

GlobalLogic®



An Approach to Implement Media Automation Testing

by Nilesh Kumar, Automation Testing, GlobalLogic

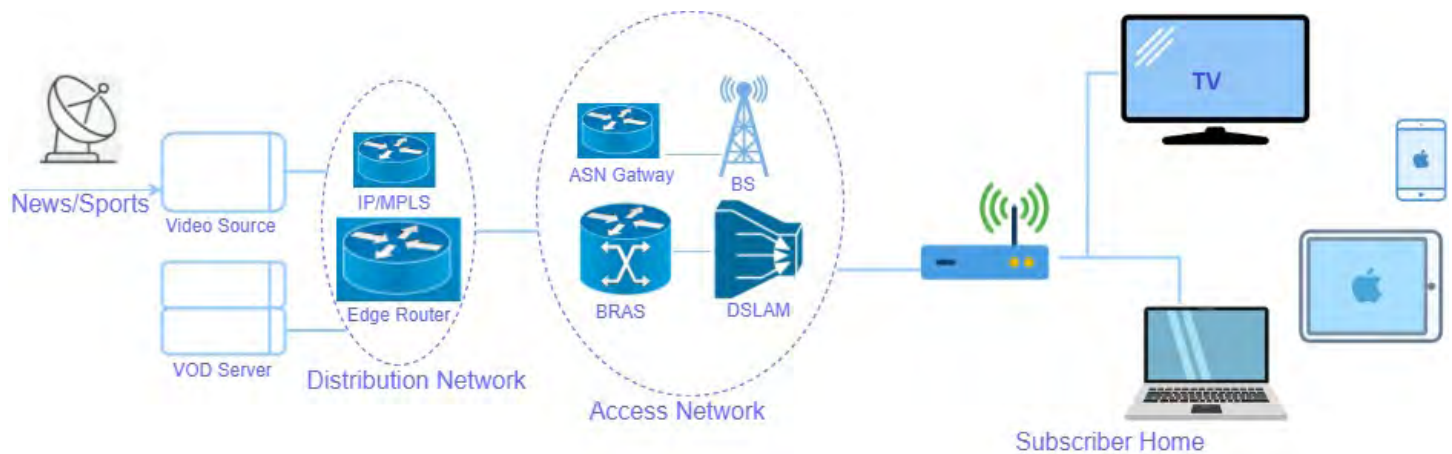
Contents

Architecture of a Typical IPTV/OTT Platform	1
Requirements for Media Automation	2
Industry Standard Tools for Media Automation	4
Challenges in Media Automation	4
Proposed Solution	5

Automated testing in IT is necessary in order to provide quality software/applications for enterprises or public-facing applications. The media industry is no different. Its automation requirements are increasing with the advent of multiple IPTV and OTT service providers trying to gain a large foothold in media streaming solutions.

Testing these applications manually has become a challenge, and there is no dedicated automation testing tool available which covers all areas of media automation.

Architecture of a Typical IPTV/OTT Platform



Main components of IPTV/OTT platform:

- Content acquisition and aggregation
- Content encoding, DRM, IP encapsulation
- Central VOD management
- Headend
- OSS/BSS management
- Set-top box: IPTV client, DRM, video decoder
- Subscriber identification
- Settings and personalization
- Premise storage, PVR
- Other triple-play services

The set-top box (STB) has a built-in HTML browser and MPEG-4 player. STB works as a web client for content services like VoD portal or interactive services like iVoD. HTML pages sent to the STB are dynamic, running Javascript. Client-server interactions are Ajax-like.

Requirements for Media Automation

Media automation includes different types of testing over various devices:

1. Functional application flow testing: Includes validation of application flow. For example, if a user hits the play button for content, the application should play the content.

2. Performance Testing: Load testing, End User KPI testing

3. API Testing

4. Content Testing and Quality: The quality of the consumer's video is not just a function of the network bandwidth (ADSL2+/ADSL) or the data stream. A number of parameters contribute to the customer's perception of good vs. bad quality.

In a generic IPTV configuration from the Digital Subscriber Line Access Multiplexer (DSLAM) to the customer premises, ADSL2+ from the IP -based DSLAM delivers data flow in the video stream to the user's ADSL2+ broadband router. While supporting voice and internet services, the router passes the video stream to the STB for decoding. The STB converts the video stream into required signals for displaying on the consumer's TV.

Some of the parameters that influence the customer's user experience include image pixelation and tiling, picture blurring, macro blocking and edge distortion, and audio dropouts and channel-change time. Some of the quality parameters for testing could be searchable, playable, audio/video presence, MOS, etc.

5. DRM Testing: Validate whether the content is DRM-enabled or not. If a user tries to download the content, it should download but instead display a warning message. Downloadable contents should be encrypted and should not play except through an authorized player.

6. Compatibility Testing: The application should work on all supported device types, OS versions, and browser versions.

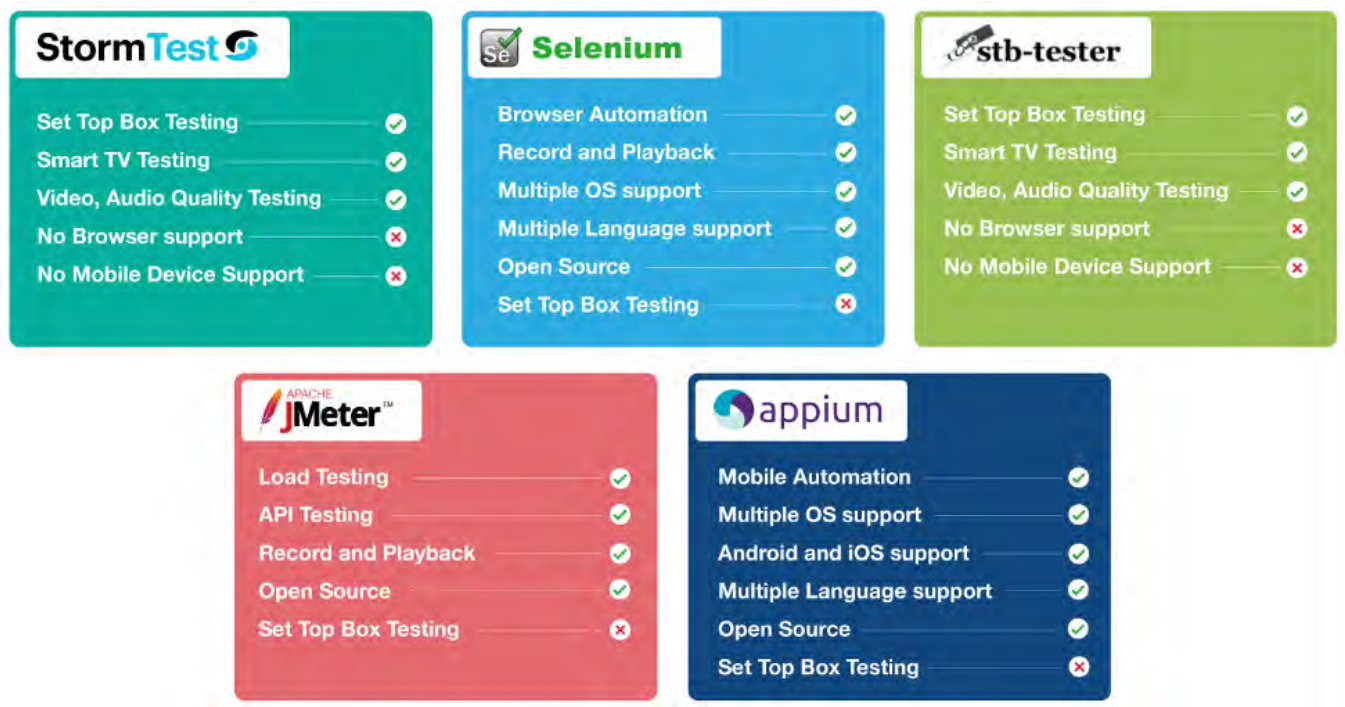
7. Set-Top Box and RCU device Testing: When a user presses the desired key on a remote control, this action should produce the desired action on the output device like a television or a display panel. For example, if a user presses the 'Home' button, the home menu should appear on the TV.

8. Billing Validation for Subscribed Services: The user should see subscribed services only if the user opts for VOD or any other service billing and should be updated to reflect the change.

OS and Device Type required: Android Mobile Devices, iOS Mobile Devices. Web Browsers , Set-Top Box/, Android-Based STB Client, Smart TV

Industry-Standard Tools for Media Automation

There are various tools available for media automation, and each tool has advantages and shortfalls.



1. StormTest

StormTest is a video service test automation platform. It addresses the complexity inherent in modern video software delivery by enabling test-to-scale intelligently, simultaneously supporting the validation of multiple builds and releases across platforms.

Supported Device: Set Top Box
Programming language: Python

2. STB Tester

Stb-tester issues commands to device-under-test in the same way a real user does (typically using an infrared remote control). Stb-tester then checks the behavior of the device-under-test by analyzing the device's video output, validating what a real user would see.

Supported Device: Set Top Box, Smart TV
Programming Language: Python

3. Selenium

Selenium is one of the most popular tools for automating web applications for testing purposes. Businesses can automate web-based administration and tasks, as well.

Supported Device OS: Windows, MAC, Linux

Browsers: Chrome, Edge, Internet Explorer, Safari

Programming Languages: Ruby, Python, Java, JavaScript, PHP, C#

4. Appium

Appium is an open-source test automation framework for native, hybrid, and mobile web apps. It drives iOS, Android, and Windows apps using the WebDriver protocol.

Supported programming languages: Ruby, Python, Java, JavaScript, PHP, C#

5. Jmeter

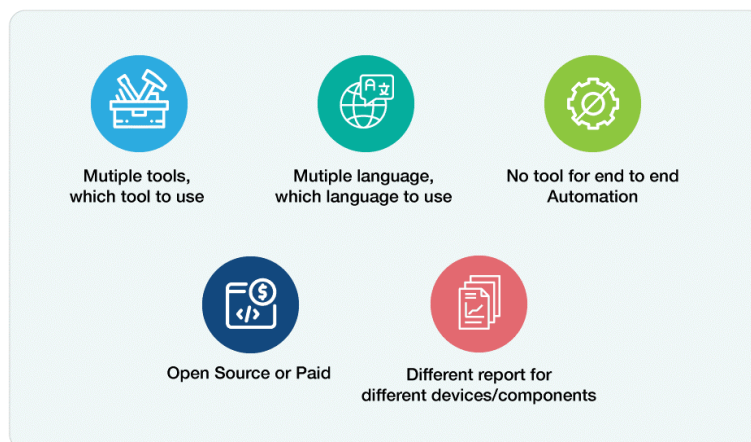
The Apache JMeter application is open-source software and a pure Java application designed to load test functional behavior and measure performance.

OS: Windows, MAC, Linux

Programming Language: Not dependent on any language

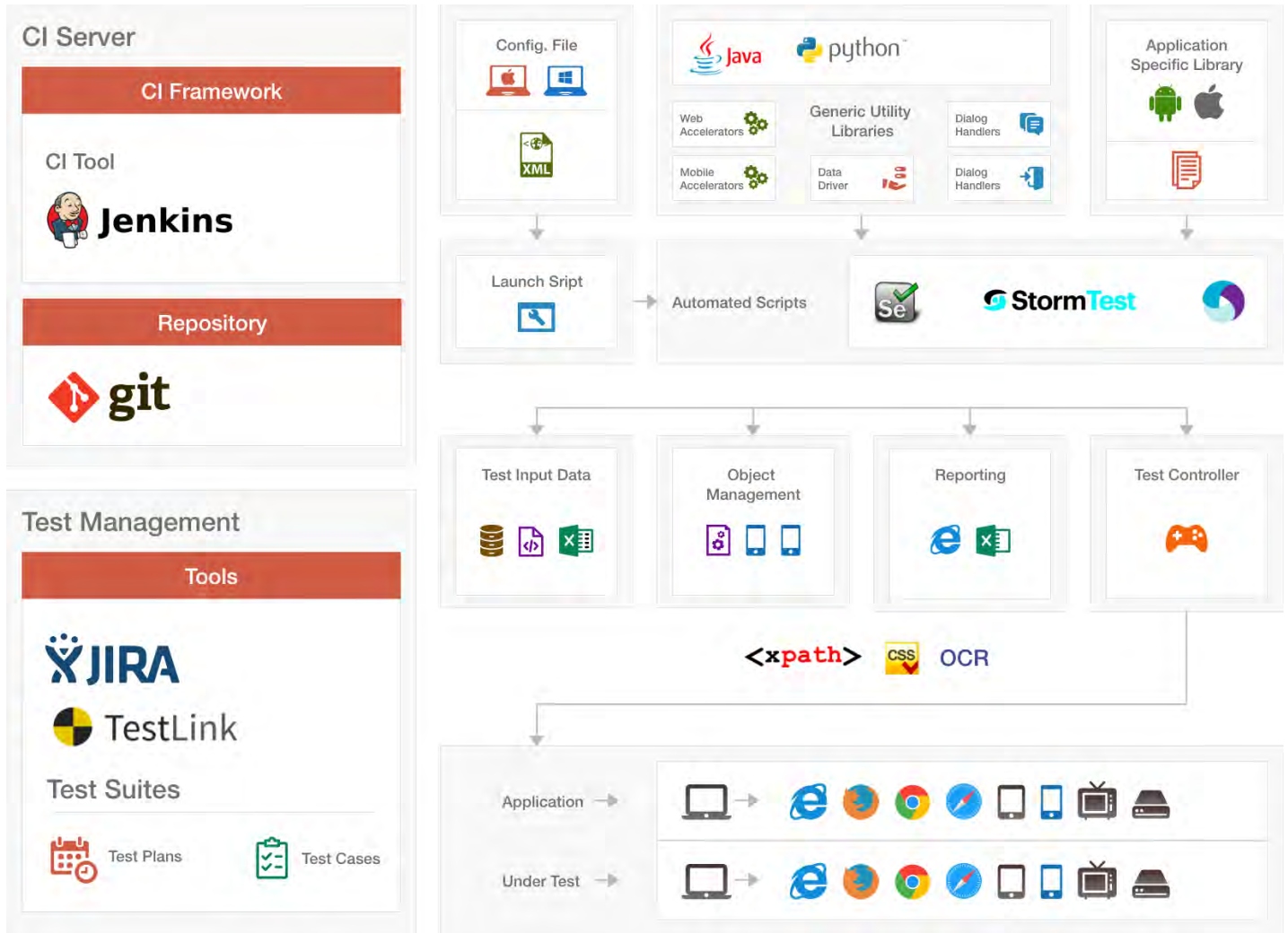
Challenges in Media Automation

All of the above tools support specific components or devices. Just as Selenium supports browser automation, Appium supports mobile app automation, StormTest and Stb-tester support set top boxes and smart TVs, and Jmeter supports API load testing. None of these tools supports end-to-end testing of media/IPTV applications.



Proposed Solution

We need to build customized automated testing solutions on top of industry-standard tools. There is no single application/library available in the industry which can cover all the above aspects of automation testing for the media industry. Sample architecture follows:



We can define pluggable components for each module/device type automation. We have selected Java as the preferred language for this framework as it meets the requirement for Web, Mobile, and API automation. A set-top box automation client library is available in Python, and we can use it with a wrapper, which will invoke the functionality internally.

Features of the proposed solution:

1. Simplicity.

We can develop test scripts with minimal development effort. Technical implementation details will not be required to create a test script.

2. Multiple device support.

The framework will support multiple form factor devices for effective automation.

3. Extensibility.

We can add new device/component support.

4. Multiple data sources.

Multiple data sources can be supported including Excel, database, text files, etc.. What's more, we can manage this as an independent layer that plugs into test cases at runtime for execution.

5. Device management.

We can manage devices as an independent component that controls all connected devices and checks their connectivity/health.

6. Configurable iterative execution.

We can configure the number of executions to mitigate the risk of environment-based temporary failures when executing further iterations.

7. Customized report.

Customized, detailed Excel reports generate, along with provision for email and HTML reports, irrespective of device and component selection.

About the Author

Nilesh Kumar is an Automation Testing expert with 14 years of Automation and Functional Testing experience. His domains of expertise includes IPTV, Real Estate, ECommerce, and Gaming.



GlobalLogic®

GlobalLogic is a leader in digital product engineering. We help our clients design and build innovative products, platforms, and digital experiences for the modern world. By integrating strategic design, complex engineering, and vertical industry expertise,— we help our clients imagine what's possible and accelerate their transition into tomorrow's digital businesses. Headquartered in Silicon Valley, GlobalLogic operates design studios and engineering centers around the world, extending our deep expertise to customers in the communications, automotive, healthcare, technology, media and entertainment, manufacturing, and semiconductor industries.



www.globallogic.com