MAC binding aging in OVN

Ales Musil
Senior Software Engineer | OVN Core
Agenda

- MAC binding
- Motivation
- Considered solutions
- Measurements
- Current solution
- Possible improvements
Topology
MAC binding row

- **_uuid**: ad00de8f-99bf-41a1-8058-4af13f6056b4
- **datapath**: 5f99830a-0c21-40b4-8f7d-83956447abc7
- **ip**: "192.168.10.15"
- **logical_port**: gw-public
- **mac**: "00:00:00:00:11:00"
- **timestamp**: 1666246695935
Motivation

▸ When?
  • Large scale environments
  • Environments with a lot of changes in topology

▸ Why?
  • Nothing stops the MAC binding table to grow infinitely
  • Size of SB has direct impact on OVN performance
Idle age column

- Column in MAC binding

  - Pros
    - Traffic is not disturbed
    - Easy to implement

  - Cons
    - Possible source of race conditions
    - High contention over SB DB
“Validating” flow

- Flow before the MAC binding check
- **Pros**
  - Traffic is not disturbed
  - We don’t have to check “idle_age” of corresponding flows
- **Cons**
  - Possible source of race conditions
  - High contention over SB DB
  - Possibly a lot of controller actions
Considered solutions

**Owner**

- ovn-controller would “own” the MAC binding row
- **Pros**
  - Easy to implement
  - Single controller is in charge
- **Cons**
  - It would cause traffic disruption
  - A lot of IPC with OvS to check the idle_age
TCP traffic
UDP traffic
Northd

- Northd monitors all MAC binding rows
- **Pros**
  - Very easy to implement
  - Only northd is in charge of aging
- **Cons**
  - It can cause traffic disruptions
  - It can cause SB DB contention on bulk removal
Configuration

- Configurable per logical router
  - `ovn-nbctl set logical_router <LR>
    options:mac_binding_age_threshold=<THRESHOLD>`

- Bulk removal limit
  - `ovn-nbctl set nb_global .
    options:mac_binding_removal_limit=<LIMIT>`
Possible improvements

Improvements

- Getting feedback from users
- Avoid removal of used MAC bindings
  - ovn-controllers updating the timestamp
  - Active approach, sending arp for MAC bindings that are about to expire
Resources

- Bugzilla RFE
- Measurement results
- Patch series
- Solution discussion
Thank you

Red Hat is the world’s leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.