Multiple Interfaces (MIF) Problem Statement

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Related Drafts to PS

- draft-blanchet-mif-problem-statement-00.txt
  - Used as the framework for this presentation
- draft-yang-mif-req-00.txt
- draft-hong-mif-analysis-scenario-00.txt

- draft-hui-ip-multiple-connections-ps
- draft-savolainen-6man-fqdn-based-if-selection

Context

- A host (phone, laptop, server, ...) has multiple network interfaces (physical and/or virtual), such as:

    - wired Ethernet LAN, a 802.11 LAN, a 3G cell network, one or multiple VPN connections

    - and/or one or multiple automatic or manual tunnels.

- Receives configuration information from *each* of its access networks, through: DHCPv4, DHCPv6, PPP, IPv6 RA, ...

Assumptions

- Host:
  - Has already discovered/selected/authenticated into its access networks
  - interfaces are enabled for IP traffic
  - Is not a router
  - Is not necessarily running mobileIP code
  - May or may not be mobile

Interface-scoped vs node-scoped

- Received configuration objects are:
    - interface-scoped, such as:
        - IP address, link prefix.
    - node-scoped, such as:
        - routing information (default gateway)
        - DNS servers IP addresses
        - address selection policies
        - NTP-server IP adresses, ...

Symptom of the Problem

- Insufficient or conflicting configuration results in traffic going out the wrong interface. Wrong may mean that a particular service is not available via that interface, or that even if it is, the path chosen is not desirable for reasons such as security concerns, cost, etc."

- Next slides detail some issues

DNS

- Each interface configuration object has different DNS servers IP addresses

- On some interfaces, DNS serves private names

  - VPN to corp network

  - Subscriber-only services

- Private names resolution is only available on specific interfaces.

- If node-scoped DNS server addresses are:

  - Not the right ones to resolve the private names

  - Or is reachable by another (i.e. wrong) interface

- Then resolution of the private names does not work or resolves to wrong data (same private names)

Interface selection

- Node may have multiple routes to a destination, such as multiple defaults on multiple interfaces. Node/app have no hint to decide which interface to use.

- Node may need to reach another node through a specific interface, while there is no specific route to it through that interface.

- Address space on some interfaces may be colliding.

Interface selection

- There is no standard way for the network to provide information to the node to choose an interface.

Address Selection

- Source addresses on some access networks are not valid (not reachable on the way back, filtered, …).

  - Not only choosing the right interface is a problem, but also which source address to use.

- Networks may need to push specific address selection policies, but the current address selection policy is implemented as node-scoped. Conflicts in address selection policies exists because they depend on the interface.

Today

- Implementations use different techniques to mitigate the stated problem.

  - See draft-mrw-mif-current-practices

  - next presentation

Questions?

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