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TRANSFORMING VIDEO CONTENT CONSUMPTION: MOVING TO THE CLOUD

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Abstract

The emergence of online content and video channels has fundamentally changed our video viewing experience. Watching stored video content has become a norm rather than an exception. For example, the advent of the Digital Video Recorder (DVR) was a key development in harboring this change. A natural complement to DVRs is the cloud as it gives enormous flexibility in terms of video storage and also helps bring down costs. In this paper we put forth a case on the benefits of delivering video from the cloud, with the example of a DVR.

Video Content in a Transitional Phase

Waiting for a sitcom to air has now become a thing of the past. Consumers today prefer online streaming of content on their personal devices at any given point of time. DVRs, for instance, have become a mainstream recording device. Greater brand loyalty of DVR viewers and the steadily increasing penetration of DVRs can present interesting new ways of monetization for key industry players.

Traditionally, broadcasters hosted video content in-house. This put greater pressure on their operations due to additional capital expenditure and maintenance costs. A viable alternative for broadcasters would be to move to a cloud-based delivery network that can provide video content to mobile and Web platforms, both within and outside home. Analysts predict that although cloud DVR has wider adoption with cable Multi System Operators (MSOs), currently, it will be a regular service with every major Multichannel Programming Video Distributor (MPVD) in the US and Europe.

Cloud has a profound effect on the way video content is distributed and shared across multiple device platforms, beyond traditional TV consumption. The merging of cable and the Internet has produced endless new opportunities to present video content on new screens. Improved communication networks, through enhanced bandwidth and throughput to deliver triple-play and quadplay services, can now support highly customized access to videos. Many industry players are moving to disruptive positions along the video service delivery value chain.

For instance, Comcast, one of the biggest television and Internet service providers in the US, recently announced a new feature in its cloud DVR service. It now allows customers to stream or download their video recordings over any Internet connection from wherever they are[1]. HBO and Time Warner are coming up with direct-to-customer applications rather than just creating content. Video-on-demand services like Amazon Instant Video, iTunes gives direct competition to traditional broadcast networks. Netflix has come up with its Open Connect program to ensure last mile video coverage. Leading technology firms are coming out with more upstream services to increase their presence in the value chain.

Cloud is a direct enabler for such industry transformations, making it easier to integrate new devices and delivery channels with existing networks while also reducing Capex requirements. Cloud-based services are more scalable and also help launch new offerings faster, across all platforms.

1. *http://corporate.comcast.com/news-information/news-feed/cdvr-press-kit*

Video Consumption – Scripting a New Story

Rising DVR penetration is only one of the many changes in the area of video consumption. Consumers are shifting to a multitude of devices like smartphones, tablets, gaming consoles to access video content. Although cable/satellite still forms the foundation of the TV viewing experience due to its ease of use, mobile and gaming consoles are increasingly being used to watch videos.

Consumers today have several options in the way they want to consume video content, anywhere and anytime. Their choices have seen a radical shift due to an explosive growth in new video content and the availability of a multitude of devices that support video. The shift is also due to technological transformations such as Big Data video analytics and cloud personalization, which have made it easy to link video content to various devices.

There is still a possibility of improvement in their viewing experience. For instance, take Linda's case[2]. She is an avid TV viewer. However, she finds it tedious to keep track of all the program schedules. She also finds it difficult to pre-load all the video files onto her computer before she starts her daily commute. Premium channels can be really expensive for a TV buff like her, but they are so much fun to watch that she just couldn't give them up altogether.

Consumers like Linda are driving some major shifts in the video content marketplace. Some key trends shaping up are:

- **Demand for more personal and interactive content:** Consumers typically want to control where and when they watch their TV content, and more importantly what they want to watch. Customization of video subscription packages, place and device gives consumers a sense of control and empowerment as it involves how they spend their money
- **Greater popularity of Web videos, especially among GenY consumers:** Free access to video content online has resulted in about tens of billions of views with a jump in year-on-year growth
- **Willingness to watch advertisements in order to access premium content:** In order to watch premium content, consumers are willing to view ads instead of paying up a fee
- **Widespread acceptance of catchup TV and recorded content:** A study by a leading mobile OEM says that about one third of weekly TV viewing worldwide is recorded content
- **Need for seamless access and consistent quality across devices:** Consumers like to move content across devices more easily that would automatically load their favorite content onto the devices

As prime time shifts to "my time" (anywhere-anytime access), traditional content delivery mechanisms will also have to change. Cloud-based video delivery and DVR, in particular, clearly address these challenges posed by next generation TV viewing.

Cloud DVR Service: A Fresh Look

While the cloud has made accessibility to videos easier by standardizing video content to play across a number of platforms, content discovery (the right content for the right audience at the right time on the right device) has emerged as a key issue for consumers. It is necessary to create environments where consumers can easily navigate and discover the content that is relevant to them, bundling service offerings innovatively and intuitively so that user experience becomes more seamless and less fragmented.

In addition to retaining existing DVR functionalities (see Figure 1), the major product drivers for cloud DVR services have the ability to:

- Enable scheduling and recording majority of IP-enabled devices within and outside home

2. All characters, places and events mentioned in this paper are entirely fictitious. Any similarity to actual events or persons, living or dead, is purely coincidental.

» Play and pause recorded content seamlessly across **customer-premises equipment (CPE)** devices such as STB, mobile and Web platforms

» Better scaling through lower cost of storage and network built on a consistent platform and architecture for encoding, scheduling, recording, archiving, delivery and advertising

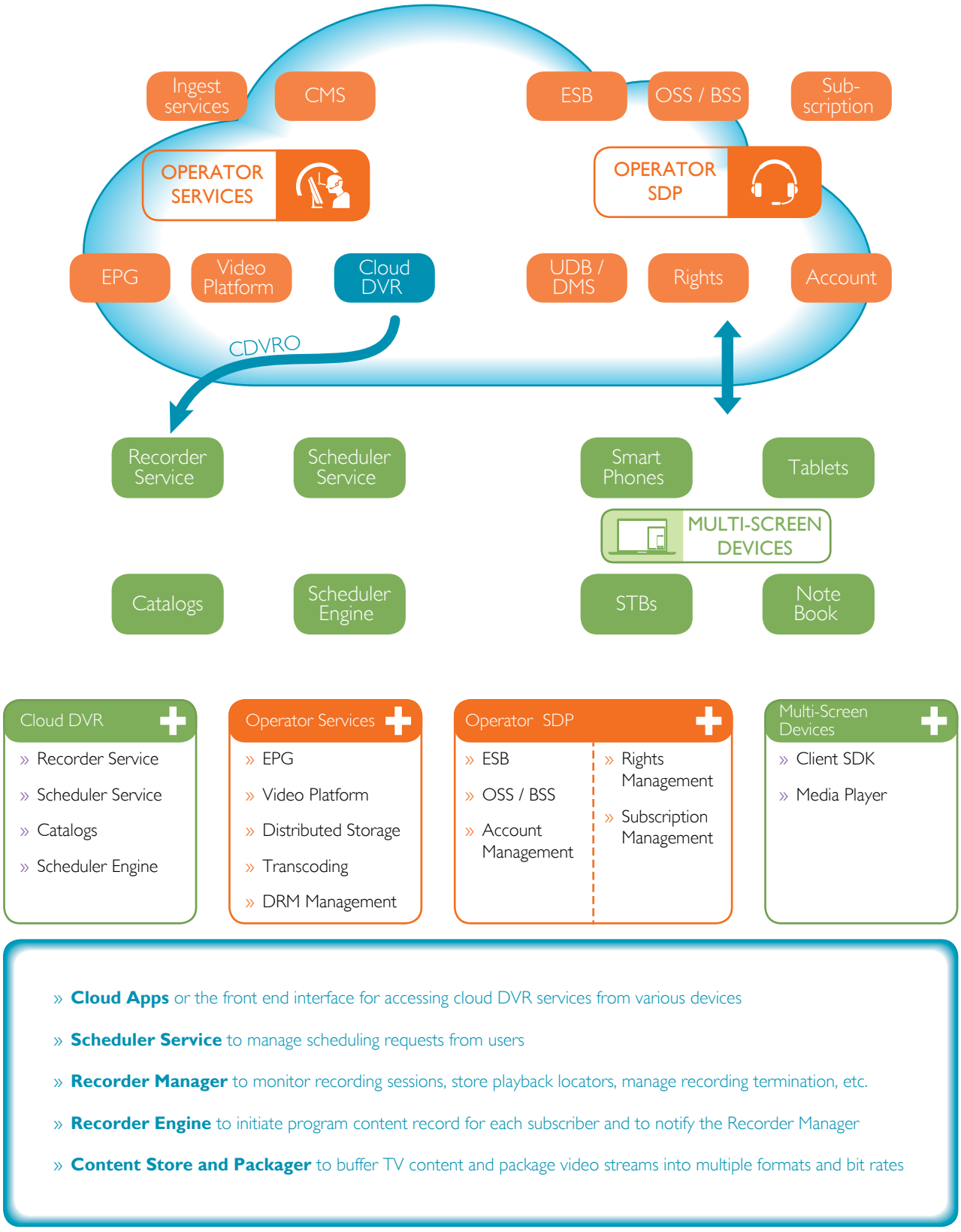

Figure 1: Cloud DVR Framework

Some key highlights of a cloud DVR framework include:

- Solution design using cloud architecture principles for IaaS deployment
- RESTful[3] interfaces implemented as independent Web services
- Horizontally scalable queue centric workflow engines for loose coupling
- Notification technology independent layers for handling high volume data
- Flexible polyglot database adaptations capable of using SQL and NoSQL databases
- Roadmap for future adoption and scaling of performance and load optimization

Cloud DVR offers subscribers the ability to record their favorite TV shows and movies from any provisioned device and watch the recorded content anywhere, anytime, subject to content rights.

Advertisers are also increasingly shifting their strategy and creating more targeted ad campaigns that fit with this new medium of broadcasting content. Additionally, cloud DVR can spawn the creation of innovative services on premium content. It can enable resell and repackage video content such as live show highlights.

Cloud-based DVR solutions can send targeted ads that encourage consumers to watch the recorded content within 3 to 7 days. The decision of whether or not to move to the cloud platform is still dependent on the risk appetite of enterprises. Data security can be a major concern unless clear boundaries are drawn to protect data that cannot be hosted publicly. Private hosting is recommended for sensitive data such as user and subscription information and highly secure services like Digital Rights management (DRM) and Conditional Access System (CAS). Service layers that involve packaging, publishing, content discovery and workflow can be housed on the public cloud.

Conclusion

A myriad of exciting possibilities lie in the future. Is there a scope for something in between the cloud and the user which would speed up data transfer and enhance content security?

While a sluggish video transmission could be a minor worry, a delay of a few seconds in a remote surgical procedure driven through the cloud could lead to death. Perhaps the cloud could be pushed closer to the content consumption layer and user devices. Perhaps the future in video delivery might not entirely be a cloud story.

3. REST (Representational State Transfer) is an architectural style that is used in Web service development.

About the Author

Gowrishankar S Natarajan is a Senior Practice Director with strong delivery experience in cloud-based Content Delivery across products such as cloud DVR, Multiscreen TV, OTT Linear and On-Demand Video services across N-Screen platforms. He has worked with some of the leading global MSOs in the US and Europe, specifically on end-to-end digital video or IPTV systems. This included STB, VOD servers, CDNs, head-end systems and end-to-end systems integration for customer deployments. He also drives the multi-screen video practice for Wipro.

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IND/PMCS/WIPRO/MAY 2015 - JUL 2015