

The Java Stream Assembly: Reducing the Cost and Complexity of Delivering Media Services



The high cost of equipment, the risk and expense of integrating new components, and the difficulty in bringing new services to market—these problems are all too familiar to broadcast, on-demand, and interactive media service providers.

There are many contributing factors, not the least of which is the complexity of the task. But perhaps the most significant factor contributing to the problem is the lack of standardization.

While the transport formats are open standards, the components and systems that process those media streams are almost always based on proprietary architectures. The result is that equipment from different manufacturers often cannot be combined without costly and time-consuming integration work, and it is difficult or impossible to modify the behavior of the “black boxes” that comprise such systems without recourse to the original manufacturer. Even a seemingly simple task, such as adding an economical off-the-shelf storage device in place of an expensive proprietary one, can present prohibitive challenges.

The Java Stream Assembly (JSA) specification provides the common architecture that the industry is currently lacking. When systems based on the JSA become available, they will dramatically reduce the per-stream cost of delivering broadcast, on-demand, and interactive media, while simultaneously reducing time-to-market for new services and virtually eliminating the risk and expense of integrating new components.

JSA is a specification that was created under the auspices of the Java Community Process (JSR-158) by an expert group comprising various technology leaders in the domains of broadcast, on-demand, and interactive media and Java. JSA provides a clear specification and a robust API for designing and implementing components, adding new functions, and supporting new types of media, hardware, and services as they become available.

Abstract and Conquer

The first step is to create an abstraction of the media stream. JSA defines generic components known as stream sources, processors, and stream sinks, as shown in Figure 1.

As you can see from Figure 1, the media stream abstraction includes one or more processors between stream source and

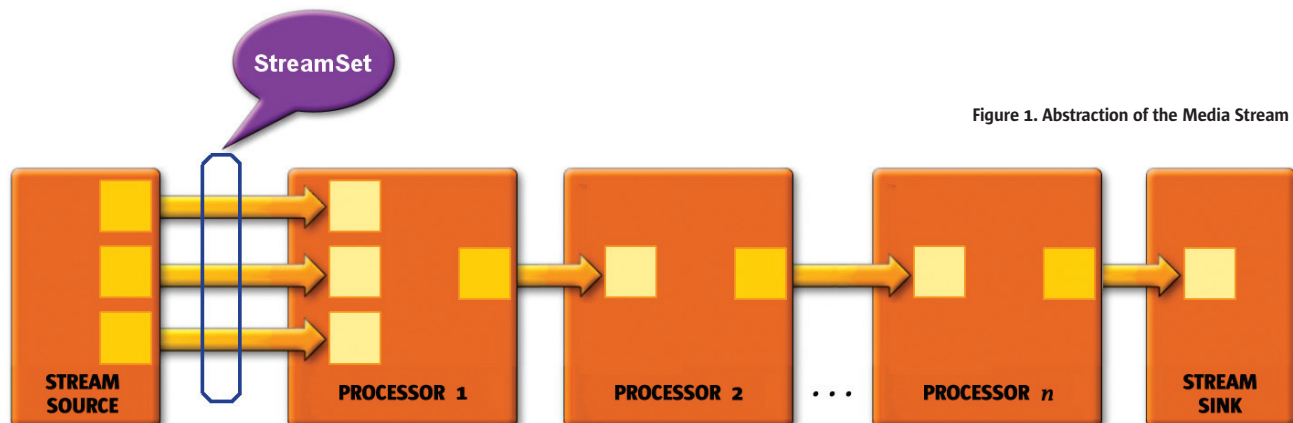


Figure 1. Abstraction of the Media Stream

stream sink. Processors route a media stream from a given stream source to a given stream sink, and may in addition perform manipulations on the media stream before passing it on. Examples of common manipulations include pairing a video stream with a different audio stream, overlaying text or graphics on a video stream, enabling on-demand video streams based on program logic, presenting a menu to accept input from the viewer, and so forth.

The evolution of the media stream in some ways parallels that of the Web page. Just as the Web page started with static HTML and evolved to include multimedia and highly interactive applications delivered as byte code, simple broadcast video has evolved to include on-demand video and interactive television (ITV). Until now, each step along this evolutionary path required service providers to purchase a whole new generation of specialized hardware. Systems built to the JSA specification allow service providers to add new

services much more easily, and at a fraction of the cost.

Components can take any form and perform any function so long as they use the standard JSA interfaces. That is, a component can be separate physical device such as a storage device or storage area network (SAN), a specialized circuit board, or a computer application.

Figure 2 shows where the JSA fits into a typical digital head-end installation.

Good News for Service Providers and Component Vendors

If you are a service provider, JSA offers you more performance, more flexibility, and more control, while reducing the cost of equipment, integration, and development. Service providers have everything to gain from an industry-wide adoption of the JSA standard. By adding JSA compliance to your system requirements, you will help speed the

pace of JSA adoption and help your own bottom line.

If you are a component vendor or system integrator, JSA offers significant savings. Integrating new components with other components, and with back-end/office and asset management systems, is time-consuming and expensive. With JSA, you perform the integration once and never have to deal with it again. Furthermore, JSA localizes dependencies at the component level, so you can concentrate on developing your component's functionality without worrying about how it will interact with other components. The result is significant development and integration cost savings, and faster time to market.

The JSA has been approved for public review. For further details, you can go to <http://jcp.org/en/jsr/detail?id=158>

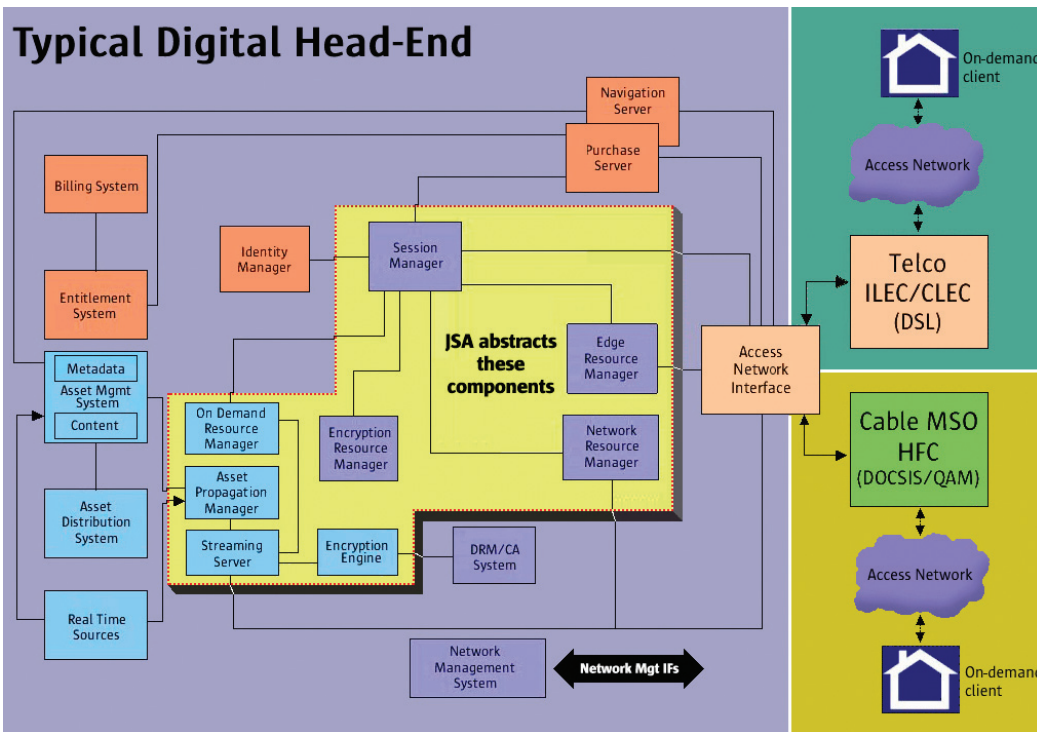


Figure 2. Where JSA Fits in a Typical Service Delivery System

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