

# INVENTION DISCLOSURE

## 1. Invention Title.

### **Scalable CPE Connection Request Proxy Mechanism**

## 2. Invention Summary.

Proxy function in a TR-069 capable gateway to perform Connection Request on behalf of the ACS to reduce connectivity and state of TR-069 CPEs behind the gateway

## 3. Invention Description.

### **a. Describe the invention in detail.**

In a TR-069 Environment CPEs behind a gateway are seen as gateway peers. In other words, the ACS maintains state of all CPE, either as open connections or via pinholes in the residential gateway NAT/firewall. This Invention proposes a method to pass the connection request from the ACS to the in-home CPES through the TR-069 Gateway without the need of STUN or any other presence/firewall-state mechanism.

*The requirements of this proposal are:*

- To define a TR-069 data element that when the ACS set the element in the Gateway, the latter executes a Connection Request to the CPE.
- The request is stateless in the gateway. It consists of a set parameter in the Host.Hosts instance of the CPE of interest.
- Upon reception of the Connection request by the CPE, the rest of the communication flow use the standard TR-069 mechanisms where the CPE initiates the connection to the ACS.

Preconditions:

- CPE and Gateway are TR-069 capable
- The ACS already has logically associated the CPE with the Gateway (TR-069 Annex F)
- The CPE has already announce itself to the ACS at boot /periodic/schedule inform
- The ACS identifies the CPE in the Host.Hosts object

Use case:

The operator rarely contacts the CPE for status or configuration audits/updates. CPEs outperform the number of Gateways, thus, minimal state is optimal, meaning, CPES are connected to the ACS “as needed”. In regular circumstances such state is in the form of bindings to maintain open connections though NAT and Firewalls for each CPE.

The ACS only updates the association of the CPEs with the gateways in a data repository any time the CPE updates the ACS (normally at boot time).

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

Such mechanism or similar does not exist in TR-069 and reduces cost on certain scenarios where CPEs are 10 folds the number of gateways.

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

TR-069 is under Broadband Forum members IPR. This is a protection mechanism rather than a revenue generating patent that could be part of the TR-069 standard.

- 4. HOW is your invention different from existing products, processes, systems?**

TR-069 itself defines mechanisms to bypass NAT/Firewalls that requires state between the CPE and the ACS, or potentially other Presence mechanisms. This proposal removes state by relying on information already available at the gateway.

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