Mobile IP Virtual Home Agents

David B. Johnson
Carnegie Mellon University

dbj@cs.cmu.edu

34th IETF, Dallas, December 4–8, 1995

The Home Agent Availability Problem

Fault tolerance is “easy” for home list data:

- Home agent can record data on disk
- Can record whole image of home list
- Could instead make log of home list changes
- Can record on disk using NFS, for example

But if home agent crashes or is reconfigured to new machine:

- New datagrams can be forwarded to its mobile nodes
- No new registrations can be processed

Problem exists even though home list data may still survive

Existing Solutions

Current draft suggests two possible solutions

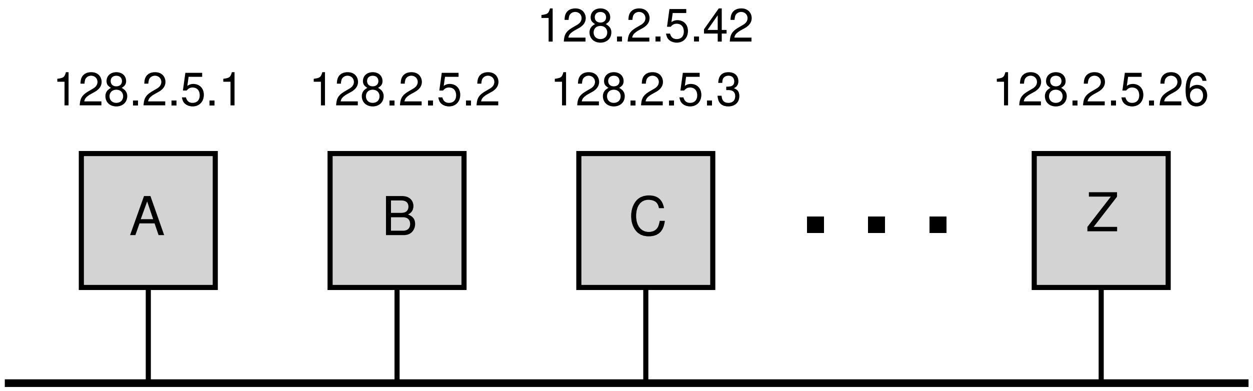
Reconfigure mobile nodes with new home agent IP address:

- Inconvenient, error-prone
- Requires manual configuration and/or new protocol
- Very hard to reconfigure mobile nodes away from home

Send to home agent using home network directed broadcast:

- Bothers all nodes on home network, not just home agent
- Directed multicast to home network “all agents” not defined

New Solution: Virtual Home Agents



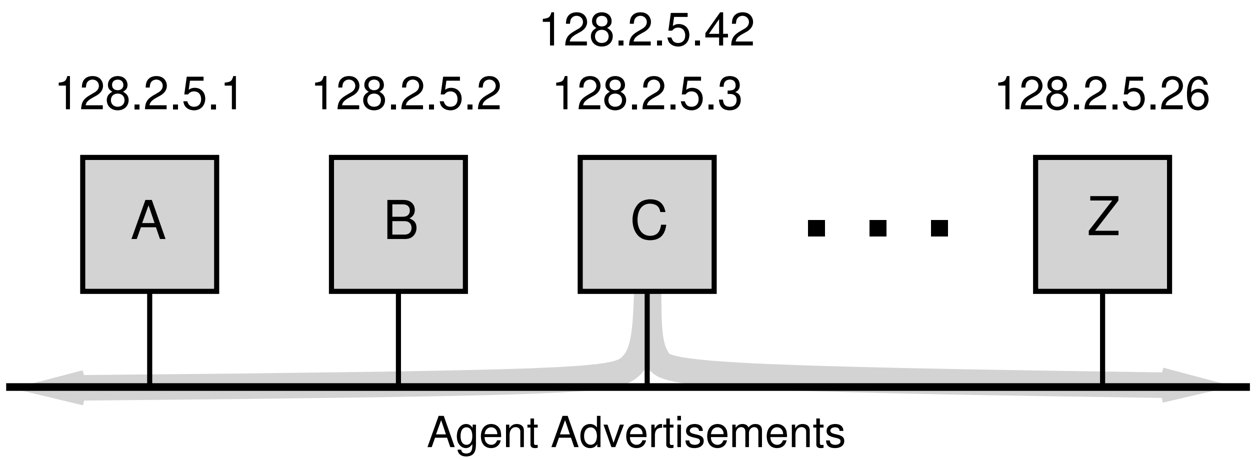
- Home network administrator picks an unused IP address
- Current node serving as home agent responds to this additional address as an alias
- Can change over time which node responds to this additional address
- No need to standardize which address is used

Changing Home Agents

Only one node at a time responds to home agent address

Other nodes may be capable of taking over as home agent

Backups monitor home agent's health through its Agent Advertisements



Electing a New Home Agent

When a backup thinks old home agent is dead:

- Initiate election to volunteer to become new home agent
- Sends broadcast, received by backups (and home agent)

When a backup (or home agent) receives a backup's query:

- If sender IP address $<$ own IP address, silently discard and abort own election if started
- Else, send unicast complaint and initiate own election

Completing an election you initiated:

- When receive complaint, abort own election
- Else, retransmit N times
- If still no complaint, take over as home agent