SONY ELECTRONICS INC.

SONY

FREEDOM TO CHOOSE

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FREEDOM TO CHOOSE

Executive Summary

Sony's *Passage*™ technology is a simple, elegant solution that allows equipment from multiple vendors to peacefully co-exist on legacy digital CATV networks. *Passage* technology is based on a fundamental understanding of MPEG encoding, and years of Sony experience developing digital video products.

Passage facilitates choice in equipment and services. With *Passage*, operators can introduce alternate conditional access systems, innovative set-top boxes, headend equipment from multiple manufacturers, and advanced subscriber services. Not only does *Passage* technology enable choice, it also drives competition.

Passage is efficient. With *Passage* technology, the customer experiences no degradation of existing services. A typical *Passage* system requires between 2-10% additional bandwidth to deliver the same content and services including the new, second Conditional Access (CA) system. This means that *Passage* can be introduced in a system without changes to the existing channel line-up.

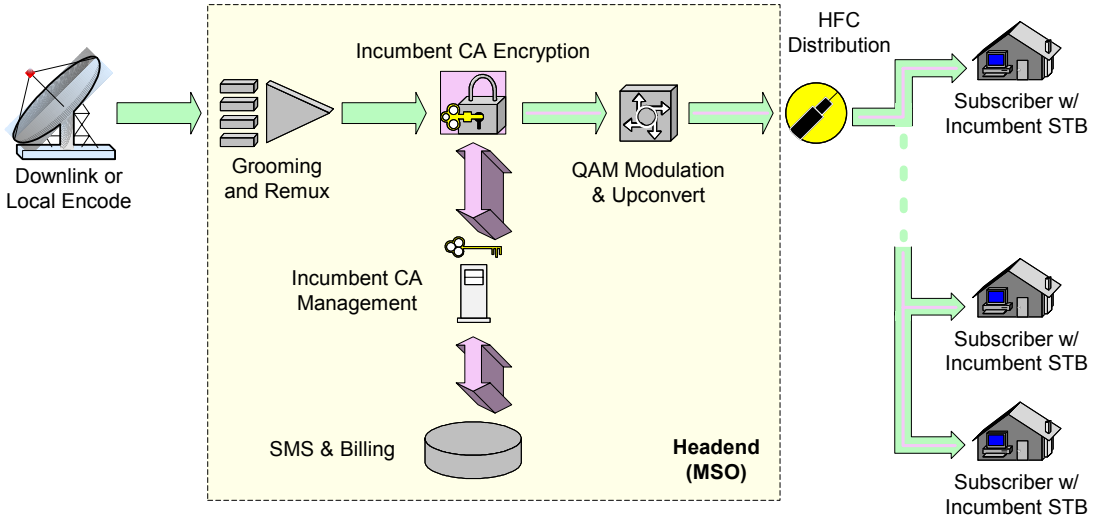

Figure 1 – Typical Digital Cable System Architecture

Passage Technology

Passage is Sony-developed technology that enables equipment from multiple vendors to be deployed on legacy digital cable networks—without the need to duplicate content or bandwidth.

Sony has applied the knowledge gained from years of experience in a variety of digital video products to approach the digital cable market from a fresh and unique perspective. *Passage* is derived from a fundamental understanding of what digital encoding, especially as implemented by the MPEG specification, actually represents. *Passage* technology recognizes MPEG compression as a form of encryption.

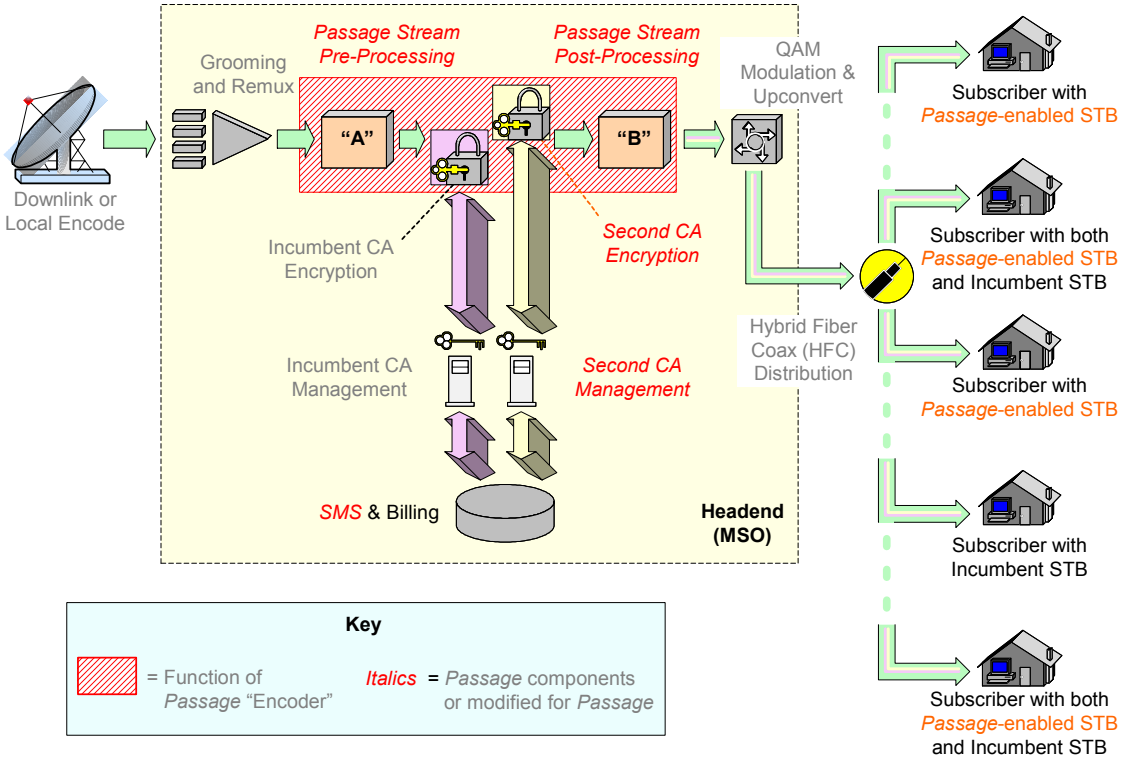

Figure 2 – *Passage*-enabled Digital Cable System

Passage technology supports multiple CA systems, and it treats each CA system independently. *Passage* allows each CA system to operate on its own encrypted data. As explained in more detail later, *Passage* encoding carefully chooses the data that is encrypted. This process allows multiple Conditional Access (CA) systems to co-exist in an existing cable plant.

Passage technology supports DVB open standards. Sony extended the DVB open standards to allow communication to the *Passage* encoding device. Support of DVB open standards allows interchangeable headend equipment operation, and interoperability of multiple CA systems.

New equipment adhering to the open standards architecture will process the data encrypted by the alternate CA. At the same time, the legacy equipment, using proprietary methods, processes the data encrypted by the legacy CA as before.

System Architecture

The *Passage* system architecture enables the deployment of field-configurable, modular systems. *Passage* technology also avoids the geographical or spectral partitioning usually required when introducing non-legacy components to an existing plant and the licensing or interoperability problems associated with multiple CA systems. With *Passage* technology, there is no need for key sharing or CA licensing.

Vital data, essential for decoding, is selected, duplicated, and encrypted in two ways: once for legacy STBs and once for *Passage* STBs. Each STB receives the same transport data and appropriately selects its encrypted data. The remaining content is shared by all STBs. Only the critical data necessary for recovering video or audio content needs to be encrypted. The *Passage* system only encrypts critical data. If a decoder cannot receive the critical data, then the video image cannot be decompressed.

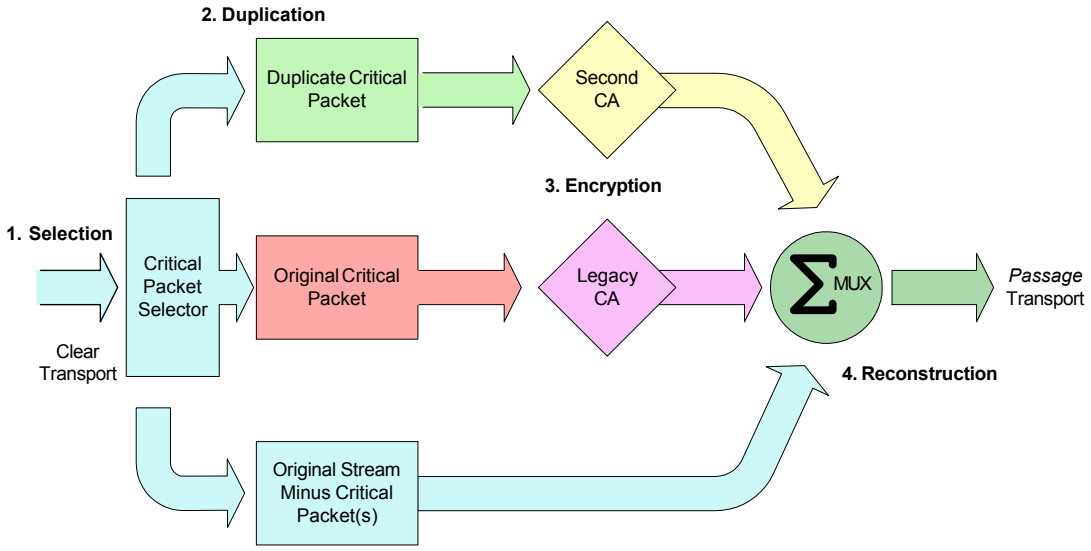

Figure 3 – The Headend Encoding Process

Managing Bandwidth

Passage recognizes that content might be treated differently based on the value of the content. With this in mind, *Passage* is designed to allow the Cable Operator to adjust the level of encryption on a per-channel and program-by-program basis. *Passage* allows the Cable Operator control over packet encryption. The algorithms designed by Sony that choose critical data are hierarchical and progressive and can be changed at any time. In addition, the modes used on each program in a transport stream are completely independent of one another.

Thus a multiple-system cable operator (MSO) has the option of trading bandwidth for increasing degrees of robustness. The lowest level of *Passage* encryption provides protection against decoding by commercially available MPEG decoding devices. This mode carries the lowest bandwidth overhead, on the order of 2 percent. It is typically used on content such as syndicated programs.

More robust protection for content with a higher value—such as VOD, live PPV events, premium services, etc.—is provided with higher-level modes of *Passage* security. These higher-level modes carry a larger bandwidth overhead, to a practical maximum of 10 percent for combined audio/video (see Figure 4). No significant increase in robustness is gained when increasing the total *Passage* replicated packet bandwidth beyond 10 percent.

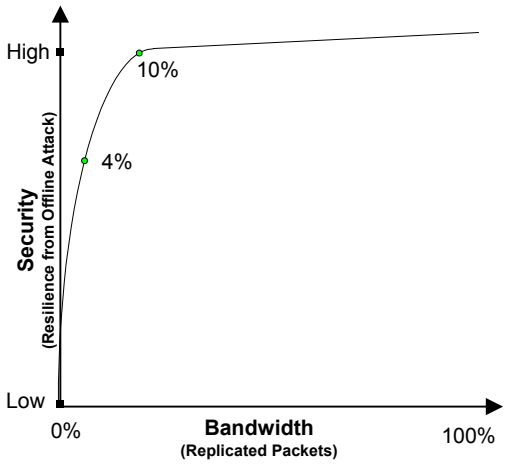

Figure 4 – *Passage* Bandwidth Usage

Implementation

Passage hardware components are implemented in both the headend and in every *Passage*-enabled set-top box, with the latter available from a variety of participating manufacturers. The following components are implemented as part of the *Passage*-enabled system.

- Headend encoder
- STB (decoder)
- Alternate CA encryption
- Alternate CA management

Passage technology is compatible with the CableLabs OpenCable™ initiative and can be implemented in a Point-of-Deployment (POD) module. *Passage* is positioned to deliver an open, competitive marketplace to the cable world.

Contact Information

E-mail: Passage@am.sony.com