

Evaluation of IPv6 Auto- Transition Algorithm <draft-palet-v6ops-auto-trans-01>

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Framework and Objectives

- This memo evaluates a method called "auto-transition" to ensure that any device can obtain IPv6 connectivity at any time and whatever network is attached to, even if such network is connected to Internet only with IPv4
 - Or already has IPv6 but with poor performance
- Deal with aspects regarding
 - Evaluation of the possible IPv6 transition mechanisms
 - How to overcome IPv4 network barriers like NAT and Firewalls
 - Definition of an algorithm to choose the best mechanism according to performance criteria

Motivation (I)

- There are well known methods for IPv6 autoconfiguration
 - Stateless and statefull IPv6 autoconfiguration (RFC2461)
- There are also transition mechanism for getting IPv6 connectivity through IPv4 networks
 - Tunnel-based (6to4, TB, ISATAP, Teredo, ...)
 - Most of them aren't automatic
- There is a contradiction:
 - While IPv6 tries to help the users by means of autoconfiguration, it only can be used if native IPv6 connectivity is available.
- Users and appliances require complete PnP, even when only IPv4 is available, so it is required a method that deals with this problem

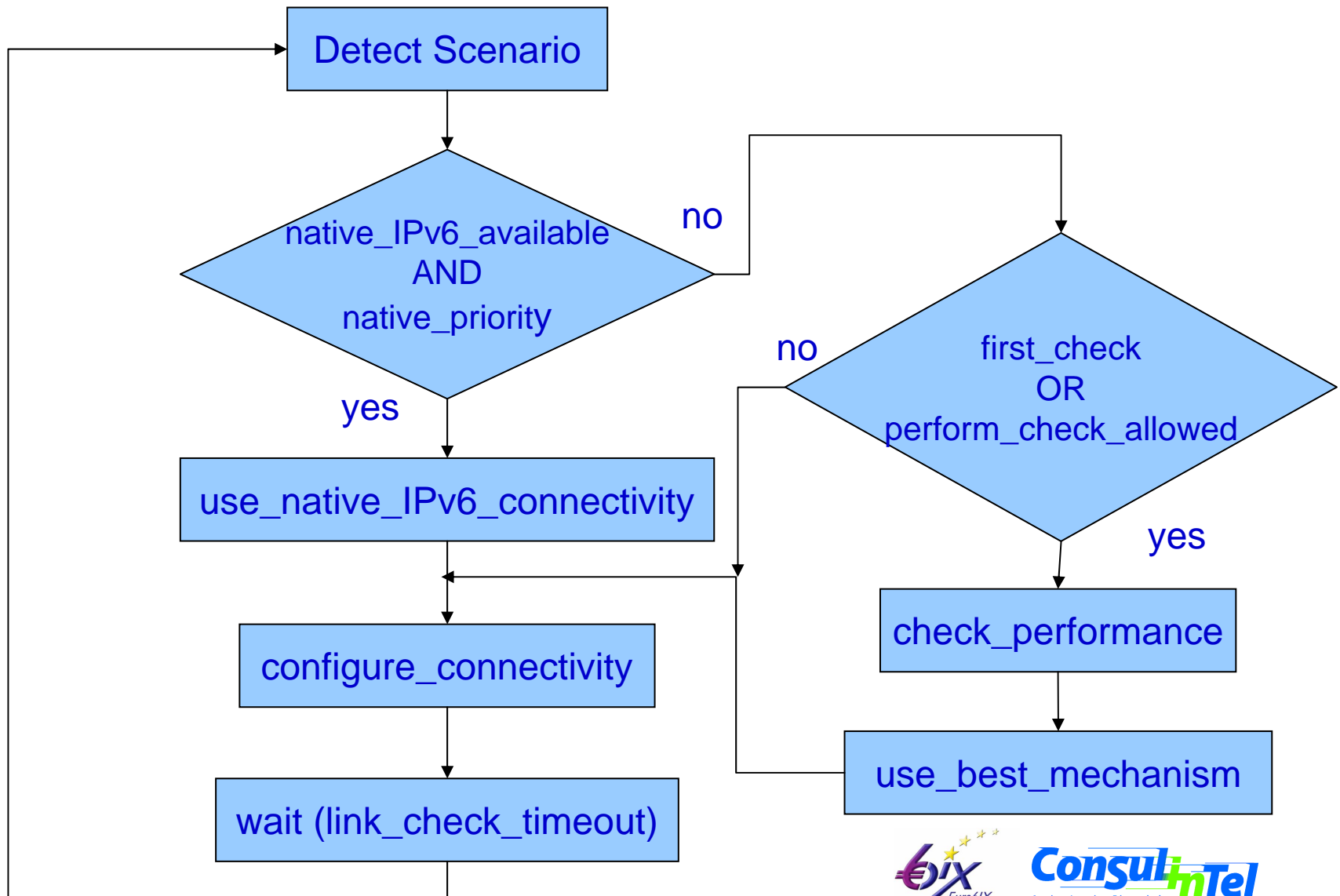
Motivation (II)

- The algorithm is defined to be possibly integrated into the IPv6 stack-set or as a kind of wizard
- Applicable to nodes and middle-boxes (CPEs)
 - Hosts, consumer electronics, appliances, alarms, home-automation devices, ...
- Users don't need to know anything about how to get IPv6 connectivity

Algorithm behavior (I)

- Native IPv6 is preferred, but users could decide to use a transition mechanism if it offers better performance
- The selection criteria is based on connection performance
 - To simplify actual implementation only delay and losses are considered

Algorithm behavior (II)



Modularity Approach

- A possible list of mechanisms to be checked, ordered by preference could be:
 - Native IPv6 Connectivity
 - TS with proto-41
 - TS with UDP
 - ISATAP
 - STEP
 - 6to4
 - Teredo
- But it should be open to others or possibly new mechanisms

Transition Mechanism to overcome IPv4 network barriers

- NAT boxes, proxies or firewalls do not allow tunnel-based transition mechanisms to work properly
- It is required that the auto-transition mechanisms uses a method that cannot be rejected by the middle box. The following solutions could be considered:
 - Layer II tunnels
 - Layer III tunnels
 - Layer IV tunnels

Network Managed Transition

- The process used for getting IPv6 connectivity can be improved by using new functionalities provided by the Network
- The new approach is based on PBNs
- The network stores transition mechanism policies
 - Interaction with other policies is allowed: QoS, Security, Routing, etc.
- The transition mechanism would work better, but it must work even if the network support is not present
- The ISP has control over the transition process

Next steps

- To finalize the I-D as a WG item
- To choose an universal solution to overcome barriers like NAT and/or Firewalls (possibly another document ?)
- Look at the reverse situation (IPv6 is available but IPv4 connectivity required): IPv4 over IPv6 tunneling, in an automatic fashion

Thanks !

Questions ?