Passive DAD for Dynamic Host Configuration Protocol (DHCP)
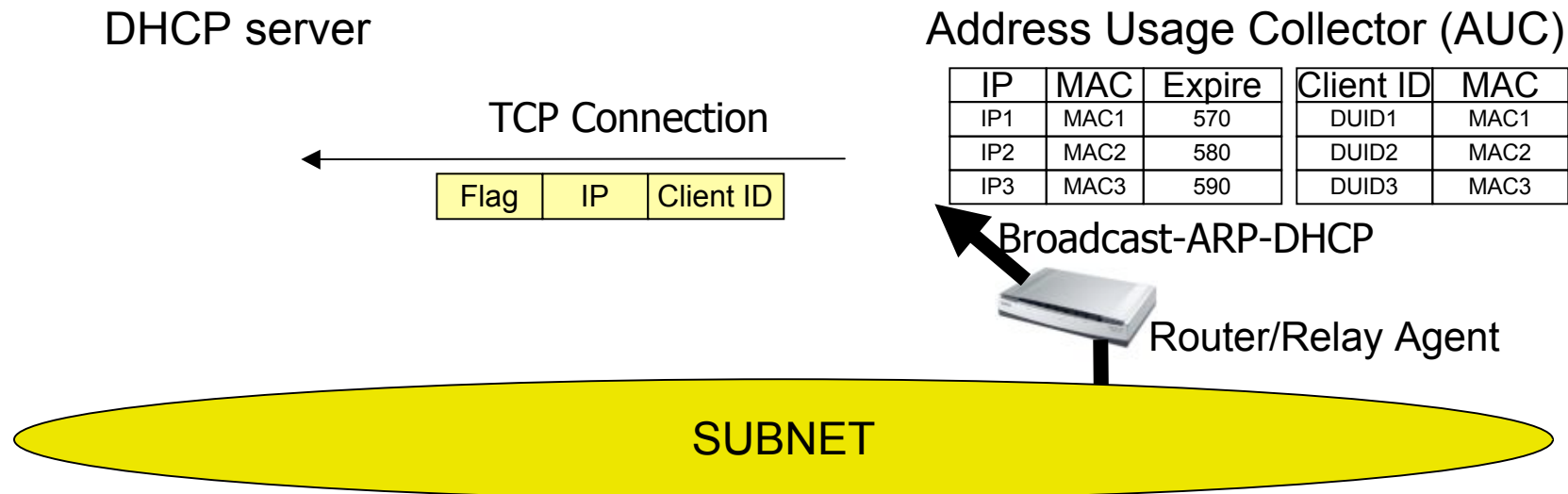
draft-forte-dhc-passive-dad-01

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Past Issues

- Support for Client ID (draft-ietf-dhc-3515id)

  - AUC builds a second table recording MAC - DUID associations.

- Traffic load between AUC and DHCP server

  - Results obtained in the Columbia University network show low traffic load.

pDAD - Architecture

DHCP server

Address Usage Collector (AUC)

IP	MAC	Expire	Client ID	MAC
IP1	MAC1	570	DUID1	MAC1
IP2	MAC2	580	DUID2	MAC2
IP3	MAC3	590	DUID3	MAC3

TCP Connection

| Flag | IP | Client ID |

Broadcast-ARP-DHCP

Router/Relay Agent

SUBNET

- AUC builds DUID:MAC pair table (DHCP traffic only).
- AUC builds IP:MAC pair table (broadcast and ARP traffic).
- The AUC sends a packet to the DHCP server when:
  - a new pair IP:MAC is added to the table
  - a potential duplicate address has been detected
  - a potential unauthorized IP has been detected
- DHCP server checks if the pair is correct or not and it records the IP address as in use. (DHCP has the final decision!)

Traffic load – AUC and DHCP
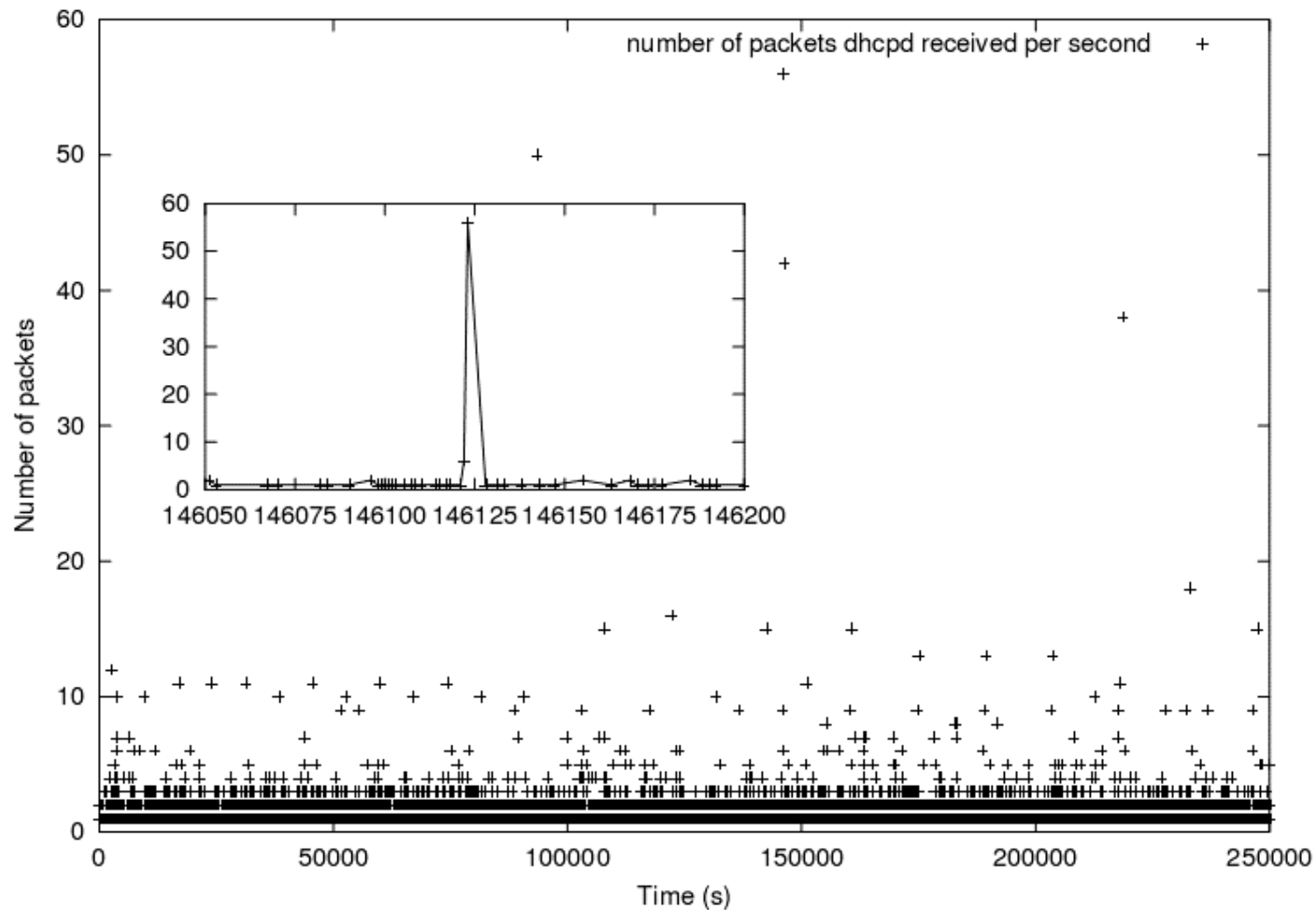
Packets/sec received by DHCP
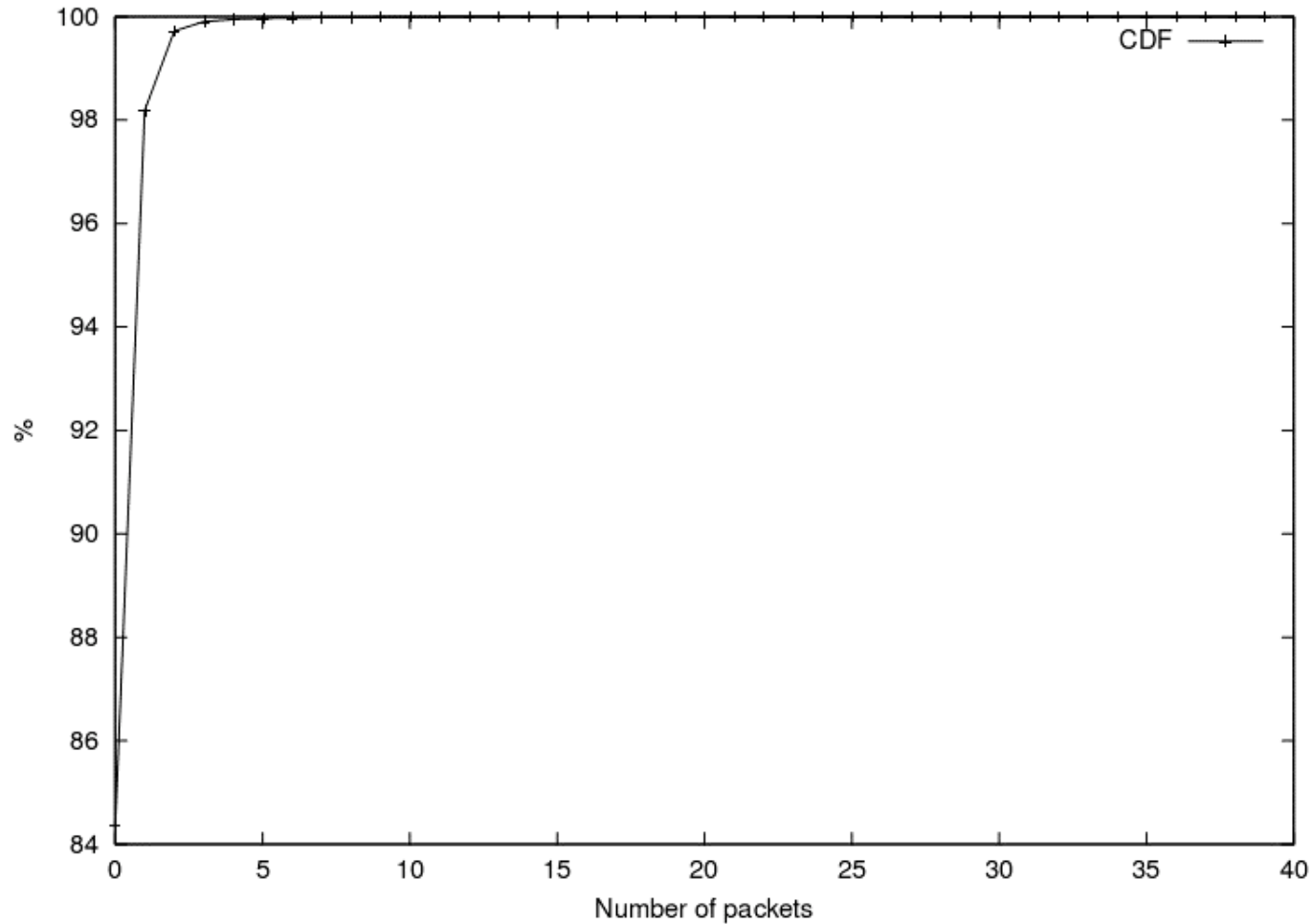
Conclusions

- pDAD is not performed during IP address acquisition
  - Low delay for mobile devices
- Much more reliable than current DAD
  - Current DAD is based on ICMP echo request/response
    - not adequate for real-time traffic (seconds - too slow!)
    - most firewalls today block incoming echo requests by default
  - A duplicate address can be discovered in real-time and not only if a station requests that particular IP address
  - A duplicate address can be resolved (i.e. FORCE_RENEW)
- Intrusion detection …
  - Unauthorized IPs are easily detected

Open Issues

- ## Security

  - Authentication of Relay Agents (AUCs)

- ## Other types of devices (non 802-like)

  - MAC and Unique ID

  - draft-ietf-dhc-3515id

- ## Changes to Relay Agent

  - AUC is a new logical entity – easy to integrate

- ## IPv6