution as well as the way Subscribers are consuming TV from their STB.


It can help in understanding what is valuable to the Subscribers in terms of content, which content is less relevant and what actions are the most frequent. It clearly shows how often each application is used, and how it is accessed.

It also allows the operator to understand the physical environment of the Android TV STB, including the home networking environment and which devices are connected to the STB.

The Wi-Fi features are a powerful solution to **monitor, improve and ensure the best subscriber Video QoE.**

By monitoring security parameters, Vantiva NaviGate IQ™ can help fight piracy in an automated way by identifying devices that have an unexpected configuration and usage.

Accessing these services is made easy thanks to the integration of the Vantiva analytics agent running on the STB, integrated with the Cloud Backend, and displayed on the dashboard.



Vantiva NaviGate IQ™ makes it possible to transform data into knowledge for more informed decision making.



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