

Solution approaches for address-selection problems

draft-arifumi-v6ops-addr-select-sol-00.txt

(NTT PF Lab.) Arifumi Matsumoto

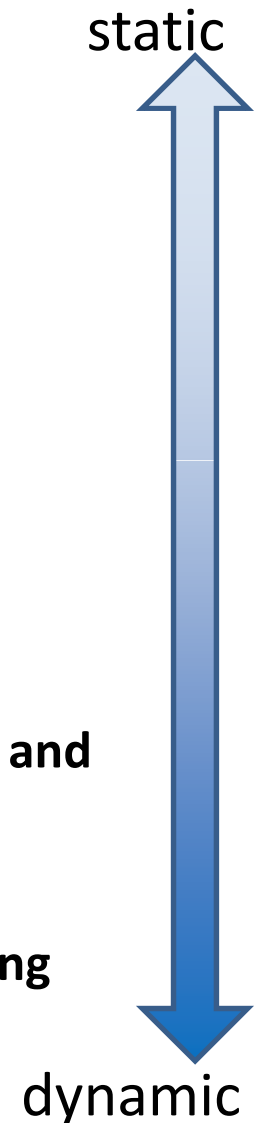
Tomohiro Fujisaki

(Intec NetCore, Inc.) Kenichi Kanayama

Ruri Hiromi

Possible Approaches for Address Selection Problems

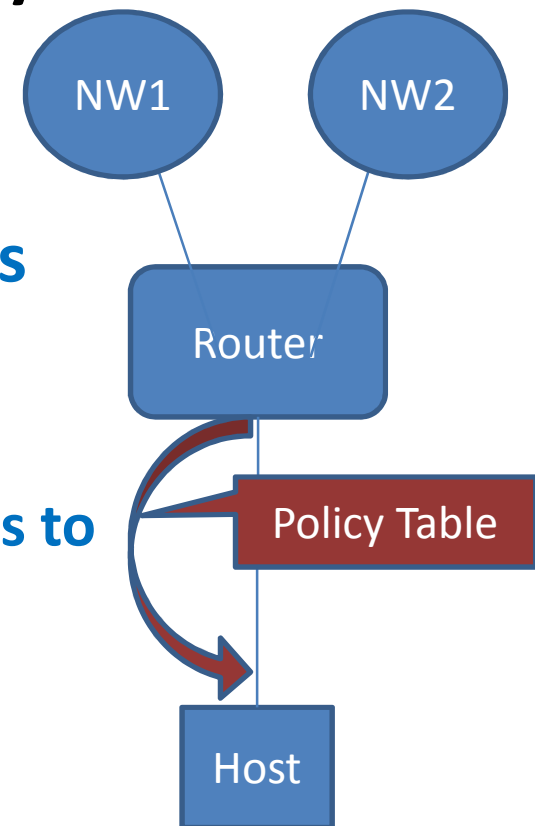
- **Proactive Approach**
 - **Deliver Everything At Once Approach**
 - E.g. A host acquires RFC 3484 Policy Table
 - **A Question and An Answer Approach**
 - A host asks an Agent Server(e.g. a router) “which of my addresses is the best for a destination ?”
- **Reactive Approach**
 - **Try-and-Error Approach**
 - An ICMP Error notifies the host of address false-selection and the host stores cache in case for the next try.
 - **All by Oneself Approach**
 - Shim6: A host performs failure detection and address cycling



The Most Proactive Approach

“Deliver Everything At Once Approach”

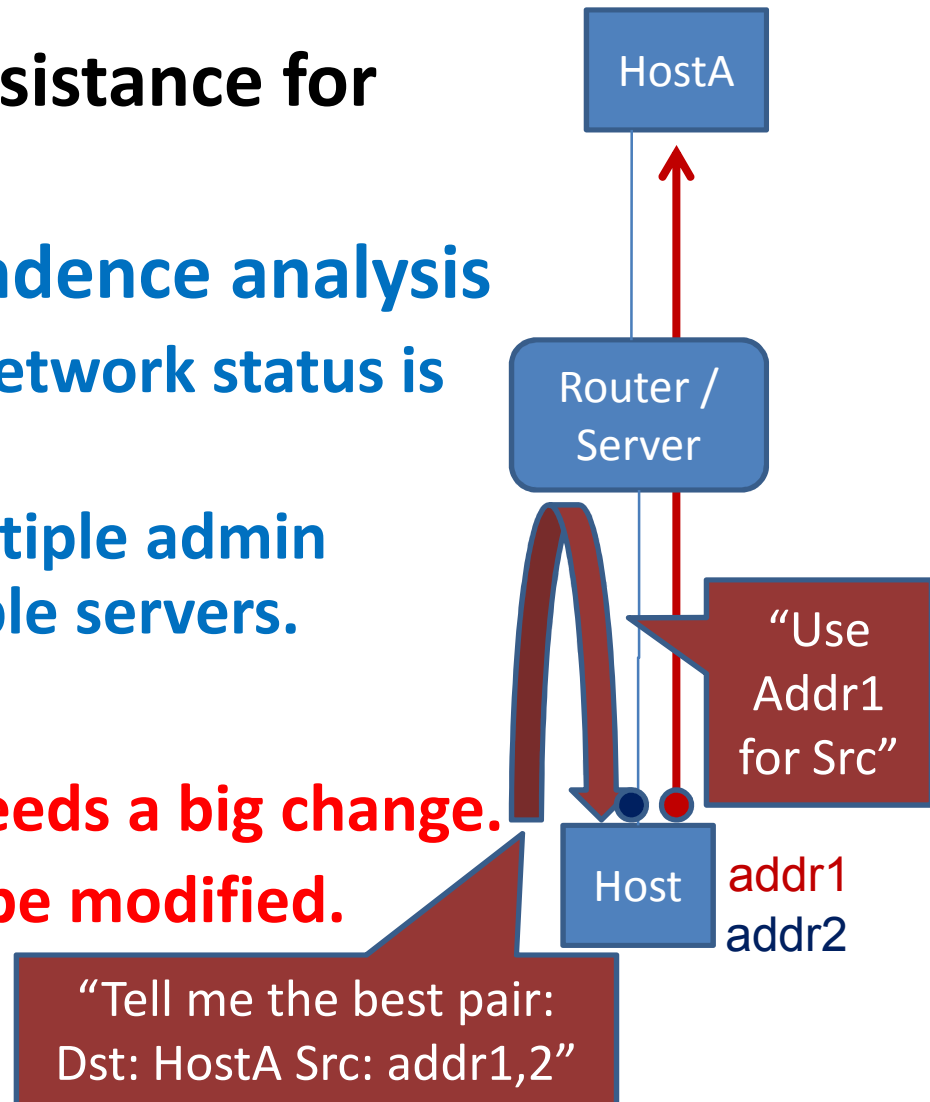
- E.g. “RFC 3484 Policy Table Delivery by DHCPv6”
 - draft-fujisaki-dhc-addr-select-opt-03.txt
- Requirement correspondence analysis
 - Dynamicness depends on the transport mechanism.
 - Policy collision can happen when belongs to multiple admin domain simultaneously.
- Other Issue
 - OS with Policy Table needs no change.
 - Frequent updates can cause a lot of traffic



Proactive Approach

“A Question and An Answer Approach”

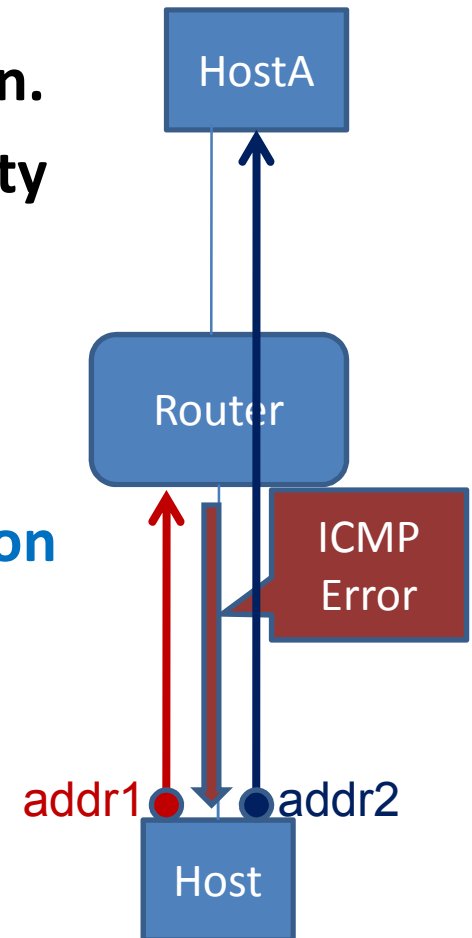
- E.g. “Routing system assistance for address selection”
- Requirement correspondence analysis
 - Dynamically changing network status is easily reflected.
 - Policy can collide in multiple admin domain and with multiple servers.
- Other Issues
 - Host implementation needs a big change.
 - Application also has to be modified.



Reactive Approach

“Try-and-Error Approach”

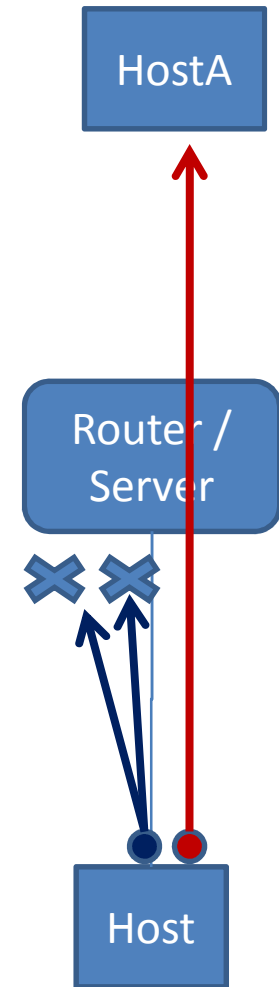
- E.g. RFC3484-update by M. Bagnulo
 - An ICMP Error notifies address mal-selection.
 - Hosts store cache of address-pair reachability
- Requirement correspondence analysis
 - Dynamically changing network status is easily reflected.
 - The usability can degrade badly dependent on application behavior.
- Other Issues
 - Per destination host cache can be so big.



The Most Reactive Approach

“All by Oneself Approach”

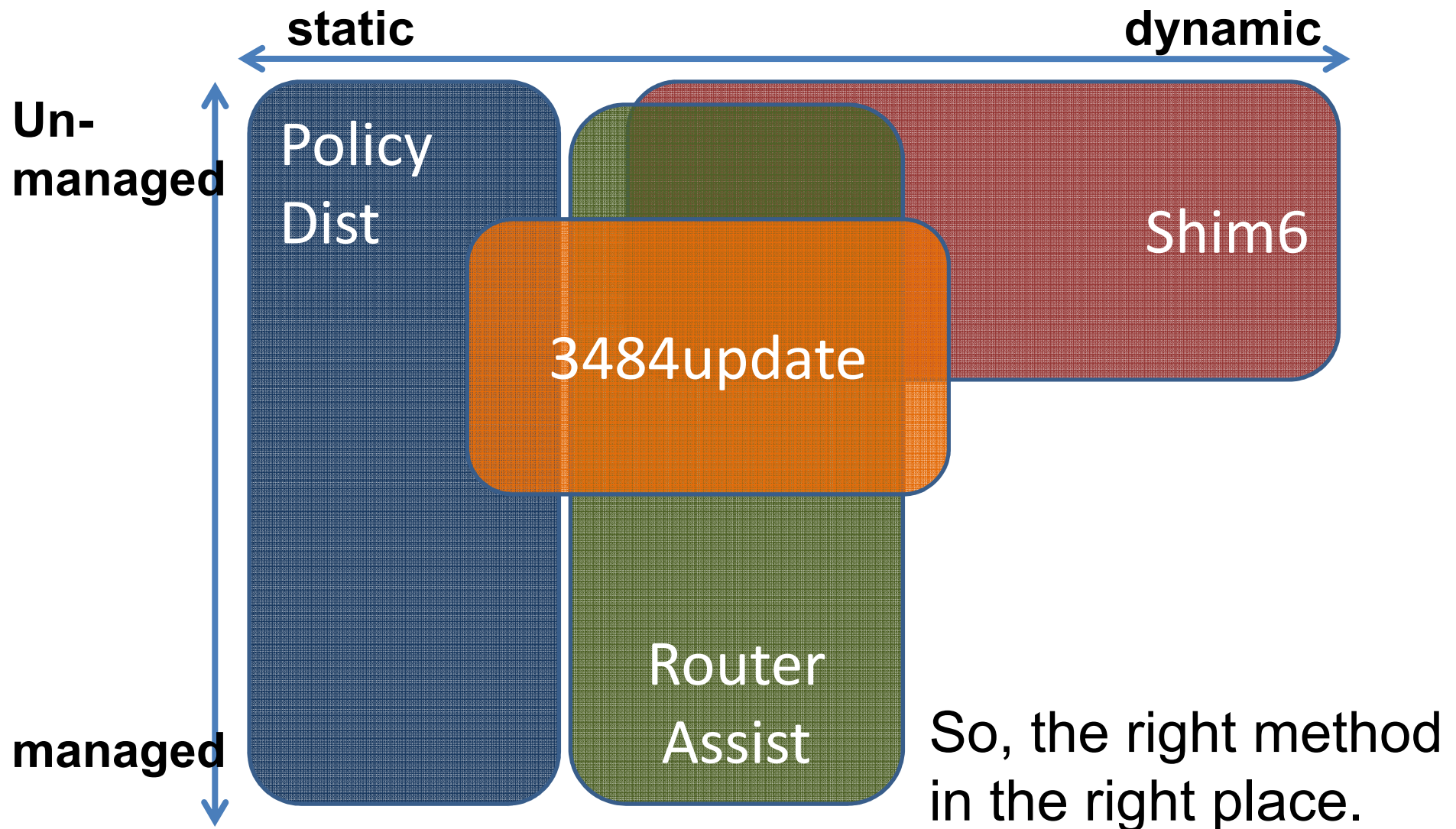
- E.g. Shim6
 - A host can perform failure detection and address cycling without a help from outside.
- Requirement correspondence analysis
 - A User may have to wait before finding working address pair.
 - Central control can only be implemented by packet filtering
- Other Issues
 - No router modification needed.
 - The host implementation has to be changed



Requirement correspondence analysis summary

Requirement	Policy Dist	Router Assist	3484update	Shim6
Effectiveness	Good	Good	Fair	Fair
Timing	Good	Good	Fair	Fair
Dynamic Update	Good	Good	Good	Good
Node-Specific	Good	Good	Fair	Fair
Appl-Specific	Fair	Fair	Fair	Fair
Multi-Interface	Fair	Fair	Good	Good
Central Control	Good	Good	Fair	Fair
Route Selection	Fair	Good	Fair	Fair
Other Issue	Freq. updates cause traffic	Big Impact on a host's stack	Big Impact on a host's stack	Big impact on a host's stack

Applicability Comparison



Next step

- Useful work ?
- Become v6ops work item ?
- Any questions and comments ?