CLAIMS

1. A line card for rate limiting control packets in a network element, comprising:

a packet parsing engine to parse control packets to determine protocol types of the control packets and extract a set of one or more identifier keys in each control packet based on the determined protocol type of the control packets;

a plurality of first execution units each to each perform a first level of control packet rate limiting on the control packets per unique ones of the set of identifier keys and protocol type according to a number of control packets of each unique protocol type and set of identifier keys that are accepted for processing over a first time interval, wherein each of the first execution units is to drop those control packets that fail the first level of control packet rate limiting; ~~and~~

a set of one or more second execution units to perform a second level of control packet rate limiting on those control packets that pass the first level of control packet rate limiting per protocol type according to a number of control packets of each unique protocol type that are accepted for processing over a second time interval, wherein each of the set of second execution units is to drop those control packets that fail the second level of control packet rate limiting; and

said line card being configured to send those control packets that pass the second level of control packet rate limiting to a control card of said network element for being processed by the control card.

2. The line card of claim 1, further comprising:

a memory to store rate limit values and packet count values, wherein the rate limit values include identifier key rate limit values and protocol level rate limit values, wherein the packet count values include the following:

for each unique set of identifier keys per protocol type, a packet count value that indicates the number of packets accepted for processing over the first interval associated having that set of identifier keys and protocol type, and

for each protocol type, a packet count value that indicates the number of packets accepted for processing having that protocol type.

3. The line card of claim 1, wherein each of the set of second execution units further is to send those control packets that pass the second level of control packet rate limiting to a control card coupled with the line card.

4. The line card of claim 1, wherein the plurality of execution units is to perform the first level of control packet rate limiting for those packets which are PADR (PPPoE Active Discovery Request) packets and PADI (PPPoE Active Discovery Initiate) packets separately, wherein the set of identifier keys used in the first level of control packet rate limiting for PADR packets and PADI packets includes one or more of a source MAC address, a VLAN (Virtual Local Area Network) identifier, and a port identifier.

5. The line card of claim 1, wherein the control packets include DHCP (Dynamic Host Configuration Protocol) control packets, and wherein the set of identifier keys used for each of the DHCP control packets includes one or more of a source MAC address included in that DCHP control packet, a source IP (Internet Protocol) address in that DHCP control packet, a VLAN (Virtual Local Area Network) identifier in that DHCP control packet, an ATM (Asynchronous Transfer Mode) PVC (Permanent Virtual Circuit) identifier in that DHCP control packet, a GIADDR (Gateway IP Address) in that DHCP control packet, and a port identifier on which the DHCP control packet is received on.