Scaling out Cloud Environments with OVN

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OVN architecture

Define logical network topology
Update SB tables
Update each HV on any change (ovn-controller)

HIGH CPU utilization

Too many FLOWS, most irrelevant
Conditional monitoring

Define logical network topology

Update SB tables

Update only HVs that match conditions (ovn-controller)

Add network to condition

Add network to condition
OVSDNB protocol extension

• monitor_cond_request:
  Allows clients to monitor only parts of the database that match client’s conditions

• monitor_cond_change:
  Allows clients to iteratively change the conditions
API usage

```c
ovsdb_idl_add_clause_false(idl, tableA); // Start with empty table

while (1) {
    ovsdb_idl_loop_run(idl);
    ...
    ovsdb_idl_add_clause(idl, tableA, clause1);
    ...
    ovsdb_idl_loop_commit_and_wait(idl);
}
```

OVN patch – 250~ lines of code
Performance evaluation

• Using ovn-sandbox to simulate full DC
• 50 Hosts
• 20 ports per host
• 167 Networks, 6 ports per network
• 12% overlap (each network spread over 6 hosts)
• Total 1000 ports
Total CPU Cycles Count

# of OF Flows

- **Patch**
  - Total logical flows = 5010
  - Host 1 # flows 835
  - Host 2 # flows 927
  - ... (omitted)
  - Host 50 # flows 1111

- **Master**
  - Total logical flows = 5010
  - Host 1 # flows 5793
  - Host 2 # flows 5819
  - ... (omitted)
  - Host 50 # flows 5871
Host CPU utilization

SB-server CPU utilization

CPU %

Total # of Ports

CPU %

Total # of Ports
Influence of network spread over DC on SB
Code contribution to the community

• RFC OVSDB conditional monitoring extension (end of August 2015)
• 1\textsuperscript{st} patch series released to community (5\textsuperscript{th} January 2016)
• IBM started testing (February 2016)
• 7\textsuperscript{th} patch series released to community (13\textsuperscript{th} June 2016)
Questions?