

A photograph of a modern train station platform with a high, arched, white metal roof structure. The platform is clean and mostly empty, with a few people visible in the distance. The sky is clear and blue.

OPEN PLATFORMS THE FUTURE OF CPE IN HOME 2.0

ANDROID™ AND RDK

KEY TAKE AWAYS

Home 2.0 is the creation of innovative products and services by operators to defend their position in the Living Room and to create new source of growth. The role of the CPE is central to many of these services.

User Experience (UX) and Data Insights are the key battlegrounds for video service providers – they have stiff competition from digital disruptors who allocate substantial resources to these areas.

Operators can differentiate themselves in the market with a **High-Quality CPE** based on open source technologies that facilitates putting data at the heart of their business strategy.

CPE hardware and platform software is becoming **commoditized** but this doesn't mean the CPE is **redundant**, as this commoditization is encouraging greater openness in the client software.

Operators should take control of their CPE platforms by selecting a modern open source platform, that can drive **cost reduction in the core CPE technology** and redirect savings into UX and service development. They can also take advantage of accelerating innovation, increasing release cadence, advancing data analytics and the ability to integrate best of breed applications.

Android and **RDK** are both excellent CPE platforms with Android suitable for low-touch deployments and RDK suitable for operators who require more control.

HIGHER STANDARDS OF USER EXPERIENCE

There has been a tremendous leap forward in the standard of user experience required for CPE devices. In the past, the CPE was often the frontend of a monopoly video operator with no significant competitors. Hence it focused on the functional and regulatory issues as well as locking down content. This was often done at the lowest feasible unit cost. While cost is still an important issue, most operators face stiff competition from many new sources including major internet video services. Based on new

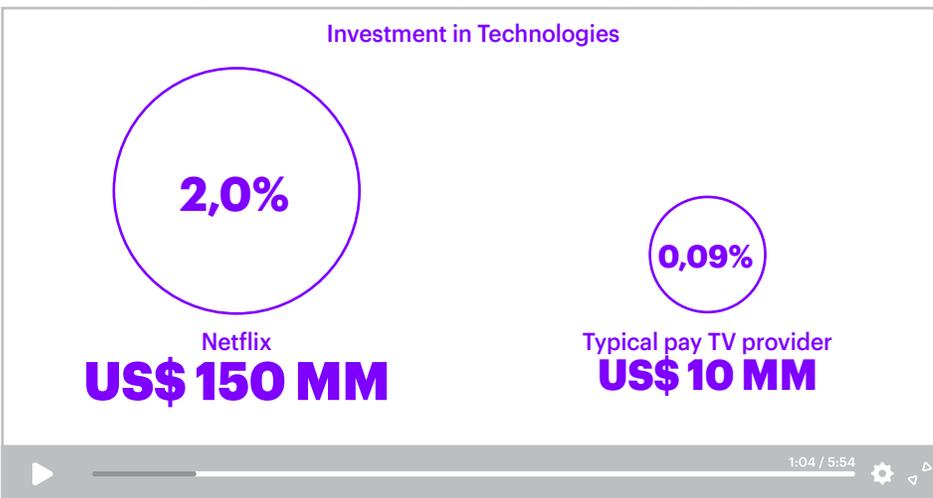
nimbler technology, these new competitors spend a much greater proportion of their revenue on the user experience and personalization. This necessitates a new look at how we approach the CPE as a platform for advanced services.

The new competitors are also aggressively promoting new services into the home and are working hard to get their own CPE devices into the home as a conduit for these services.

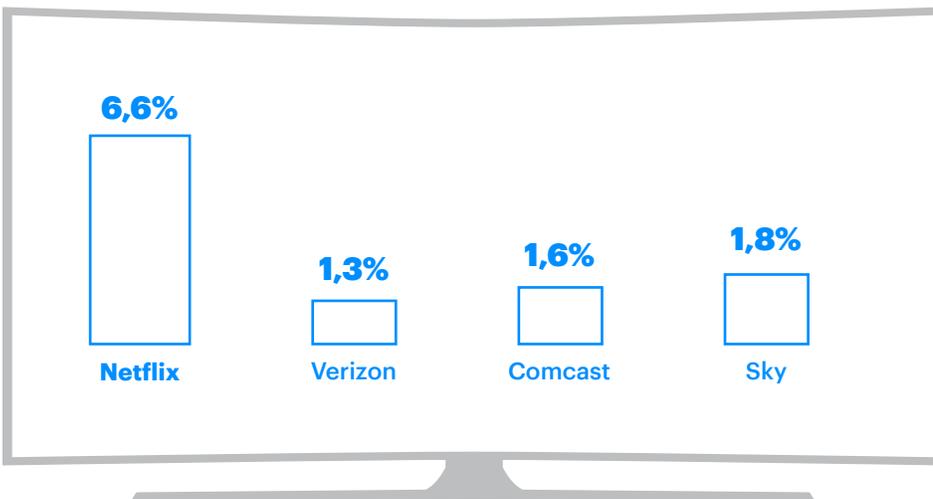
The big question is what will the consumer pay for. This paper briefly examines how we got here and what operators should do about creating a competitive CPE platform for their services. It also dives into how we can use open platforms such as RDK and Android to eliminate effort wasted on low level platform issues and redirect that effort towards user experience and new business model innovation.

After a decade of growing advertising-supported services, will there be a change to subscription or transactional services – now that the value of these services has been understood by the consumer? The trend in data protection and privacy laws globally requires that there be a greater engagement and opt-in from consumers before monetizing data and insights from their home device usage and service consumption. New models of service deployment will need to be adopted if the ad-supported model becomes threatened due to these changes. Ultimately it comes down to whether the consumer accepts the long-term future of ad-supported services – with the compromise to the viewing experience that it involves. Targeted ads may indeed improve the viewing experience and be more acceptable however a commercial break which disrupts the content flow and experience may become a thing of the past. Ad-free viewing is a top positive factor for viewers of SVOD and OTT services where available.

Netflix spends more than 20 times on recommendations than pay TV providers...
 % of monthly ARPU spent on recommendation by NETFLIX vs. a typical pay TV provider



...and has 5 times more resources dedicated to experience and UI
 % of total employees dedicated to UI and customer experience

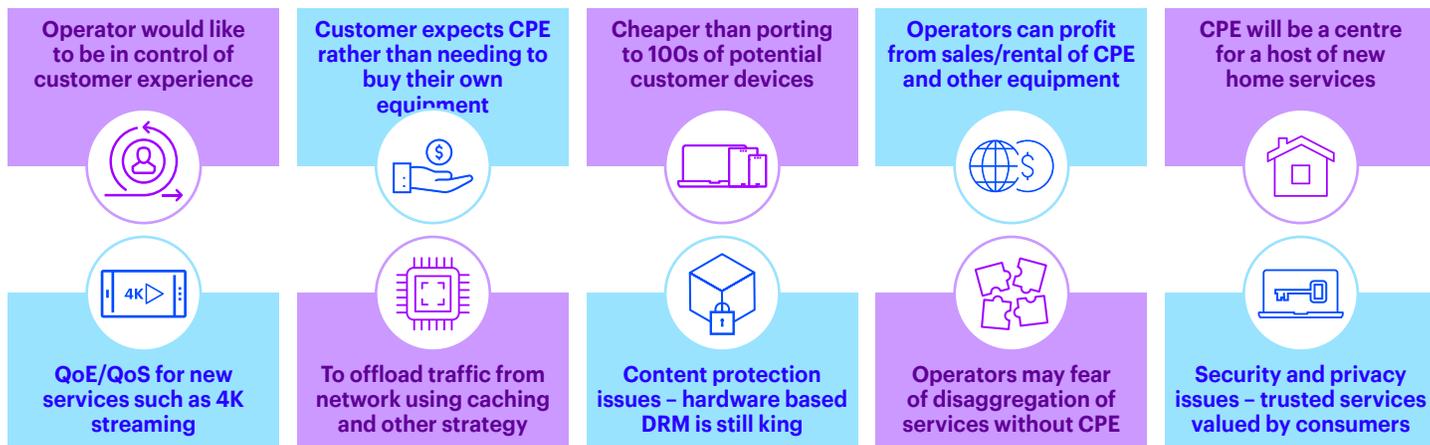


While the market for proprietary STB middleware has shrunk, the Set Top Box (STB) has not. It is more functional than ever, built on high-end commodity hardware and open source software, with the value being realized in new applications and services

Source: Accenture analysis on company data and Digitalsmiths 2016 data and LinkedIn employees profiles titles

WHERE NOW FOR CPE?

ACCENTURE'S VIEW IS THAT CPE WILL REMAIN AN IMPORTANT DEVICE FOR MAJOR OPERATORS FOR A WIDE VARIETY OF REASONS



Control of a branded user experience remains the main reason to adopt and maintain a CPE based approach to video distribution. This includes the placement of applications and the control of where service end-points are available. While operators may wish to capitalize on the availability of additional OTT services they wish to do this in a way which keeps their branding center stage.

Many operators have a customer base which expects to be provided with equipment at a reasonable fee and do not wish to buy their own retail devices to view a service. This is especially true of long standing customers.

It is less expensive to maintain a service on a single CPE than to incur development and other costs for developing Apps for multiple platforms. Typically, these platforms evolve at a rapid pace and leave operators chasing to catch-up with the last release of platform such as iOS, Android and Windows. While these platforms have their place it's preferable to have a flagship STB which has a stable OS and allows the operator to concentrate on features rather than the continuous tracking of externally imposed changes that OS upgrades inevitably create. Operators who sell or rent equipment to customers can create an additional revenue stream.

There is a current trend for large internet companies to create devices to be used in the home as access points to their services, such as Amazon Echo and

Google Home. We see these competitors (who also have video services) working aggressively to build out a physical footprint in the home. This strongly implies that a physical device footprint will be required to compete in the home services market of the future. The battle is about the entry point to the services. The operator who provides the optimum physical solution for activation of services will win this battle. Traditional video operators are ideally placed to compete in this market due to their experience of handling and distributing STB devices, their deep knowledge of customer service and their teams of trained staff who can install equipment and get the best out of the services for the consumer. Internet companies find it hard to replicate the localized nature of these services due to their lack of local service staff outside of major markets.

With bring-your-own-device it is typically very hard to guarantee QoS for high-end video services such as 4K when run purely as OTT. If these services are sold as a premium sports or movie offering, then the STB is the device best placed to deliver a consistent premium user experience. In the very near future we may have 8K and even beyond and there will be a need to support this high-end experience which customers value. Additionally, STBs can be optimized to avoid lip-sync, audio and aspect ratio issues which often affect unmanaged delivery platforms.

In broadband environments where streaming is unreliable then the STB provides the means to offload peak traffic using either pre-cached recording or using broadcast technologies which are still the most efficient means to distribute content at peak times. Hardware-based content protection schemes are still the most trusted means to avoid piracy of premium assets by video operators, sports rights owners and studios.

For many video operators, the protection of the core portfolio of brands associated with their video content is a key reason for delivery via an STB. For unmanaged platforms, there is a real risk of disaggregation of valuable content, demotion of premium content or repositioning of own content assets to assist a competitor rather than drive viewers to the operator's own services. In addition, there are questions of where the revenues from new advertising services will flow in any horizontal video market.

Video operators have high marks from consumers for commitment to privacy and are trusted more than internet companies. This is a key source of competitive advantage in future as consumers become more aware of how much of their data is available and being exploited. STBs can provide a greater sense that data is stored and protected in their home and thus would be a powerful tool to persuade consumers to accept new types of services.

CPE ARCHITECTURE AND PLATFORMS

CPE architecture has come a long way since the early days. Originally conceived as a means of descrambling analog content, the CPE quickly gained a wide variety of features as we moved into the digital world such as Electronic Program Guide (EPG), Video On Demand (VOD) and Personal Video Recorder (PVR). In the past CPE developers spent a significant effort in building 2D user interfaces with animation using proprietary technologies. This can now be replaced by efficient and high-performance implementations of standard UI technologies such as HTML5/JavaScript and Java. Complex features such as local PVR are being replaced by cloud based

storage. The limiting factor for such progress is not the technology but often legal and rights issues. As these are solved we will see further integration of cloud functionality into CPEs.

We expect that STBs will move towards being pure IP platforms with a diminishing importance attached to broadcast technologies. Some broadcast technology will persist to address certain market niches but the mainstream will fully switch to IP delivery within 10 years. These STBs will not be standalone devices anymore but will operate as part of an ecosystem of devices. In many cases the current types

of graphical user interface will no longer be the primary interface but we will move towards Zero User Interface (UI) which encompasses voice, motion and other types of non-visual UI technologies. The use of connected AI systems will allow common tasks to be seamlessly integrated with assistance starting from interactions with customer service. The most effective use cases for AI technology are ones which support human decision making such as reducing choice to a manageable set of options, eliminating tedious tasks and supporting flexible interaction models where the user is not confined to a pre-determined set of commands.

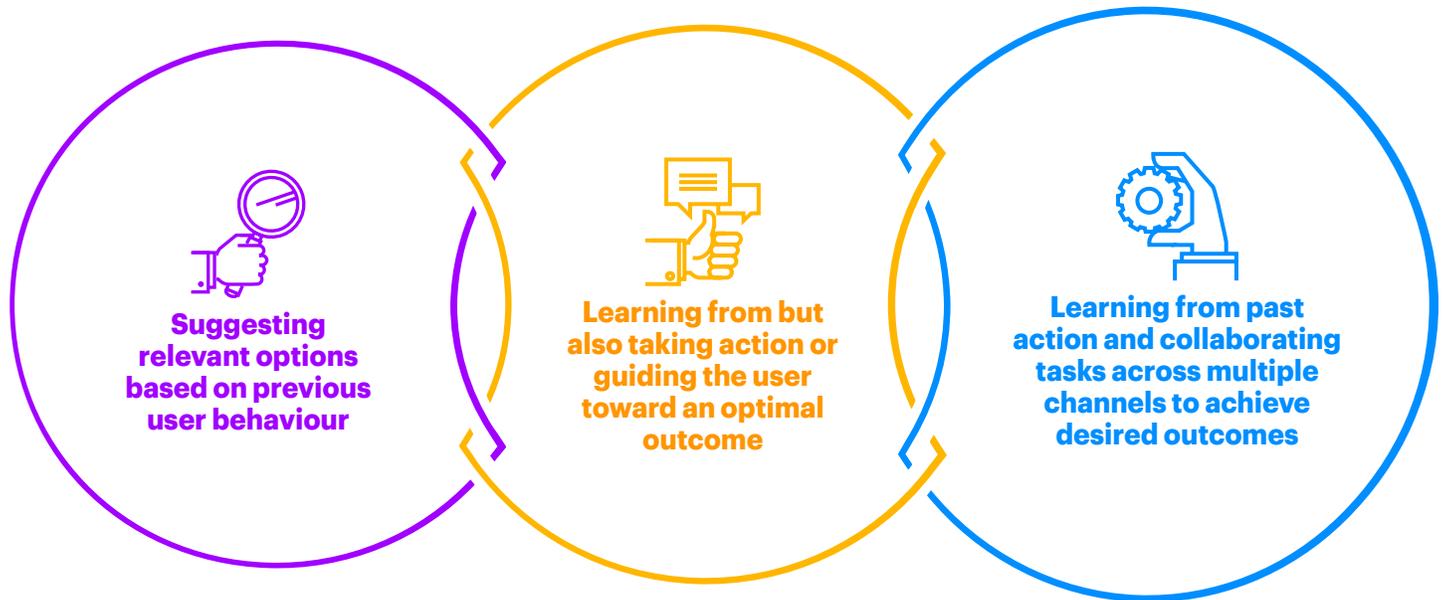
	Pre-history	1995	2000	2005	2011	2017	2022
Flagship Product	• Analog Zapper	• SD Digital Zapper	• SD Digital PVR	• Digital HD-PVR	• Hybrid HD-PVR • Home Gateway	• Connected 4K PVR • Pucks & Sticks	• Home Hub
Key Features	• Analog PPV	• Program Guide • Pay-Per-View	• Simple Recording • Series Linked Recording • Time Shifting	• VOD	• OTT • Catch Up TV • Live IP Streaming • Ad-Insertion • Personalization • Recommendations	• Targeted Ads • TV Apps • Voice Control • Network PVR • Box Sets • Media Casting	• Pure IP Platforms • Connected Platforms • AI Assistance • Zero UI • Cloud UI
Video	• Analog	• SD • MPEG-2		• HD • AVC • MP4	• HSS/HDS/MSS	• 4K • HEVC • MPEG-DASH • Dolby Vision • HDR	• 8K • High Frame Rate
Audio	• Analog	• MPEG-2 • Dolby AC-3		• AAC • Dolby Digital Plus		• Bluetooth Audio • Dolby Atmos	
Connectivity		• SCART • Component Video	• Ethernet	• HDMI 1.x	• WiFi	• HDMI 2.x	• SuperMHL • Gigabit Ethernet
Control		• Infra Red			• RF	• WiFi • BT	
Security CA/DRM	• Line Cut-and-Rotate	• Smartcard CA • Macrovision • DVB-CSA			• DRM • PlayReady	• Cardless CA • Trusted Execution Environment	
Platform	• Typically no Softwares	• Proprietary STB OS	• Proprietary STB OS	• Linux OS	• Open Source Software Components	• Android • RDK	
Hardware	• Signal Descrambler • Addressable	• 2M Flash • 2M RAM	• 8M Flash • 8M RAM	• 64MB Flash • 64MB RAM	• 256MB Flash • 256MB RAM • 3K DMIPS • Multithreaded • Single Core • OpenGL GPU	• 1GB Flash • 2GB RAM • 20K DMIPS • Quad Core • 64-bit	

Implementing voice interfaces requires a very high level of abstraction and the creation of understandable models of interaction for the user. The CPE can act in various roles such as curator, advisor and orchestrator. For many businesses, the personas of AI will come to represent their business as much as any celebrity endorsement does now.

We also see the STB being a trusted integration device for Internet of Things (IoT). This will be Home 2.0 – advanced home services delivered using a combination of advanced STB and cloud services. Many operators are seen as trusted providers for this type of technology and have the service organization to fully support its rollout

beyond early adopters and into the consumer mainstream.

In summary while some features of CPE will move to the cloud, there will be a corresponding rise in connectivity, Quality of Service, AI supported advanced user interface and IoT features.



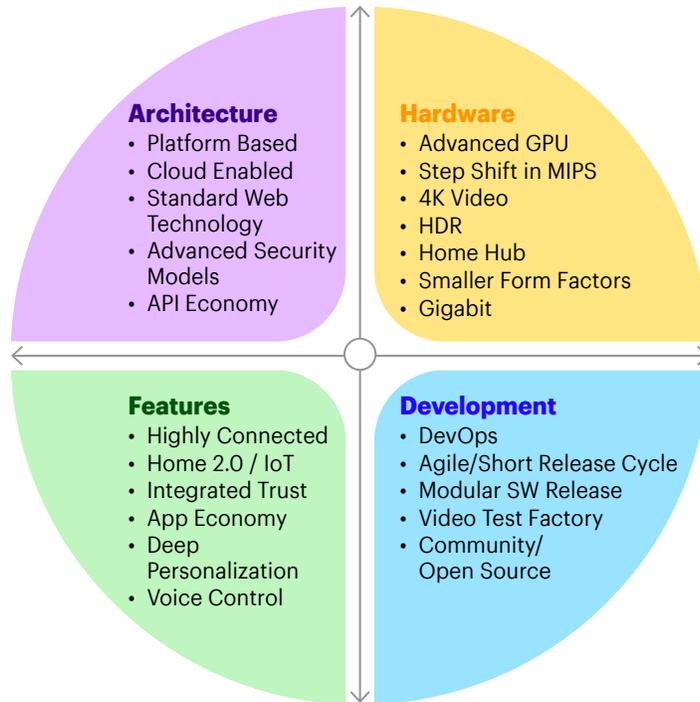
DIRECTION OF CPE PLATFORM ADVANCEMENTS

In the world of CPE development, we see progress across four different axes which greatly increase the usefulness of the CPE devices.

The hardware of the CPE has progressed rapidly in the last few years with typical CPE having an estimated processing power 600% greater than five years ago. New CPE System on Chips (SoCs) have tracked device performance on mobile platforms very closely with some crossover of technology between CPE and mobile. This has positive side effects for power consumption, operating systems and many other areas. The HW is becoming more commoditized with less CPE specific features and much commonality with mobile platforms. Vendors who specialized on broadcast features such as DVB are being overtaken by general purpose vendors with HW devices which provide more cost-efficient solutions.

The architecture of CPE has changed from a typically closed device to a more open stance with standard web technologies such as HTML being used while security and content protection issues still remain a priority. This greatly reduced the cost of the CPE software due to use of common standard software components while at the same time increasing the features of the devices. Advances in Cloud technology have allowed us to shift certain functions to the cloud in a highly scalable way such as management of recordings, personalization and recommendations. The API economy allows a full array of web services to be deployed to CPEs. On the device, the use of standard driver level Linux interfaces such as OpenGL has greatly reduced costs in this area.

Among the many advances in CPE development probably none is as big a change as DevOps. CPE release cycle times have reduced from typically 1-2 releases a year to a full agile driven development cycle with releases possible at a cadence of monthly or even faster by some operators.



Learning from the Internet companies that championed the process, it is now possible to test new feature ideas with a small portion of CPE population either using A/B Testing or User Trial with both closely supported by analytics. Open source has had a dramatic effect on the CPE SW world with a substantial proportion of what was previously proprietary middleware being replaced by open source components such as OpenSSL, Webkit, Gstreamer, DBus, and many others.

CPE have experienced a rapid growth of features as a result of becoming connected devices. Until a few years ago even cable devices did not exploit the possibility of IP connectivity. That has all changed with IP being the core transmission technology of the future.

THE CPE AS A HOME PLATFORM

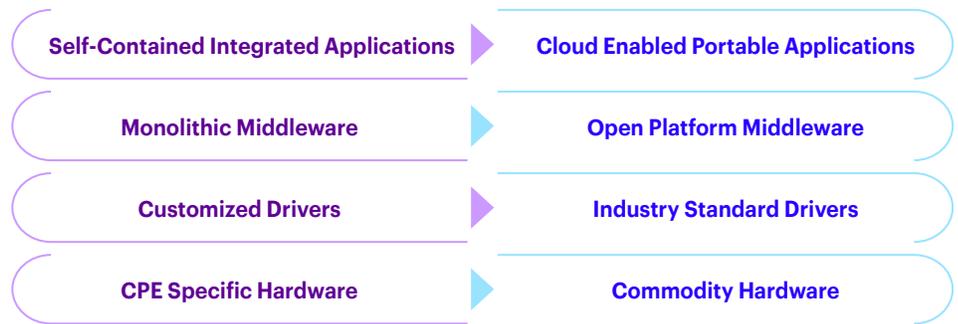
LACK OF PLATFORM ORIENTATION RESTRICTING NEW MODELS OF SERVICE DEPLOYMENT ON CPE

The old model of CPE development was based on very customized, specific and often proprietary software and hardware. This added to the cost of the whole software stack and left little room for investment in new applications. Indeed, the applications were often written as highly integrated native software which was very difficult to change and improve. The hardware was expensive and often had very specific broadcast features which were limited to a few suppliers and thus there tended to be limited competition.

The new model is built on open platform middleware which runs on industry standard drivers and OS such as Linux. It

runs on general purpose commodity hardware which is multi-sourced and competitively priced. This model allows most of the operators' investments to be on the application and services side. Applications written using standardized

methods such as Java and HTML/JavaScript are enabled with Cloud-powered services which enhance the user experience and facilitate the integration of compute and data storage intensive capabilities like Machine Learning and AI.



NEW PLATFORM OPTIONS

There are a number of platform options which are now available to move operators forward towards better cloud based architectures and cost-effective platform software. In this section, we examine the defining traits of two major CPE platforms, RDK and Android.

	RDK	Android
Originator and interests	Comcast • Large US Cable operator	• Vendor of white label E2E video solutions Google • Search Engine • Online Advertising • Video Hosting Services
Announced Users	• Comcast X1 • Liberty Global • NOS • JCOM • TeleColumbus	• 20 operators now launched in 14 different countries... with 40 more launches planned
Controller	• RDK Management, LLC	• Android Open Source Project • Apps controlled by Google
Audience Sweet Spot	• Targeted at the needs of Tier 1 operators especially cable high end CPEs	• Targeted at mobile handsets, SmartTV and OTT
General Approach	• A collection of OSS components with appropriate glue and interfaces which are available to port and integrate with proprietary software • Application framework is for operator to decide	• Reuse of very successful mobile solution for TV environment • Can provide a full solution
Application Technology	• 3 rd Party App suppliers • No restrictions on choice • Preferred HTML5/JavaScript	• Android Java • Android Runtime/AOT compilation • Android Webview Browser Technology
Middleware Technology	• WPE Browser • Gstreamer/RDK Media Framework	• Android Runtime (ART) • Android System Libraries • Android TV Input Framework
Choice of Chipsets	• Broadcom. • Some other SoC support by 3 rd parties	• Broadcom, Marvell, Mstar, Amlogic and others
Support	• RDK has an Advanced Support Platform (ASP) Program • Emphasis on keeping CPE close to current release implying continuous integration of recent RDK versions	• Android provides extensive support online; 3 rd parties provide paid android support • Android release supported with security patches for 4 years • Android releases older than 2 years are not supported in certification process for new devices

A NOTE ON ANDROID FLAVORS

Android can be used in a variety of different ways. The most basic being Android Open Source Project (AOSP) which contains the core open source Android platform through to the AndroidTV platform which adds Google licensed Apps such as YouTube, Google Assistant etc.

There are few restrictions on Android Open Source Project other than the fact that it is ultimately controlled and driven by Google. However, a branch may be taken at any time without many of restrictions discussed in this document. The main issue with this is that you lose access to the Google Play store and many of the more attractive features.



Android AOSP	<ul style="list-style-type: none"> • No commercial agreement with Google • Can branch, remove components or maintain compatibility as required • Can use compatibility tests which are open source to maintain platform stability
Android TV	<ul style="list-style-type: none"> • Commercial licensing with Google • Full compatibility • Google Play, Search and other applications
Android TV Operator Tier	<ul style="list-style-type: none"> • As Android TV with additional agreements to cover revenue on Play Store • Operator billing • Possibility of some more negotiated flexibility

COST OF PLATFORM OWNERSHIP COMPARISON

THE 16-POINT CPE COST MODEL

A wide range of issues need to be considered when choosing a new platform – these costs will vary by the situation and by the amount of customization and additional features to be built. Our model of costs outlines the main areas which cause direct and indirect costs to an operator. Indirect costs can be hidden from the operator but charged to vendors either as fees or additional expenses to pass certifications or test suites.

The selection of a new CPE platform depends on a wide variety of factors which must be assessed in the context of the operator’s technical capabilities and their current market needs. The range of needs covers everything from off-the-shelf full stack solutions to highly customized software stacks with proprietary unique features. Such decisions are often aligned with scale, with larger operators seeking a unique experience and flagship product while smaller operators are cost sensitive and seeking only a branded user experience. These platforms cover these varying requirements when supplemented with external services and software.

- 1 License Costs**
Costs of license involved in using the platform.
- 2 Engineering Costs**
Cost of customizing the solution to your requirements.
- 3 Costs Charged to CPE Vendors**
Customisation costs to your supplier.
- 4 Application Development**
Effect on application development.
- 5 Porting Costs**
Cost of porting solution to a new HW platform. Cost to get any code you don't own changed or fixed.
- 6 Software Source License**
Cost of licensing source required.
- 7 Time-to-market for Solution**
How quickly can a device be launched?
- 8 Warranty**
Who provides warranty on code?
- 9 Quality of Test**
What is quality of testing done and who is responsible?
- 10 Configuration Management**
Are releases managed correctly?
- 11 Security**
Can the solution be updated to fix security issues?
- 12 Documentation**
Poorly documented solutions can be very costly.
- 13 IPR**
Who owns the IPR of platform? Do you own any differentiating feature you add?
- 14 Open Source Software (OSS)**
What sort of OSS licenses are used? What are restrictions and costs imposed?
- 15 CA/DRM Integration Costs**
Does the solution support the CA/DRM constraints? Is CA/DRM solution integrated already?
- 16 Certifications**
Is the solution certified for HDMI/Dolby/CA/DRM etc.



COMPARISON OF RDK AND ANDROID COST OF OWNERSHIP POSITIONS

Lever of Cost	RDK	AOSP/Android TV
License costs	<ul style="list-style-type: none"> No per CPE license costs 	<ul style="list-style-type: none"> No per CPE license costs
Engineering costs	<ul style="list-style-type: none"> High. Due to flexibility and many options available which need to be defined and chosen 	<ul style="list-style-type: none"> Low if Android TV route is chosen. Higher if AOSP is chosen
Costs charged to CPE vendors	<ul style="list-style-type: none"> Self-certification so no certification fee though there are fees for access to the RDK test suites via ASP 	<ul style="list-style-type: none"> At the moment certification is done by Google at no cost. This may change in future as the deployments increase Until recently Google usually only worked with hardware OEMs. Now they plan to work more broadly with the ecosystem such as operators and system integrators
Application development	<ul style="list-style-type: none"> Application model is currently undefined. Defining the model is best done by an application vendor. RDK provides an emulator for application development. Any IDE could be used 	<ul style="list-style-type: none"> Java based development with Android system libraries used for all major middleware functionality. Android Studio is used for application development and emulation of devices. Android Studio is a very high quality IDE
Porting costs	<ul style="list-style-type: none"> Basic port is provided by SoC manufacturer. Additional costs for any CPE specific items 	<ul style="list-style-type: none"> Porting is usually done by hardware vendors. A wide variety of hardware is supported but could be added costs for any new hardware elements. Android certification requires that you do a complete port and not omit any required interface
Software source license	<ul style="list-style-type: none"> Apache 2.0 for approx. 90% of components RDK Licence (free) for some legacy components New components are all Apache. DVR components are RDK license for IPR reasons 	<ul style="list-style-type: none"> Apache 2.0 for AOSP Normally no sources available for Google components such as YouTube, Chrome, Play Store if used
Time-to-market for solution	<ul style="list-style-type: none"> 6-12 months with Vendor Application suite Longer development timescales for custom frameworks 	<ul style="list-style-type: none"> 6-12 months depending of level of customisation Many 3rd party Apps pre-integrated
Warranty	<ul style="list-style-type: none"> No warranty provided 	<ul style="list-style-type: none"> No warranty provided
Quality of test	<ul style="list-style-type: none"> RDK Test Development Kit is available to use 	<ul style="list-style-type: none"> AOSP has a comprehensive test suite to test ports
Configuration management	<ul style="list-style-type: none"> RDK is released on a fortnightly basis with major release of features approximately each quarter. RDK Code Management Facility provides transparency on code changes and facility to contribute fixes/features 	<ul style="list-style-type: none"> The AOSP is managed by Google and releases are very well controlled. Major release once a year with previews for developers. AOSP provides tools to comment on changes and fix bugs. Google has right to change anything it wants in codebase
Security	<ul style="list-style-type: none"> Mechanisms/technologies like Linux Containers, SVP, intrusion detection, secure sockets, obfuscation of critical data and addressing all vulnerabilities found through various penetration tests, port scans, and code scans 	<ul style="list-style-type: none"> SELinux and standard Android mobile security features. Regular security fixes
Documentation	<ul style="list-style-type: none"> Requires RDK license 	<ul style="list-style-type: none"> Most freely available online
IPR specifics	<ul style="list-style-type: none"> No coverage for IPR. No claims on added features 	<ul style="list-style-type: none"> No coverage for IPR except for Google components. No claims on added features in AOSP
Open source software (OSS)	<ul style="list-style-type: none"> No additional cost after signing RDK licence No obligation to distribute sources 	<ul style="list-style-type: none"> Android uses OSS components but without significant cost implications such as obligation to distribute full sources
CA/DRM integration costs	<ul style="list-style-type: none"> PlayReady, Widevine available with RDK License Other integrations available from DRM vendors DRM MSE/EME integrations could be done (3-6 months) using Crypto API and using CDM interface 	<ul style="list-style-type: none"> PlayReady and Widevine are available from Google for AndroidTV. Other integrations available from DRM vendors
Certifications	<ul style="list-style-type: none"> No RDK certification required. The operator manages the RDK code that they utilize 	<ul style="list-style-type: none"> Google components requires certification and also that the device conforms to the CDD (Compatibility Definition Document)

SUMMARY FOR VIDEO OPERATORS

	RDK	Android TV
User Experience	<p>Strengths</p> <ul style="list-style-type: none"> • There are some high quality vendor-provided UX • The UX can be completely defined by operator • Comcast X1 shows that it is possible to build a state-of-the-art, attractive and full-featured UX on RDK <p>Weaknesses</p> <ul style="list-style-type: none"> • There currently is no standard UI technology and requires investment either via development or with 3rd party suppliers to create applications • Access to a modern attractive UI is not off the shelf • No Appstore model to load other Apps such as YouTube or Netflix. This can create expensive custom integrations with other services for proprietary platforms or requirement to source vendor frameworks • Lack of 3rd Party Apps may make the CPE look dated 	<p>Strengths</p> <ul style="list-style-type: none"> • Allows subscriber to use Apps from Google Play store – this eliminates expensive custom integrations • Allows an attractive user interface using java technology • For smaller operators, access to a modern attractive UI is desirable and is less expensive than with traditional STB middlewares • Attractive features such as Google Assistant <p>Weaknesses</p> <ul style="list-style-type: none"> • Android TV assumes certain UX paradigms which might not suit existing backend and distribution mechanisms • Android TV is available on very cheap devices and there may not be enough differentiation between these and premium devices in consumers’ eyes
Business Strategy	<ul style="list-style-type: none"> • RDK has no revenue sharing implications • Provides quicker time-to-market for development of lower layers of software platform • Creates opportunities to play beyond traditional video services (home and security automation) if you follow complete RDK architecture (modem plus gateway plus IP clients) • No fear of disaggregation of brands and channels as RDK currently takes no role in applications • It is possible to completely restrict Apps which provide access to pirated content • The RDK platform is used by some of the largest operators including many major US and European operators • RDK provides an ecosystem of open source for STB, modems, cameras, advanced remotes • Has attractive roadmap which tracks the advanced features of an innovative MSO 	<ul style="list-style-type: none"> • Platform with little consumer choice – there is limited capability to reconnect with cord-cutters without 3rd party support • Limited formal SoC support reduces hardware options
Operational Considerations	<ul style="list-style-type: none"> • There can be cost efficiencies for a highly scaled platform such as RDK • Lower OPEX due to lower cost for CPE maintenance, free platform support resources and a wide pool of developers • DK supports high quality CA and DRM systems 	<ul style="list-style-type: none"> • RDK platform fragmentation needs to be managed carefully – upgrade plans should be in place – and diversity from main RDK source needs to be limited • RDK does not cover managed IPTV • RDK doesn’t provide any backend or cloud components though these may be made available in near future • You can expect to do some localisation of RDK for your market if you are first to use RDK solution in that market
		<ul style="list-style-type: none"> • Provides faster time-to-market for off-the-shelf features • Opportunities to play beyond traditional video services • By allowing other services you can retain control of HDMI-1 • Cost efficiencies – highly scaled platform • Platform with consumer choice will reduce churn • Revenue share possible with operator on Search and Play Store for non-operator Apps – subject to separate agreement • Wide choice of SoC support
		<ul style="list-style-type: none"> • Google has influence over your business through its roadmap and the architecture of the features • There is little control over what Apps are downloaded from Play Store and run on CPE – unwelcome competitors can appear overnight • Possible disaggregation of brands and channels • Google Search and Google Assistant are wide-ranging features which can grow extensively and competitively with addition of AI • Access to Apps which provide pirated content is a problem
		<ul style="list-style-type: none"> • Lower OPEX due to lower cost for CPE maintenance, lower UI costs, free platform support resources and a wide pool of developers • High quality development environment • Android provides a good security model and DRM systems are integrated to protect content
		<ul style="list-style-type: none"> • There are concerns over wide surface area of Android for piracy and cybercrime • Not possible to get Android versions older than 2 years certified • AndroidTV not intending to cover country specific features e.g. parental controls, preferred languages etc. • Android does not cover managed IPTV • Traditional CAS integration depends on 3rd parties • Steps must be taken to prevent Piracy-related Apps such as KODI running

CON CLU SION

The video operator CPE has evolved greatly over the years and is ready for its next great change into an open platform.

Operators can use the CPE as a driver of new services in their battle with Digital Disrupters.

Both RDK and Android provide excellent starting points for new CPEs.

Operators with large service organizations will find CPE centric services a driver of growth especially in Home 2.0 offerings such as SmartHome.

100 DAYS OF ACTION

Develop Service Roadmap for next 5 years.

Develop Deployment Model for each Service.

Understand opportunities for B2B2C partnerships with open platforms.

Estimate CPE current cost according to our 16 point model for deployment of new services.

Show how open platforms can save CPE opex and capex while deploying a wide range of Home 2.0 services.

Plan first steps of platforms demonstration and proof-of-concept of new services using an open platform.

ABOUT ACCENTURE

Accenture is a leading global professional services company, providing a broad range of services and solutions in strategy, consulting, digital, technology and operations. Combining unmatched experience and specialized skills across more than 40 industries and all business functions - underpinned by the world's largest delivery network - Accenture works at the intersection of business and technology to help clients improve their performance and create sustainable value for their stakeholders. With approximately 425,000 people serving clients in more than 120 countries, Accenture drives innovation to improve the way the world works and lives. Visit us at www.accenture.com.

ABOUT ACCENTURE DIGITAL VIDEO

Accenture Digital Video is an Accenture business unit focusing on helping companies build successful digital video businesses by enabling them to capture new growth opportunities while maintaining profitability in their traditional business in a rapidly changing market. Working closely with clients, Accenture leverages a portfolio of highly relevant integrated business services enabled by open technology platforms to deliver successful video business outcomes; from thinking to planning to doing. A global industry leader, Accenture Digital Video has a 20 year track record of advancing video technology and business innovation, supported by a global workforce of more than 2,000 dedicated professionals helping clients succeed in a complex, volatile landscape. Visit us at www.accenture.com/digitalvideo

CONTACTS

For more information please contact:

Robert Colbert

Principal Report Author
Europe CPE Consulting Lead
robert.colbert@accenture.com

Ian Harris

NA CPE Consulting Lead
ian.harris@accenture.com

Williams Guitton

APAC CPE Consulting Lead
williams.guitton@accenture.com