

## INVENTION DISCLOSURE

### 1. Invention Title.

#### **Cascading DOCSIS Service Flows via Dynamic Service Flow/Tunnel Creation**

### 2. Invention Summary.

This invention provides a mechanism for faster upstream DOCSIS data rates via the dynamic creation of data tunnels and matching service flows within a single CM.

### 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 concept behind cascading service flows is that a modem could be provisioned and/or software enabled to dynamically create and use multiple service flows. With each service flow having a functional limit of 250 packets per second (pps) or 3Mbps, when data entered the CMCI interface which required less than or equal to 3 Mbps, a single service flow would be created. The data for this first service flow would be encapsulated using a tunneling method which would meet the criteria specified during the dynamic creation of the first service flow. If the data rate needs were to then increase to more than 3 Mbps, a second service flow could be created, a second tunnel would be created, and the single CM would now be capable of 500 pps or 6 Mbps. This process of demand based dynamic service flow and tunnel creation could be applied to DOCSIS 2.0 and DOCSIS 3.0 with the maximum number of service flows allowed by each modem being scaled appropriately according to modulation, channel width, and number of upstream channels.

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

This enables a single modem to use more upstream resources when available than the current request/grant system. In addition, this enables ANY type of traffic to be split into multiple service flows to increase the available usable bandwidth.

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

The potential customers include CM manufacturers (Motorola, Arris, Cisco, etc.) and other DOCSIS device manufacturers.

### 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?**

Currently there are few applications that utilize multiple service flows in a single CM. Most cases are currently used for predictable services in which the traffic profile is consistent and predictable i.e. VOIP, PacketCable Multi-Media, etc. At present the ability to apply a service flow definition to general and unpredictable traffic i.e., variable packet size, variable inter-packet spacing, limits the ability of the modem to fully utilize it's ability to use multiple service flows. The unique claims herein stem from the dynamic creation of BOTH the service flow AND the tunneling encapsulation parameters, thus allowing ANY type of traffic to be redirected into specific service flows.