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Sub-Internet Overview

Researching the Internet IPv4 address exhaustion issues, Avinta Communications, Inc. developed a patent-pending technique named EzIP* (phonetic for Easy IPv4) to expand the assignable public address pool significantly using the long-reserved 240/4 netblock. Transported by the original IPv4 protocol Option Word mechanism, remote access of these extended addresses can be achieved among EzIP-capable IoTs (Internet of Things) served by a new class of routers named SPR (Semi-Public Router).

Although the initial motivation for the EzIP was to extend the assignable address, each SPR can now serve a vast population (up to the largest city – Tokyo Metro, or most of the countries worldwide except the largest top 25%). This makes possible a new self-contained communications environment, called Sub-Internet, for providing improved Internet services. This configuration leads to a simplified SPR that is essentially the same common IPv4 router except using the 240/4 netblock. One important characteristics of this degenerated SPR is that it is not restricted by most of current Internet conventions. This is because the former is still regarded by the latter as part of a private network, as long as there is no cross-connect facility between the two. The Sub-Internet offers the benefits of enabling systematic IP address management, sustaining current EzIP-unaware IoTs, while mitigating the root cause to cyber security vulnerability, etc.

A Sub-Internet consists of two main subsystems:

A. Regional Area Network (RAN): This is made of a degenerated SPR for transporting Intra-RAN traffic among all (EzIP-unaware or EzIP-capable) IoTs. Existing router designs can be easily adapted to provide this function, unless they were specifically hard-programmed to reject packets with addresses from the 240/4 netblock.

B. RAN Gateway: Instead of the NAT (Network Address Translation) function provided by a common RG (Routing / Residential Gateway), a Sub-Internet utilizes the store-&-forward technology to provide address translation as well as activity buffering for packets that need to go beyond a local RAN. These functions can be fulfilled by Caching Proxies that are already being used in private networks for large institutions and distributed servers for major web based businesses.

* https://tools.ietf.org/html/draft-chen-ati-adaptive-ipv4-address-space-04