



EzIP Enhanced Internet

Presentation to

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Outline

- A. Why this Proposal**
- B. What is the Solution**
- C. Optimum Approach**
- D. Technical Considerations**
- E. Enhanced Internet Architecture**
- F. Summary**



A. Why this proposal

- **IPv4 address pool almost depleted**
- **IPv6 deployment sluggish**
 - https://stats.ams-ix.net/sflow/ether_type.html
 - <https://stats.labs.apnic.net/ipv6>
- **ISPs in developed regions showing no interest in end-to-end connectivity**
- **Disadvantaged regions concerned with**
 - **technical challenge, and**
 - **financial burden of going to IPv6**
- **IPv4 and IPv6 coexist on Dual-Stack for quite sometime to come**



Boundary Conditions

- **Demand - By Year 2020:**
 - **Population: 7.6B (Billion)** - World Statistics
 - **IoT Devices: 50B** - Average 6.6 IoTs / Person (Assumption)
https://www.cisco.com/c/dam/en_us/about/ac79/docs/innov/IoT_IBSG_0411FINAL.pdf

- **Supply - IPv4 Address Pool Size: About 4B (from 256 x 256 x 256 x256, or 4 Octets with 8 Bits each)**

- **Address Demand estimated to be 13 times over the Supply**

- **Actual usable IPv4 pool much smaller than 4B due to historical allocation practices**
<http://www.iana.org/assignments/ipv4-address-space/ipv4-address-space.xhtml>



B. What is the solution

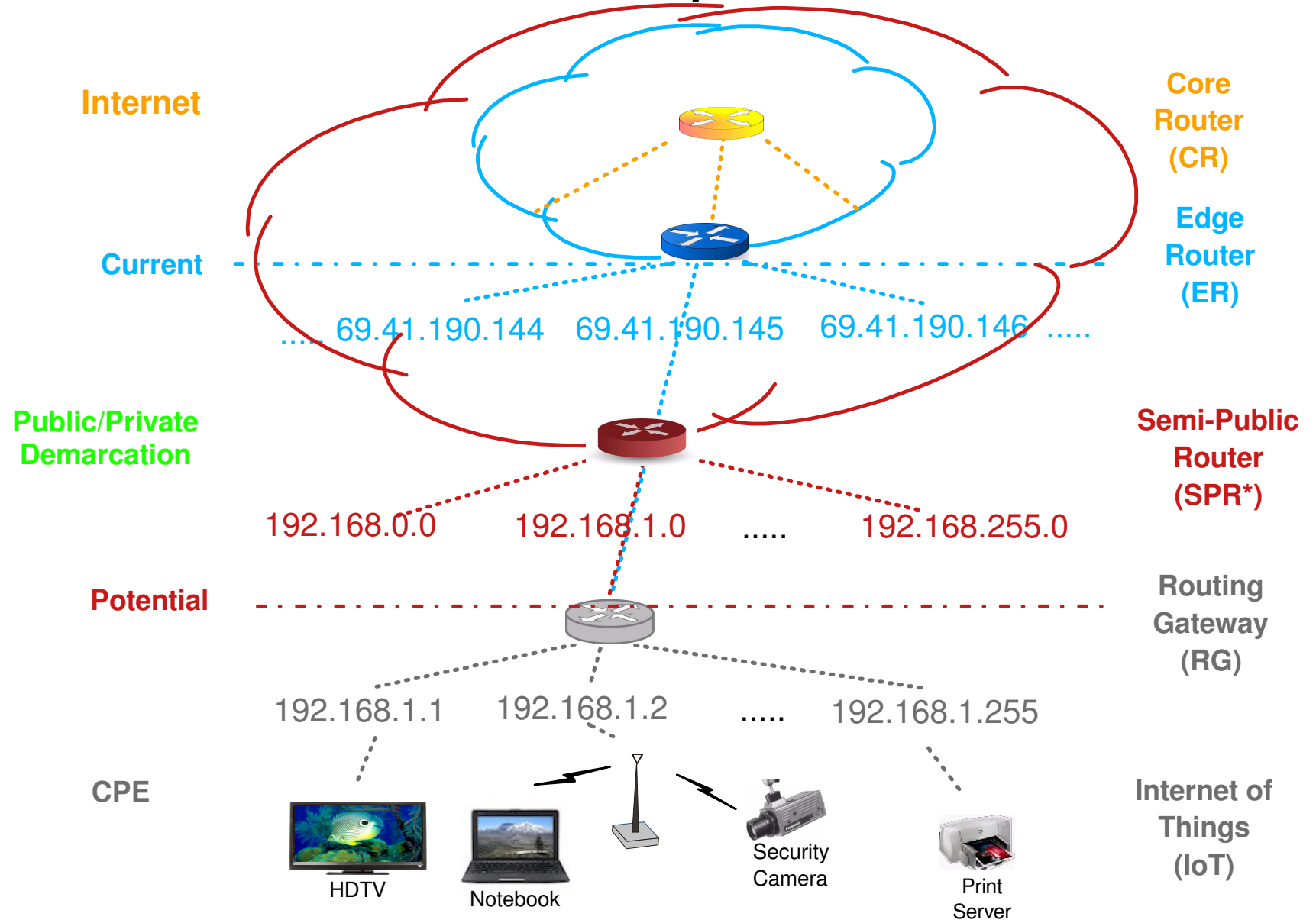
- **Expand assignable IPv4 public address pool:**
 - **Introduce Semi-Public Router (SPR) - A simple IPv4 compatible new router**
 - **Insert an SPR inline, between an Internet Edge Router (ER) and the private premises it serves, to expand the assignable public addresses**
 - **Designate a block of addresses within the IPv4 pool for SPR to use**

(Refer to example - next slide)



Common Practice

Semi-Public Router Example -- 192.168.K/24



* SPR - US Patent Pending



C. Optimum Approach

■ **The 240/4 netblock:**

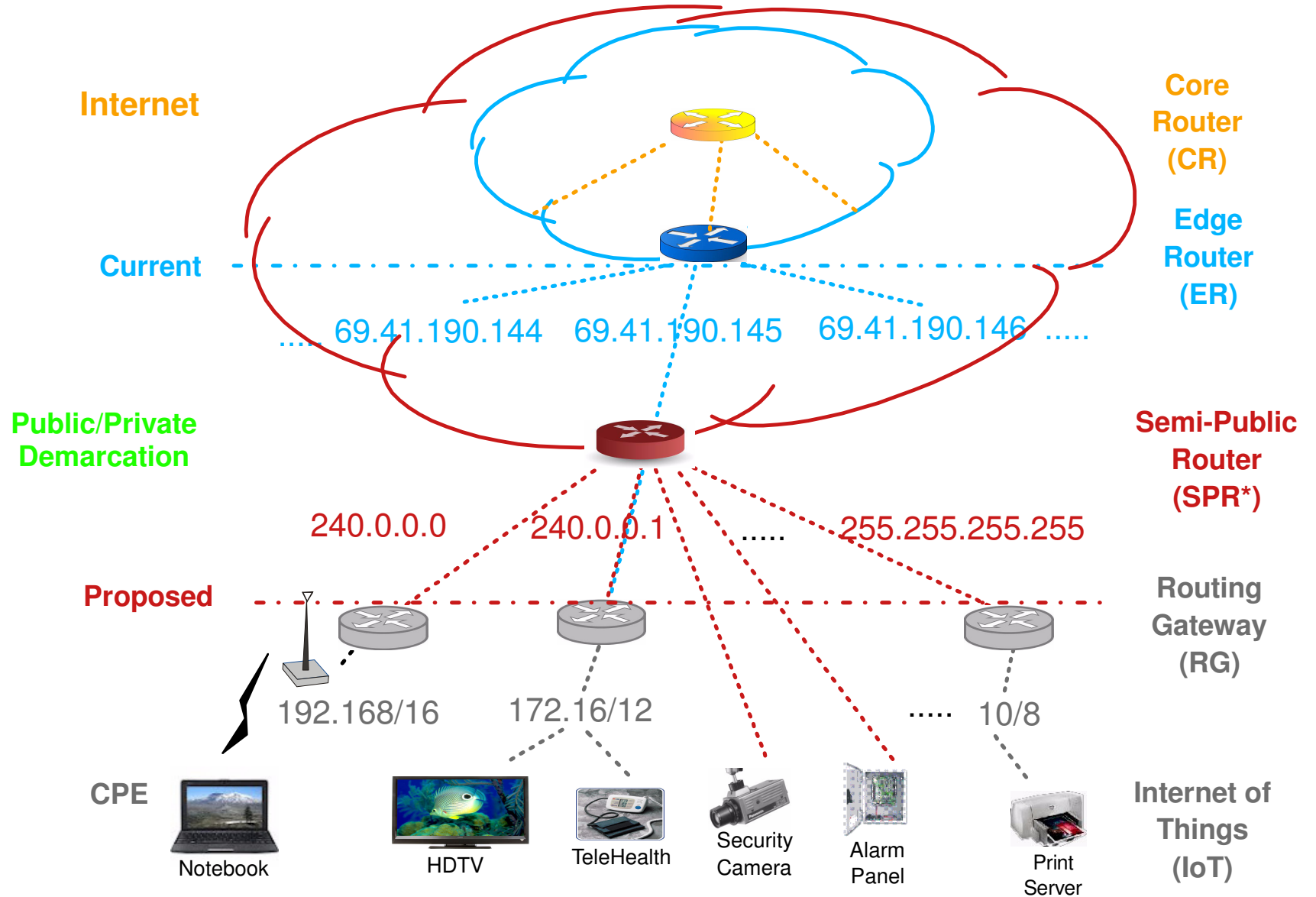
- **From 240.0.0.0 through 255.255.255.255 whose first four bits are all "1", totaling 256M addresses**
- **Reserved for "Future use" since 1981-09: Not routable - neither publicly nor privately**
- **Offers the potential of multiplying each current IPv4 public address by 256M times, yet**
- **Does not impact existing public and private networks, nor IoTs**

(Refer to Optimum EzIP example - next slide)



Optimum EzIP

-- 240/4 (240.0.0.0 - 255.255.255.255)



* SPR - US Patent Pending



D. Technical Considerations

- **APNIC: Requested to redesignate 240/4 netblock for "Private Use"**
(Note: Section 2. Caveats of Use)

<https://tools.ietf.org/html/draft-wilson-class-e-02>

- **RFC 791: Defined Option mechanism in the IP Header (Figure 9)**

<https://tools.ietf.org/html/rfc791>

- **Over a dozen of Option numbers available**

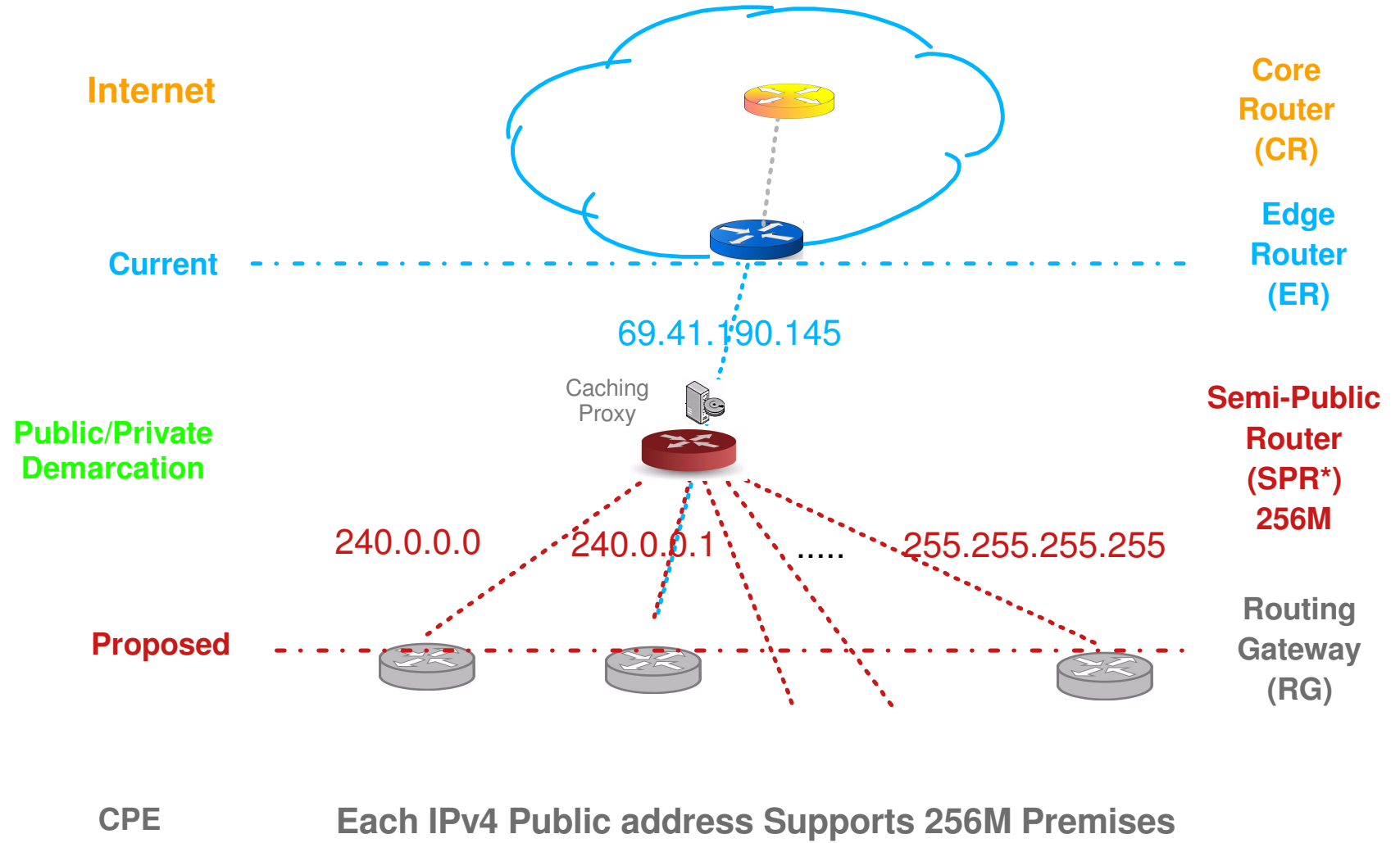
<http://www.iana.org/assignments/ip-parameters/ip-parameters.xhtml>

<https://tools.ietf.org/html/rfc6814>

(Refer to Enhanced Internet Architecture example - next slide)



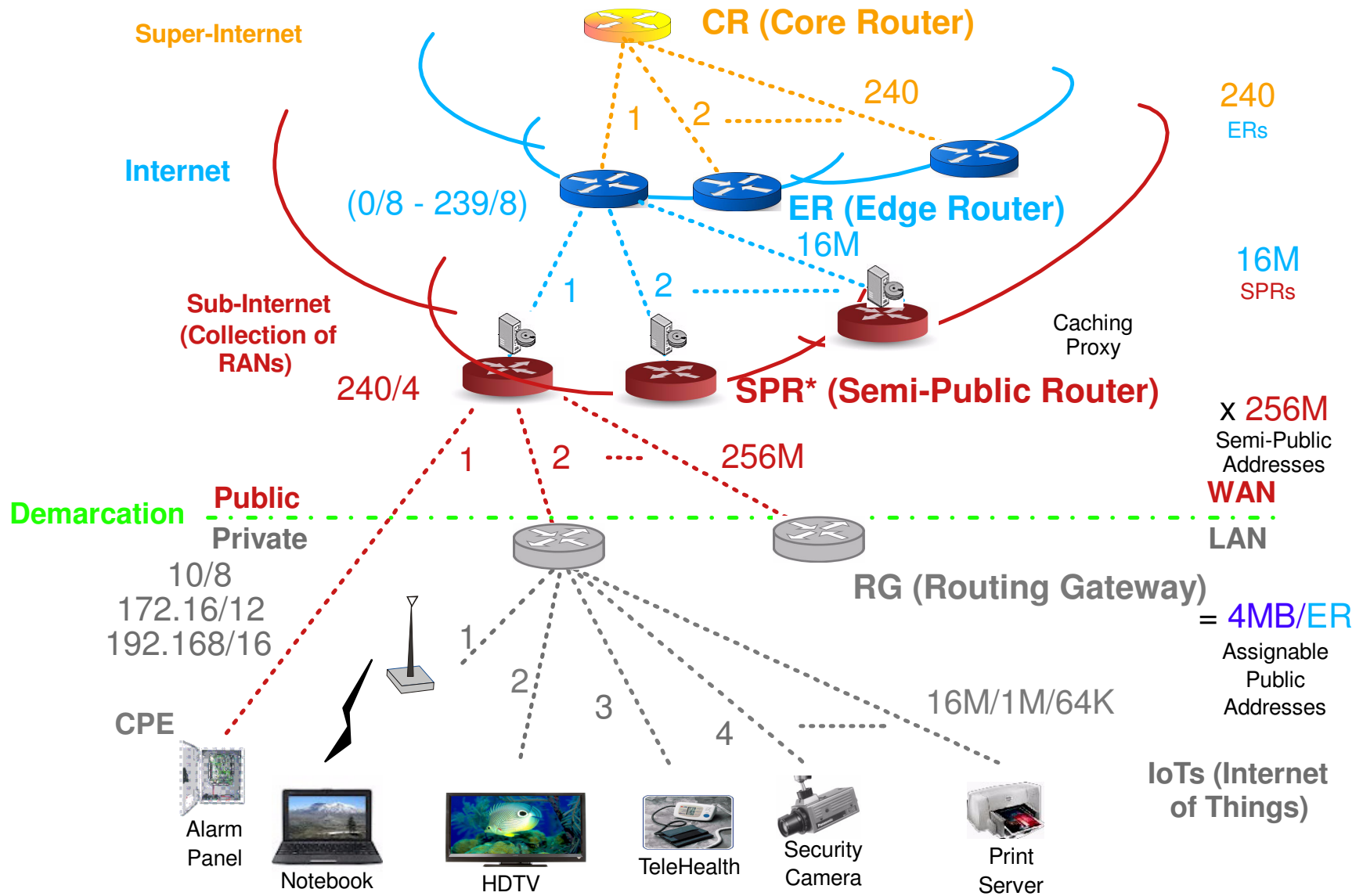
Regional Area Network (*RAN*)



* SPR - US Patent Pending



E. Enhanced Internet Architecture



* SPR - US Patent Pending



F. Summary

- **Address Expansion**
Multiply each IPv4 address by 256M fold

- **Deployment Configuration**
Sub-Internet consisting of Autonomous RANs

- **Operation Discipline**
Inherent GeoLocation Property

- **Enhanced Architecture**
CR with ERs as Super-Internet Backbone

- **Growth Ready**
239 new worldwide Internet-sized networks