










> castLabs

ASSESSING THE IMPORTANCE OF OFFLINE METRICS

BUSINESS INTELLIGENCE REPORT

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INTRODUCTION

More and more, online video services have been adding functionalities to support offline plays. Allowing users access to videos even when there is no connection available helps keeping them engaged and makes for a greater satisfaction and perceived value of the product. There are many reasons to support this decision.

- It ensures a smooth watch of the content. As everything is previously downloaded, there is no risk of buffering, even if the user is playing the highest rendition.
- Offline playback walks alongside with the consumer even to the most remote places. Not all countries, let alone locations, have high speed internet, but that should not stop consumers from enjoying their video services when travelling.
- It is a way to get rid of limitations imposed by strict data plans. Users now have the opportunity to plan in advance what to watch and download it while having a wi-fi connection available.
- Last but not least, it helps users to get around political content restrictions and enjoy the content they are familiarized with everywhere they go.

For all these reasons, offline playback is having a warm reception by developers and users. It makes sense for this, as in a globalized and technological world, content is expected to be ubiquitous. One of the greatest limitations for this consumption are devices running out of batteries, but it is fairly an issue that comes hand in hand with technology and something that we will probably never get rid of.

Video providers are moving forward with this trend and that means being prepared for a new way of using their services with different experiences, problems, behaviors, and so on and so forth. This report plays as an introduction on how to give some first steps in this direction.

For the purpose of this analysis we will follow the path carved by castLabs and NPAW. They offer video player and video analytics tools, PRESTOplay and YOUBORA respectively, both with offline features already embedded. We will dive into their process to understand how do offline playbacks work, misconceptions, new key points and metrics and everything needed to start learning about this new way of video consumption.



NPAW'S APPROACH

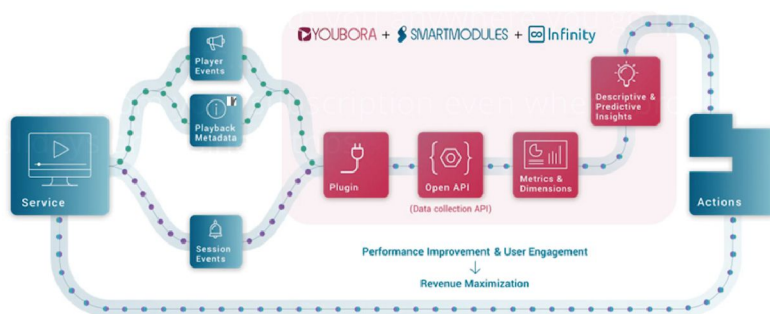
NPAW takes care of everything a video service needs to get real-time full comprehension of how their platform is performing.

Using the YOUTBORA solution, customers install a plugin in their service which plays an invisible part and catches player events and playback metadata using SmartModules and, with the addition of Infinity, even session events.

The open API sets a series of events that are captured in the NPAW's backend. That way, data can be carefully collected and stored to be used for metrics and dimensions calculations. All of this information will be displayed in a fully customizable dashboard that emphasizes the user's needs and key points.

This simple and barely noticeable process allows YOUTBORA to get descriptive and predictive solutions for innumerable situations. Thus, it becomes essential for video service providers to think critically about actions that need to be implemented in the service and reevaluated.

The information is collected using ACTP gate requests, meaning that information is transferred through the internet to reach the backend.



OFFLINE PLAYBACKS

When there is no connection available to send these requests, events need to be stored in the device playing the video. This can be managed using the plugin itself or other SDKs.

Once back online, all the information will be sent in one and only ACTP request. Thus, information cannot be transferred in real-time, as connection is needed to reach the backend, but as soon as the device gets connection back, all the data will be transferred more efficiently, as there everything will be packed up in one simple request.



OFFLINE PLAYBACKS: PRESTOPLAY

castLab specializes in offering many solutions for digital video delivery, being one of these PRESTOplay, a secure and commercial video player available in many devices. Among many features, PRESTOplay counts with a downloader which enables not only the download of the videos offered but also watching these, as content needs licenses to decrypt and play in local storage. This feature is currently working on Android, iOS, and Desktop using a framework called Electron. The process can be simplified in four easy steps that are invisible to the player and depend only on how you do your UX design.



DOWNLOAD CONFIGURATION

The feature will ask you what to download. Here is where your UX design takes place, as you can offer different options to the player (choose rendition, etc.), enable a default configuration.



GET THE CONTENT

All manifest and data will be kept intact from the cloud-storage. This leaves the tool out of any playback problems that appear, as these should be expected also in an online scenario.



ADD SIDE-LOADED CONTENT

Now it is time to get any other secondary elements the player asked for: subtitles, thumbnails and any other. All of these are supported though not being part of the manifest, but they need to be specified and will be put next to the content.



FINISHING TOUCH

Once all is downloaded a little piece of metadata is put with the bundle so only download and available offline tracks appear.



DRM SUPPORT

PRESTOplay supports multi-DRM as far as Widevine and Microsoft Playready are concerned, but remember that these play also a limiting role for different devices.

GENERAL CONSIDERATIONS

Both companies and products have lived together for a while and experienced first-hand some issues that today prove as insightful revelations for the matter of this report. Now that we have a better understanding of how they work together, it calls for a presentation of some notes that can be useful for any video service.

VIDEO STORAGE

The way videos are expressed matters. DASH-Byte Range requests, which conceive the video as one big chunk, allow the tools to work in the background. Segmented content, on the other side, expresses video as thousands of little files, up to 30.000 or 50.000 files. Not only it is slower to download thousands of files. Modern operative systems try to prevent this kind of enormous background work and though restrictions can be avoided in Android if actively informing the user, they are inevitable in iOS.

CONNECTIVITY CHECKS

As mentioned previously, when getting connection back, NPAW's plugin will be able to push collected data upstream, but the integrator of the app is responsible of deciding when to allow that push. Here too, the developer should have a plan or configuration available for the user to decide when to allow downloads. This relates to strict data plans and letting the user be owner of the experience.

Also, it should be noted that grouping download errors in categories becomes also handy for the user and makes for a better UX. For example, it is helpful to understand whether the error pops for connectivity reasons or any kind of back-end issues which the user is not responsible of.

DRM LICENSE EXPIRATION

In a lot of cases, DRM licenses are not indefinitely, but rental licenses with time constraints (usually hours or days).

Depending on the device you might not get information directly from the DRM system on the device, though recently Android allows it, so it is paramount to figure it out and provide the user full understanding of the content expiration date.



Prepare video data for download.



Work on UX. Plan data flow and error displays.



Take care of data expiration.



OFFLINE ANALYTICS

When working with NPAW's plugin developed by castLabs there is barely nothing to be done. The NPAW integration is offered by SDKs and it already includes the offline support for analytics and metrics.

Data push is by default configured to be done when the app startup or when starting an online playback session, as it is considered that by then, connection will be back to normal conditions.

There is no limit for the data to be stored in the device, but NPAW's backend has a week to get it before expiration.

All metrics are included in the offline collection, but there are some specifications that need to be taken into account:



If the device is not set in the right time zone when collecting the data, some issues, like receiving data from the future, may arise.



There is no limit for the data to be stored in the device, but NPAW's backend has a week to get it before expiration.



No rendition changes are to be expected, as the user will only download one version of the content depending on how the service is developed.



Bandwidth will not be affecting the plays while offline and the videos are expected to run smoothly.



Time to first frame becomes a relevant metric. It consists of the time going from loading the manifest until the user sees the first frame of the video, and longer delays can be related to main issues.



Some metrics and events, such as position changes are as relevant offline as they were online, as they are more related with how the user interacts with the content itself.



OTHER FEATURES



PSEUDO-OFFLINE ENVIRONMENTS:

Unfortunately, the real scenarios in which users play videos are not as simplistically binary as online or offline. Real-life situations are quite complex, and they require of intermediate solutions.

Imagine the user being on a bus, train trip, even a flight or while sailing the seas. There is connection, but it is not stable and trustworthy to push the data upstream. In these cases, the need for a pseudo-offline mode arises: you can either streamplay your videos or watch previously downloaded content, but the NPAW plugin will be playing offline and the data upload will be waiting for a desirable connection to be made.

There is no real connectivity and everything plays quite similar to a full offline mode, but as far as analytics is concerned, some metrics such as analytics or events such as rendition changes will be relevant.



There are many ways in which offline playbacks are yet to be fully developed and analyzed in detail. There are two key points thought that are of special relevance for video services and that currently are being carefully crafted:



DOWNLOAD ANALYTICS

Getting the content in the device calls for a completely new way of using the video service, composed of different events and metrics such as pauses in the download, resumes, how long the content lasts in the device before being deleted... Offline behaviors and processes are yet to be understood in their bigger picture.



ADS IN THE OFFLINE SCENARIO

Right now, if ads are embedded within the content (service ad insertion), it can be enabled in the plugin. This will not be fully dynamic. There may be some miss callbacks, but they can be downloaded and playback offline.

Clients ad insertion is a bit more challenging as some callbacks and events are very vendor specific (skip button, first quarter performance and so on and so forth).



CONCLUSION

Offline video consumption is getting a greater role in the way users expect to use video platforms and providers need to address this proactively to adapt and survive. This report provides possible solutions while getting a closer look to PRESTOplay as a playback tool and the NPAW plugin to guarantee proper video analytics.

Offline playbacks store content in the user's device: manifests, side content and meta-data. Considerations will need to be taken into account about when to activate the offline mode and how to deal with data upstreams. Providers will have to develop new UX to ensure a smooth consumption and download of the content, and ease the process with proper video configurations. Analytics' integration will be easily updated to the offline mode and invisible to the player. There will be though differences in the focus of the metrics and events to store, as offline playbacks call for different needs.

There are yet many things to be discovered about offline playbacks, but it is a work in progress which covers from pseudo-offline modes to understanding the role of ads for ads based platforms in this new wave of video consumption.

ABOUT NPAW

A global leader in its industry, NPAW has been providing paramount and scalable big data and business intelligence solutions since 2008. Its focus has been helping online media services make decisions fully based on data and customer comprehension to reach their business goals.

YOUBORA, the company's main ship is a groundbreaking and BI platform that analyzes data across the complete media service. It helps providers into acquiring a full perspective and understanding of how their platform is performing for the users and how do these interact with it. Through machine learning, the solutions provided suppose descriptive and predictive insights to avoid user churning, manage users and advertisement in the most efficient way and get over with all kinds of technical or operational issues.

ABOUT CASTLABS

Pioneers in software and cloud services for digital video markets worldwide. castLabs provide solutions to easily enable the secure distribution of premium movie, TV, and audio assets for high-quality video experiences.

A wide range of applications and services designed to help businesses through the complexities of implementing video technology across a large selection of consumer devices and platforms. We have been operating since 2007 and have offices in Berlin and Los Angeles.



