



High performance. Delivered.

RDK Management LLC

Accelerating Customer Premises Equipment Deployment

Innovation in the use of automation and
continuous integration practices in the
management of multi-contributor source code

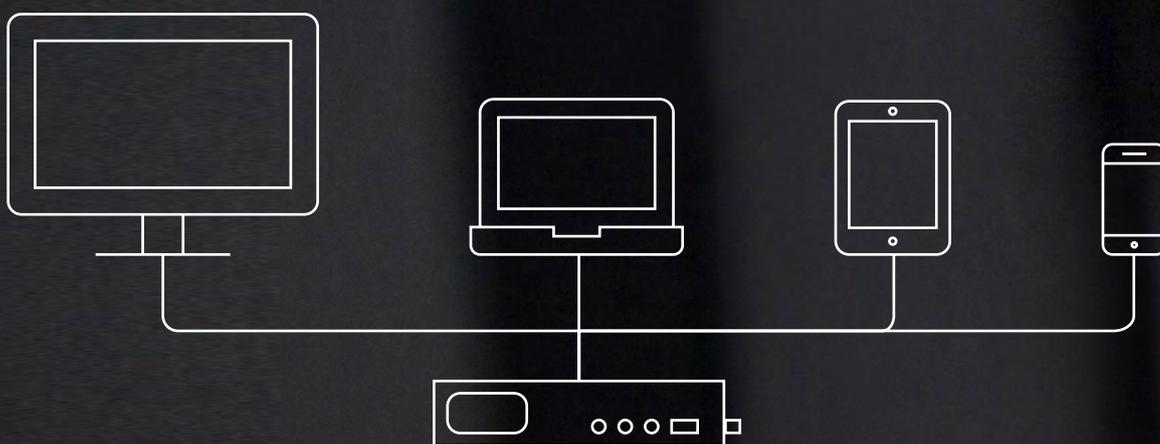

accenture

RDK
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Innovation in the use of automation and continuous integration practices in the management of multi-contributor source code.

The Reference Design Kit (RDK) is an open software bundle that provides a common framework for powering customer premises equipment (CPE) for TV and Internet service providers. RDK-V (video) provides a common method to manage various video functions on set-top boxes, while RDK-B (broadband) provides common methods to manage complex broadband functions on gateways. Critical to the RDK community of more than 275 companies is the ability of members to confidently rely on the stability and integrity of RDK code releases.

Accenture Digital Video designed and operates the RDK Code Management Facility as a fully managed service for RDK Management LLC. In this role Accenture Digital Video has deployed modern, continuous integration using high quality tools and automated processes to rapidly integrate code contributions from a global community, help ensure code integrity, and provide control of official software releases.





CODE MANAGEMENT

At the most basic level, code management provides file management and version control so that developers don't write over each other's changes, and only the newest versions of files are identified for use in the workspace.

But that's only the beginning. It also give developers the ability to work concurrently on files (in branches that may or may not converge), to merge changes with other developers' changes, to track and audit changes that were requested and made, to track bug-fix status and to perform releases.

The criticality of code management

RDK Management LLC is a joint venture of leading pay TV operators created to administer the Reference Design Kit (RDK). It is responsible for the RDK-V and RDK-B software stacks, which are standardized, royalty-free, software bundles designed to provide a common framework for powering CPE.

RDK Management LLC enables operators to change the way the TV industry develops software and accelerate feature development for CPE platforms. RDK software development is based on rapid and continuous incremental improvements from the open source community. By using RDK as a foundation, Video Service Operators (VSOs) and Broadband providers can shift their individual development efforts to application and services innovation.

Critical to RDK Management LLC's success is that the developer and customer community has confidence in the stability and integrity of the RDK codebase. With community members directly driving the addition of new functionality to the RDK

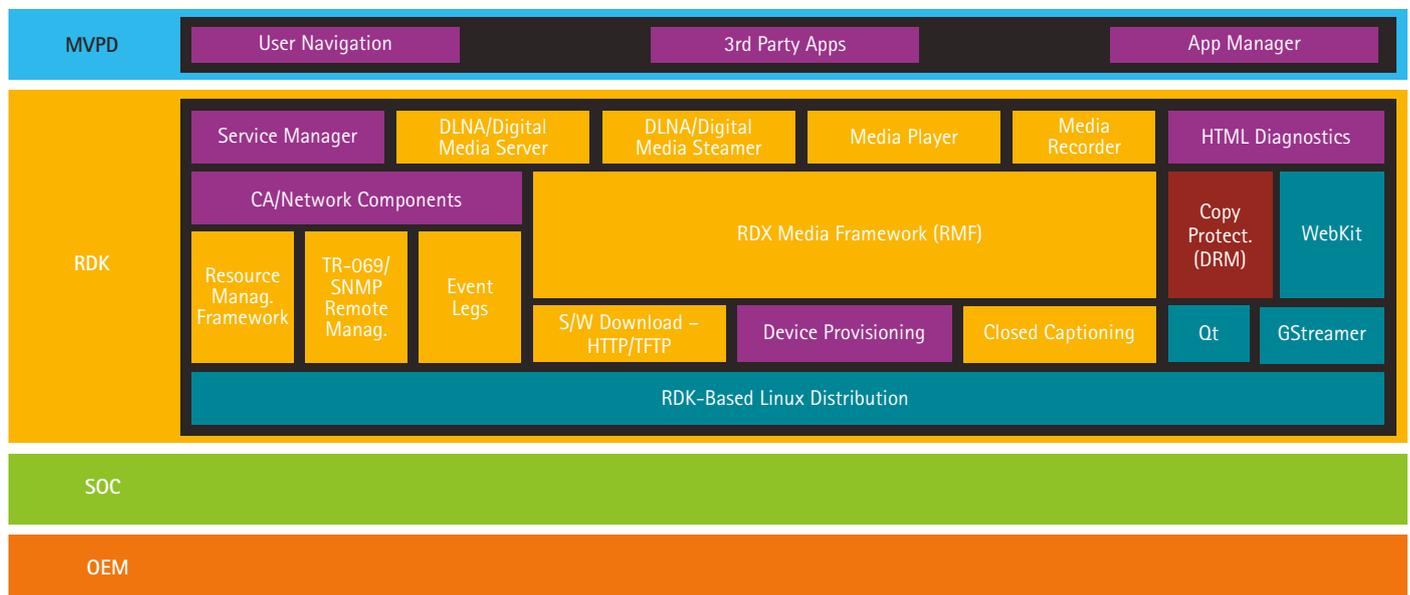
software, it is important that the code submission and integration processes be efficient and transparent. Community members need to be able to access the latest version, contribute their changes, track their contributions through review and receive approved releases of the RDK code 'trunk'. Further, for the code to be relied upon by leading organizations, its compliance with open source licenses needs to be routinely verified.

To deliver on these core elements in an environment with many community contributors, millions of lines of code, and multiple branches to merge into the official repository, RDK Management LLC needed a robust, secure, scalable, and trusted approach to code management.



"With Accenture Digital Video we have deployed a continuous integration process that accelerates release frequency and improves code quality."

Steve Heeb, President and General Manager of RDK Management, LLC



An innovative solution for multi-source code management

Accenture Digital Video worked closely with RDK Management LLC to establish a Code Management Facility capable of securing, coordinating and managing the official code base. The use of the elastic compute capacity of the cloud was an important component enabling the RDK codebase to be compiled cost-effectively.

The RDK Code Management Facility is defined by its innovative use of automation, and modern continuous integration practices, to support multi-party contributions. From the initial code migration through today's operations, the project relies on automating as much of the code management processes as possible, using Automated Configuration Management.

Similar to other open source initiatives, RDK code contributions are visible to all members of the community, who are able to comment, review and modify the code. The code goes through a continuous integration process including being tested across multiple device platforms prior to release. RDK maintains a bi-weekly iteration release schedule.

A core innovation is the workflow management between related processes. Open-source tools including Gerrit, JIRA, and Jenkins are integrated to facilitate seamless collaboration between components. This significantly reduces the workload

and time to ingest, assess, merge, and test prior to contributions being made available as part of the official release. The solution also integrates with open source license compliance checking software, as remaining compliant with the wide range of open source licenses is vital for RDK Management LLC's global user base.

Prior to release, contributions undertake a process that involves:

- Community contributions being pushed for review by component owners
- Automatic kick-off of build for all target build variants, flagging any errors
- Code being automatically scanned to verify open source license compliance
- Download of build images to set-top-box targets
- Execution of relevant test sets on automated test racks
- Test results and reports generated and distributed

"Stability and integrity of the code is essential to the RDK program. Accenture Digital Video's robust Code Management practices ensures members can access the latest version, contribute their changes, track their contributions through review and receive approved releases of the RDK code trunk."

Steve Heeb, President and General Manager of RDK Management, LLC

High Performance Delivered

The RDK Code Management Facility is a fully managed service operated by Accenture Digital Video. Through this approach Accenture Digital Video can help ensure that contributions to the common code base are carefully assessed, merged, and tested prior to being made available as part of RDK releases.

Thanks to the ability to access the RDK source code, operators can often fix issues in less time than it used to take to schedule a meeting with all of the relevant vendors. Operators are adopting continuous integration processes where the operator and all key stakeholders (OEM, SoC, Systems Integration, and UI teams) have source code visibility on RDK devices. This transparency enables all parties to identify, isolate, and fix code issues at a pace previously not possible.

The Code Management Facility can scale to handle a very large code base, simultaneously support large numbers of geographically distributed users to evolve the code, and provide a clear audit trail of status and code progress.

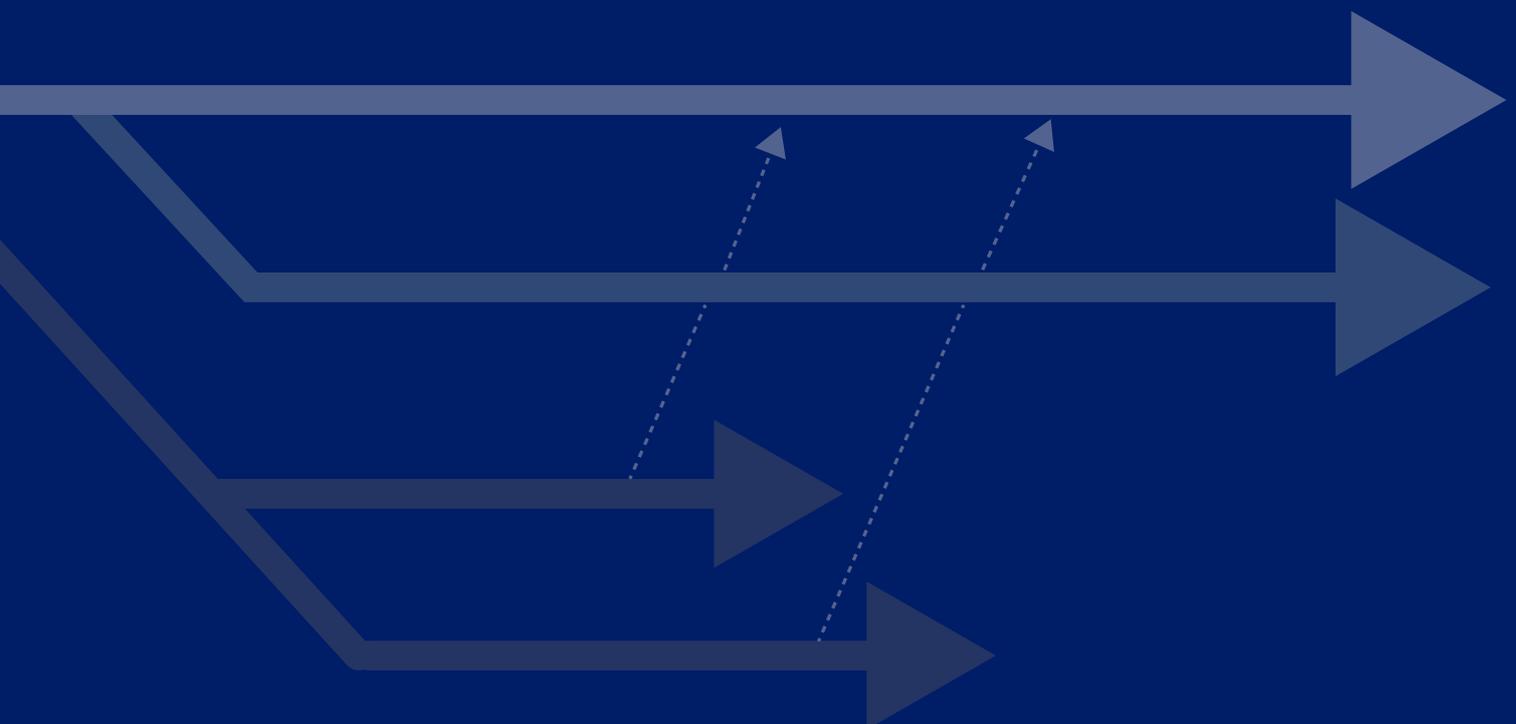
Through this solution RDK Management LLC now has several advantages:

- Fast market responsiveness through rapid integration of new features into RDK while maintaining secure

and controlled collaboration across on- and off-site engineering teams. There are now RDK code releases every two weeks compared to software cycles that previously could take months or years.

- Strong code compliance and control that supports multi-party vendor and community sourced code contributions while maintaining a clear audit and license compliance trail
- Efficient code management that helps reduce the effort and cost associated with building, testing, merging and releasing software

By building a code management platform that uses the recommended practices of agile development, automation, and collaboration RDK Management LLC is delivering on its mission today while future-proofing its operations to meet the needs of its members as the digital video industry rapidly evolves.



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 more than 375,000 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.

Accenture Digital Video

Accenture Digital Video is a business unit within Accenture. We deliver business results for companies where video is of strategic importance, helping them pivot to capture new growth opportunities in an ever changing market. Partnering with clients, we use our agile methodologies, deep skills, and open technology platforms and apply them in every phase of a change journey—from thinking to doing. The end result: more predictability in the face of a complex and volatile landscape. Accenture Digital Video has a 20 year track record in driving video innovation through a global workforce of more than 2,000 dedicated professionals across strategy, delivery, business services and operations, all dedicated to helping clients grow profitably.