

WAN-LAN Auto-discovery on a Router

This disclosure proposes methods to identify the WAN port vs LAN ports on a router which can dynamically configure any port to be a LAN Port or the WAN port.

Problem Statement :

As the number of router devices increase in the home and as these routers get connected in various configurations, some customers are misconfiguring the WAN (Wide Area Network) and LAN (Local Area Network) ports. A mechanism to autoconfigure router ports may be desirable. This allows the user complete freedom to connect the wiring between the Routers, allows plug-and-play of these devices, instead of carefully configuring and connecting each one.

Solution :

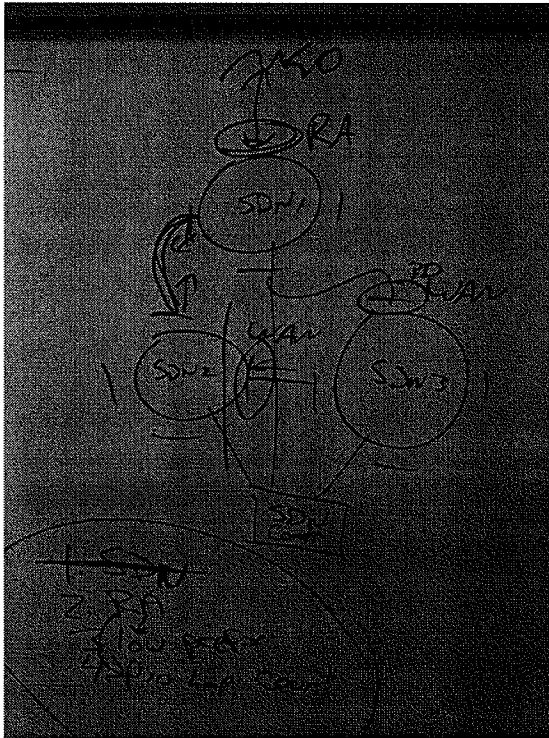
Because home routers will only send a Router Advertisement (RA) on LAN interfaces after they receive an address on the WAN interface, we can use RA detection as a mechanism for router orientation detection. Each router device in the network looks for RAs on all of its interfaces. The first interface on which the router receives an RA is chosen by that router as its WAN interface. All other interfaces become its LAN interfaces.

Once the router obtains a Prefix from its WAN interface, it will start sending Router Advertisements down all of its LAN interfaces. Any downstream routers will see these RAs and configure their own WAN ports accordingly. This way, every router in the network can figure out which of its ports are LAN-side and which are WAN-side ports.

In case a router sees multiple RAs at a time, it can use the following rules as a tie-breaker.

- 1) The Router Prefix Information option (PIO) in the RA conveys the prefix of the network. Here the tiebreaker proposed is that the router chooses the lowest numbered network and configures that interface as the WAN port. The other RA is discarded and all the other ports become LAN ports.

- 2) A second tiebreaker could be the hop count as advertised in the PIO [Reference to IETF Draft-Howard-UP-PIO]. The edge router starts with a hop count of 0. As each router advertises its prefix downstream in an RA message, it increments the hop count of the PIO. This way, a downstream router can figure out which of the RAs to choose, based on the shortest hop count to the Customer Edge Router in the Home.



Every home router manufacturer will benefit from this disclosure, allowing for automatic configuration and simple connection in the home network. MSOs will have to deal with fewer customer calls about broken connectivity due to customer mis-configuration.