Opencable – Opening Soon

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Abstract

An overview of the OpenCable project is presented, from its inception to the current status. The OpenCable process is described, along with its success in enabling the participation of multiple MSOs, traditional cable vendor companies, and non-traditional cable vendors from the consumer electronics industry. Recent interoperability testing is described which suggests that several vendor companies are likely to be certified OpenCable compliant in the next few months. Finally, some thoughts are offered on future developments.

OPENCABLE OBJECTIVES

OpenCable was conceived and launched in the summer and fall of 1997 in response to a number of industry and technology trends that were then working both for and against the interests of cable television system operators.

At the time, cable companies had placed orders for digital set-top boxes but were still waiting on delivery of boxes at price points that made economic sense. Part of the delay was deemed the result of a lack of sufficient competition among suppliers.

It was further noted at the time that the computer industry was riding extremely steep declining cost curves into an era of new growth and increased innovation. Further, the advent of the World Wide Web pointed to real consumer acceptance of interactive services.

A series of meetings coordinated by CableLabs between cable CEOs and Silicon Valley CEOs led to a belief that the convergence of the industries held the key to cable's future. At the same time, cable executives were wary of handing over the keys to this new engine of growth to another limited set of vendors. Thus, OpenCable was born.

One additional OpenCable objective is worth noting. Due to a clause in the Telecommunications Act of 1996, a requirement was placed on cable companies to enable retail distribution of "navigation devices". OpenCable was shaped in order to meet this requirement, not only for regulatory purposes, but also to enable cable companies to shift equipment investment off their books. Although the financial need to do so receded as cable company finances improved (in part due to investments in MSOs by Silicon Valley companies), the appearance and growth of direct broadcast satellite competition led to a need for cable companies to facilitate a competitive response in retail consumer electronics outlets.

OPENCABLE PROCESS

The cable industry announced an RFP for a design for next generation digital set-top boxes and other devices. The end result of the RFP process was not a selection of a single vendor solution, but a realization that there was enough commonality in the approaches for the cable industry to seek to drive the creation of an open specification.

The OpenCable process is modeled on the highly successful DOCSIS, Data Over Cable

System Interface Specification, which has to date certified cable modems from 17 different companies. Some key aspects of the DOCSIS process are directly relevant to OpenCable:

- A commitment to an open, collaborative process.
- Inclusion of vendors as specification authors and true partners.
- A neutral venue for development work.
- A feedback loop between equipment development and refinement of specs.
- And building a strong consensus within the cable industry on cable's requirements.

The first step was the development of a specification outline, as illustrated in Figure 1.

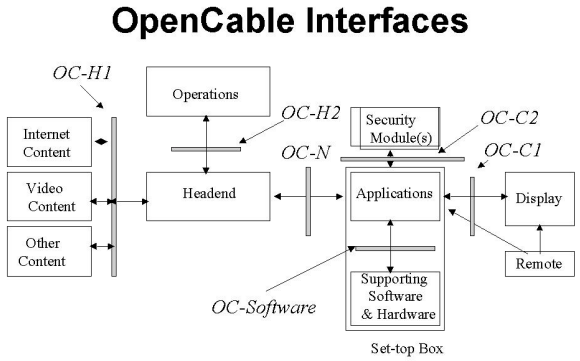

Fig. 1

The next step was to solicit vendor authors, who ultimately came from such diverse companies such as Sony, SCM Microsystems and Time Warner Cable. Authors prepared draft documents, and then submitted them for review by cable MSO representatives. Once a cable industry consensus was reached, documents were put out for further review by all interested vendor companies who signed a non-disclosure agreement (promising not to publish draft documents.) There are currently over 400 vendor companies that are involved in this process. Finished specifications are then submitted to SCTE and other standards organizations for due-process standardization.

1394 INTERFACE WITH 5C COPY PROTECTION

The interface between the set-top box and the consumer device, such as a television, turned out to be a point of much controversy. Hollywood studios expressed to cable companies their concern that a digital interface between a digital set-top and a digital television meant the appearance of a digital video stream in the clear, a tempting target for pirates who would then have a pristine copy for further duplication.

Cable, Hollywood and consumer electronics companies settled on a 1394 interface with so-called 5C copy protection as a viable solution. This technology was written into the OCI-C1 specification, also known as the Home Digital Network Interface, shown in Figure 2.

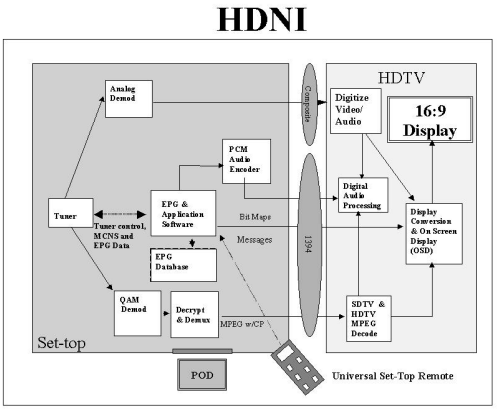

Fig. 2

POD MODULE

A second area of the OpenCable specification that occupies a central role is the point-of-deployment security module, or POD module.

During FCC deliberations on how to implement the "navigation device" provision of the 1996 Telecommunications Act, the

concept of a removeable security module gained favor and was eventually written into the FCC's order implementing the provision.

The POD module was modeled on the NRSS-B standard for renewable security. The form factor is a PCMCIA card, chosen for renewability as well as being considered incrementally more secure than smart cards that were the basis of security in Europe. (See Figure 3.) PCMCIA cards also have the processing capability to handle complex out of band signaling protocols.

Fig. 3

INTEROPERABILITY TESTING

Following the successful process pioneered in the DOCSIS program, CableLabs began holding interoperability events as a way to assist developers in building products that could meet the OpenCable specification and eventually be certified.

The first interop event was held in July, 1999, and the second in December 1999. The December interop was then transported onto the exhibit floor at CableNET '99 at the Western Cable Show to offer industry observers the opportunity to see the progress of the effort. A third interop event was held at CableLabs in March, 2000. The companies that have participated in interops to date are shown in Figure 4.

Headend

DiviCom
Motorola
Scientific-Atlanta

POD Modules

Mindport
Motorola
NAGRA
NDS
SCM Microsystems (test tool)
Scientific-Atlanta

Host Devices

LG Electronics
MARGI Systems (test tool)
Microsoft/SCM
Motorola
Panasonic
Philips
Samsung
Scientific-Atlanta
Sony
Thomson
Zenith

Fig. 4

The most recent interop covered the following functions:

- Initialization Between POD module & Host
- Display A/V Decrypted by POD module
- Display of Closed Captions from MPEG
- Channel Change
- OOB Messaging between the Headend and POD module via the Host

- SI processed from the Extended Channel
- POD-Host Interface Encryption

These elements are a subset of the full range of features that will be part of the Acceptance Test Plan that will form the core of the OpenCable certification process. The first OpenCable certification wave, which will encompass further interoperability testing as well as certification testing, begins on April 10 and runs through May 19.

Based on the significant progress observed in the successful performance of many of the above items since the last interop in December, it appears that some POD module and host vendors may be certified in the very near future.

FUTURE DEVELOPMENTS

Vendors currently participating in OpenCable interoperability testing at CableLabs are mostly developing set-top boxes. However, one company did work on a television receiver integrating set-top functionality and the POD interface, while another developed an architecture that may allow a personal computer to function as an OpenCable host device. These two products illustrate the flexibility that the OpenCable platform holds for development of innovative products to which cable's broadband delivery system can deliver exciting new services. Figure 5 suggests the variety of devices that might eventually become certified as OpenCable-compliant and provide an array of new services to cable customers.

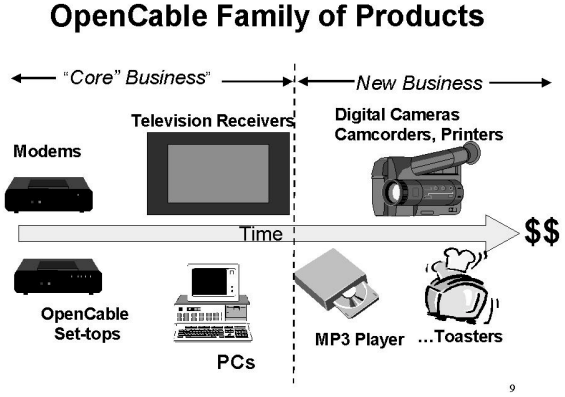

Fig. 5

OpenCable was conceived from the outset as a family of products. In addition to meeting its objectives of increased competition among suppliers and enabling innovation, OpenCable also makes possible a viable retail distribution strategy. Equally important to a retail product offering is the ability to offer not only hardware that is portable between different cable systems, but also services that are portable. To this end, the next phase of OpenCable has begun to tackle specifying a common software environment to which applications and interactive services can be written. This environment will extend the flexibility of the OpenCable design to enable innovation in the realm of interactive services and applications, just as it has done in the hardware space.