

## INVENTION DISCLOSURE

### 1. Invention Title.

**A method/architecture for enabling 2-way cable services to home networked IP-STBs with OCAP, but w/o cable modem and tuner**

### 2. Invention Summary.

This invention describes a method/architecture for extending traditional 2-way cable services to OCAP-enabled IP-STBs (w/o cable modem and tuner) via a 2-way gateway device.

### 3. Invention Description.

- a. **Describe the invention in detail and/or attach a description, drawing(s) and/or diagram(s), if available. Please include flow charts for descriptions of software processes, and block diagrams for descriptions of hardware systems. Include the description/attachments in electronic form if possible.**

The following diagram outlines the architecture for enabling 2-way services to IP-STBs in the home.

The 2-way gateway device implements all the functionality of the OpenCable 2.0 Host and the following additional functionality: DHCP Server, NAT/NAPT and DSG HN Client/App Proxy. However, the implementation of OCAP stack and Multimedia Processor functionality is optional.

**DSG HN Client/App Proxy:** This entity acts as a proxy between DSG clients resident on IP-STBs and the DSG Client Controller in the gateway, and delivers the DSG Tunnel contents to the IP-STB.

#### **Application Tunnels**

The applications running on IP-STBs provide their "Application Names" to DSG HN Client/App Proxy using a service (could be a UPnP Service) exposed by it on the home network. The DSG HN Client Proxy obtains the corresponding App Ids from the Source Name Subtable, requests the Application Tunnels from the DSG Client Controller and communicates the App Ids to back to the IP-STB. DSG HN Client/Apps proxy uses this Application Id as a tag when communicating all the data belonging to this app to the IP-STB. If there are no application tunnels available for that app, the DSG HN Client/App Proxy informs the IP-STB that there are no tunnels available. If application tunnels are available for any app on the IP-STB, the DSG HN Client/App Proxy establishes a secured TCP/UDP unicast connection between itself and the IP-STB for communicating application tunnel information to that client.

The DSG Client Controller establishes appropriate filters in the eCM so that the eCM forwards appropriate tunnels for applications on the home networked IP-STBs.

eCM forwards application tunnels to Host 2.0 stack and also to the DSG HN Client/App Proxy. The DSG HN Client/App Proxy communicates payload information in the application tunnels to appropriate IP-STB over the secured unicast connection. DSG HN Client/App Proxy tags application data with corresponding App id so that the IP-STB can parse the data appropriately and deliver it appropriate application.

### **Broadcast/Multicast Tunnels**

Broadcast and Multicast Tunnels that contain SI information are forwarded by the eCM to the DSG Client Controller (in the Basic DSG Mode) or to Host 2.0 directly (in advanced DSG Mode) [CCIF]. When DSG Tunnels are directly communicated to the Host 2.0 directly, the DSG HN Client/App Proxy communicates the information carried in these tunnels to the IP-STBs on the home network using already established secured unicast connection. The DSG HN Client/App Proxy tags this information with application id of 0.

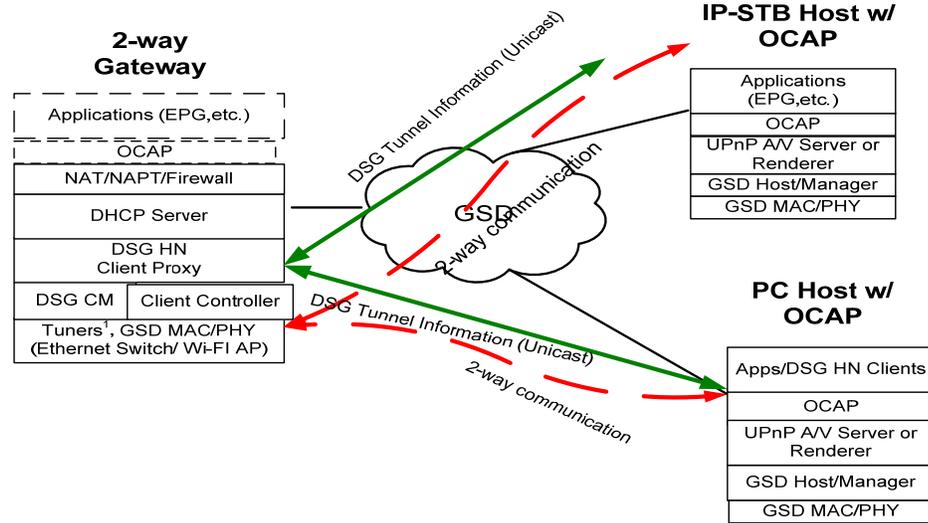
If the broadcast and multicast tunnels are first forwarded by the eCM to the DSG Client Controller, the DSG Client Controller communicates information contained in these tunnels to the Host 2.0 as specified in the [CCIF]. In this case, the DSG HN Client/App Proxy takes this information, encapsulates it in IP packets and sends it to all the IP-STBs on the home network using already established secured unicast connection.

### **Two-Way communication:**

The DHCP Server functionality in the 2-way gateway supplies DHCP IP addresses in the private IP address space to IP-STBs in the home. NAT/NAPT functionality provides address and port translation when IP-STBs are communicating with application servers, in MSO private IP space, for their 2-way communication. The IP-STBs perform their 2-way communication over secured unicast connection. 2-way gateway authenticates an IP-STB before establishing secure TCP unicast connection with an IP-STB.

Additionally, the IP-STB can communicate to other HN devices directly, without utilizing the secure unicast connection to the gateway.

## 2-way architecture for IP-based home networked clients



1. How to resolve contention about resources associated with competing MSO apps
2. Do we need modifications in the message structure between CC and a host to support multiple Hosts
3. Can we configure static routes in the Hosts...In general we need to resolve the routing issues

Figure 1

- b. **Why was the invention developed? What problem(s) does the invention solve? How is it better?**

There is not published mechanism for enabling 2-way services to home networked IP-STBs w/o CM and tuner.

- c. **Briefly outline the potential commercial value and customers of the invention.**

This solution enables low cost IP STBs in the home that result into cost-effective means of providing 2- way cable services to multiple devices in the home.

4. **How is your invention different from existing products, processes, systems? Please list the closest publication(s), product(s), method(s), patent(s), etc. to your invention. For each item, how is your invention different?**

Not aware of existing solutions.