Extending IPv4 Address Pool

Overview

2015 March

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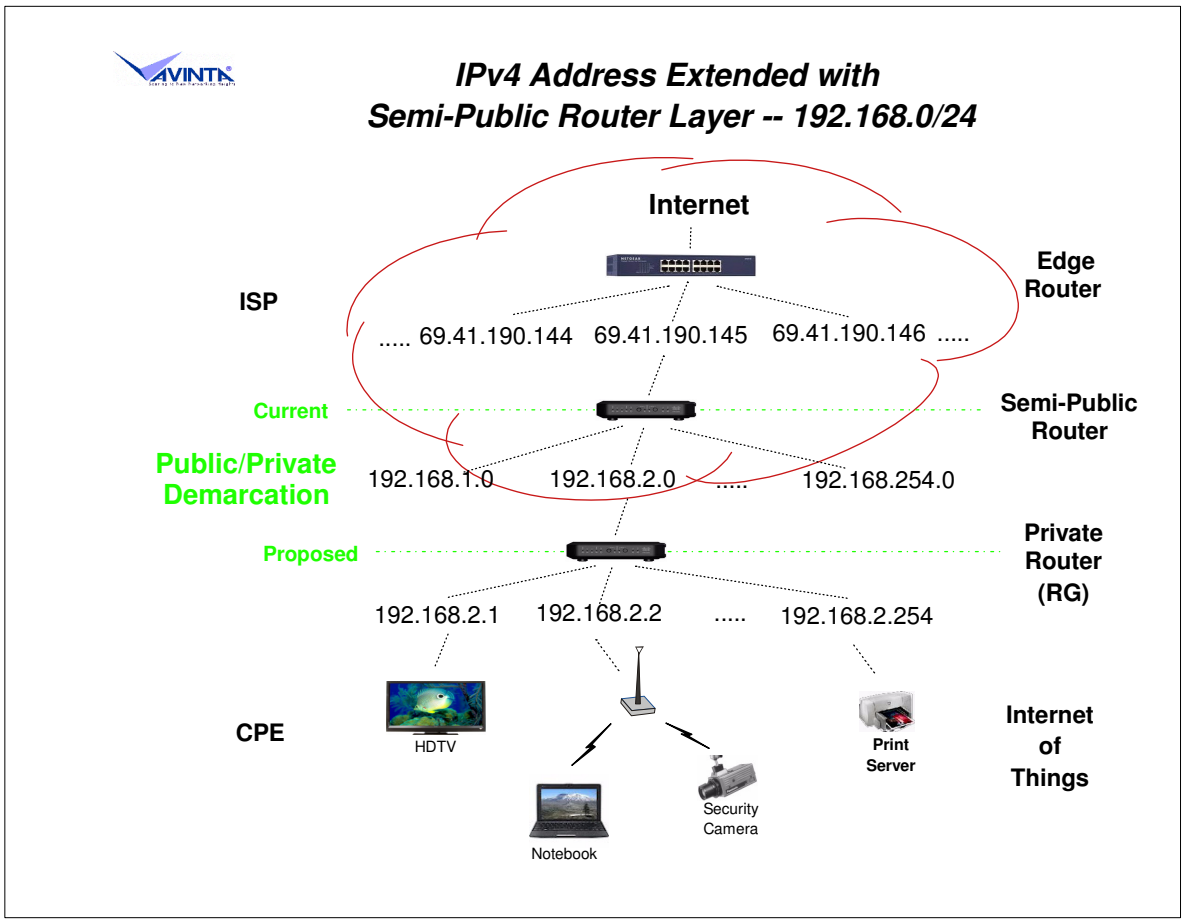
- The original IPv4 Public pool has 4.096B (Binary format for 256 x 256 x 256 x 256) combinations.
- The reserved Private network 192.168/16 block has 64K (256 x 256) combinations.
- Combined, there could be 262,140B (4.096B x 64K) unique addresses for identifying hosts, or IoTs (Internet of Things) that may be connected to the Internet.
- By reclaiming the third octet of the 192.168/16 block or making 192.168.nnn/24 routable from Public network (Internet) point of view, the assignable IPv4 Public pool could be multiplied by 256 times to become 1,048.576B addresses. This is 137 times more than the expected Year 2020 world population (7.6 Billion).
- Following the format (increasing Internet Header Length to reflect the added fields) recommended by W. Chimiak ("IPv4 with 64 bit Address Space" - https://tools.ietf.org/html/draft-chimiak-enhanced-ipv4-00), the "nnn" may be transported by an optional entry in the Internet IP Header. Instead of 32-bits for each of the Enhanced Source & Destination addresses, however, only 8 bits each would be needed for the incident Extended IPv4 case. Thus, one fewer 32 bit word will be needed. This even includes 16 bits spare for future larger Extension cases, such as making use of the Private Business network 10/8 or 172.16/12 block, with the capacity of 16M and 1M addresses, respectively,
- The remaining fourth octet of 192.168.nnn.0/32 offers 256 addresses for each individual to assign to personal IoTs.



- The Semi-Public Router is a basic router that routes an IPv4 Public address to 256 client subscribers.
- Since the physical connection hardware to respective subscribers already exists, and the Semi-Public Router provides just one extra stage of simple routing, it could be absorbed, through software enhancement, into the existing Edge Router.
- Each residential premises is identified by the third octet "nnn" of the 192.168.nnn/24 under a regular IPv4 Public address. Only "nnn" needs be appended to the Public IPv4 address to uniquely identify an entity.
- In the diagram shown, e.g., the customer premises populated with wireless IoTs may use "69.41.190.145 - 2" notation to identify itself to other parties in the Internet.
- Existing RG Router with NAT remains in place, except its duty is reduced to handle only the 4th octet of 192.168.nnn.0/32. By incorporating enhanced DMZ capability, inbound traffic may be routed to a desired host to get a session started.
- Overall, the implementation of ExIP (Extended IPv4 Address Pool) consists of only software enhancements. There will not be any need for new, or upgrading hardware.