1. **Invention Title.**

Method for supporting multi-ISP

2. **Invention Summary.**

This invention provides a mechanism for supporting home networks with more than one ISP (e.g. for a home office).

3. **Invention Description**.

a. Describe the invention in detail.

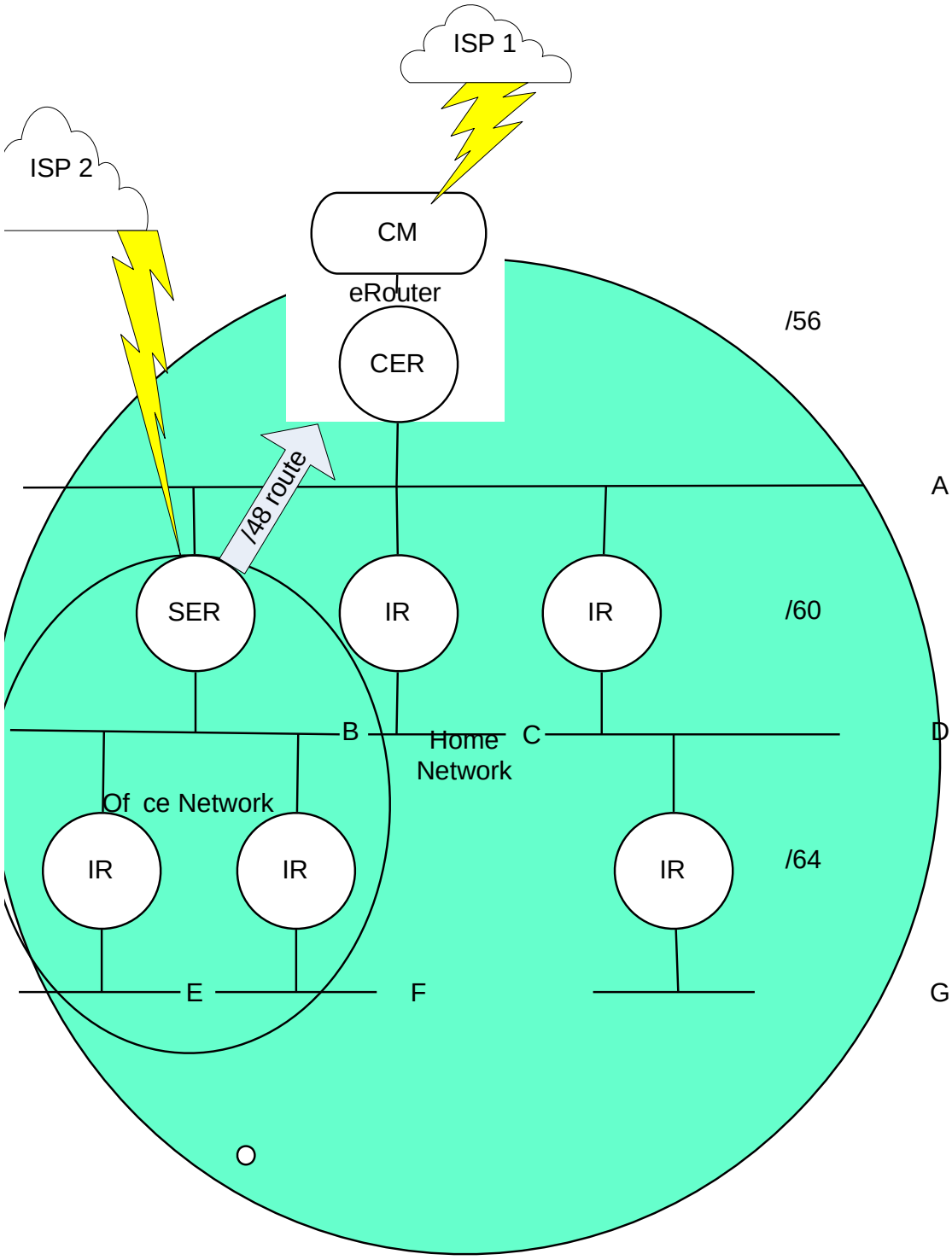
CableLabs has previously developed a hierarchical home network architecture using DHCPv6 Prefix Delegation and Router Advertisements to automatically configure the home network. This idea is an extension on the earlier architecture.

When a customer has two ISP connections (one primary connected to the Customer Edge Router (CER), and one secondary connected to the Subordinate Edge Router (SER)), the CER obtains Prefix 1 from ISP 1 and the SER obtains prefix 2 from ISP 2. The routers then build a hierarchical tree per our earlier algorithm. If the SER is subordinate to the CER in the hierarchy, it obtains a prefix from the CER or an intermediary IR (this prefix is a subnet of Prefix 1 – Prefix 1A) and distributes both Prefix 2 and Prefix 1A to subordinate IRs. It then does a binary comparison of Prefix 2 and Prefix 1A, and identifies the number of common bits (for example, 47). It then installs a default route to the CER (or intermediate IR) and a route to ISP2 based on the binary comparison (common bits+1, 48 in the example).

If the CER and SER are plugged in to the same LAN segment, the CER and SER both send RAs for their respective prefixes. Based on the RAs, both the CER and SER obtain prefixes from each other. The CER receives Prefix 2A and the SER receives Prefix 1A. The router identified as CER per CableLabs' Up-detection algorithm distributes Prefix 1 and Prefix 2A to subordinate routers. Based on the binary comparison described above, the CER installs a default route to ISP 1 and a more specific route (e.g. /48 per the example) to the SER. The SER installs a default route to the CER and more specific route (e.g. /48) to ISP2.

This allows default traffic to flow to the CER, but corporate VPN traffic (or other ISP2-specific traffic) to flow to ISP2.

This invention is also useful when a routing protocol (e.g. zero-configuration OSPF) is used in the home. The routers in the home will see two external prefixes in the routing protocol updates. Each router then makes a binary comparison of both prefixes and installs routes pointing to the edge routers based on the number of common bits+1.



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

Traditionally, multihoming was enabled using BGP or NAT. The homenet working group within the IETF is defining another solution using zero-configuration OSPF and source routing. Our solution does not require a routing protocol, NAT, or source routing. In the event where OSPF is used (e.g. the homenet solution), our approach does not require source routing, and solves a significant problem the working group is considering.