

SDN_Agent and SDN_Controller Module Guide

1. Introduction

SDN_Agent and **SDN_Controller** modules belong to control plane routing modules. We explain the processing flow between these two. Please reference below Figure 1.

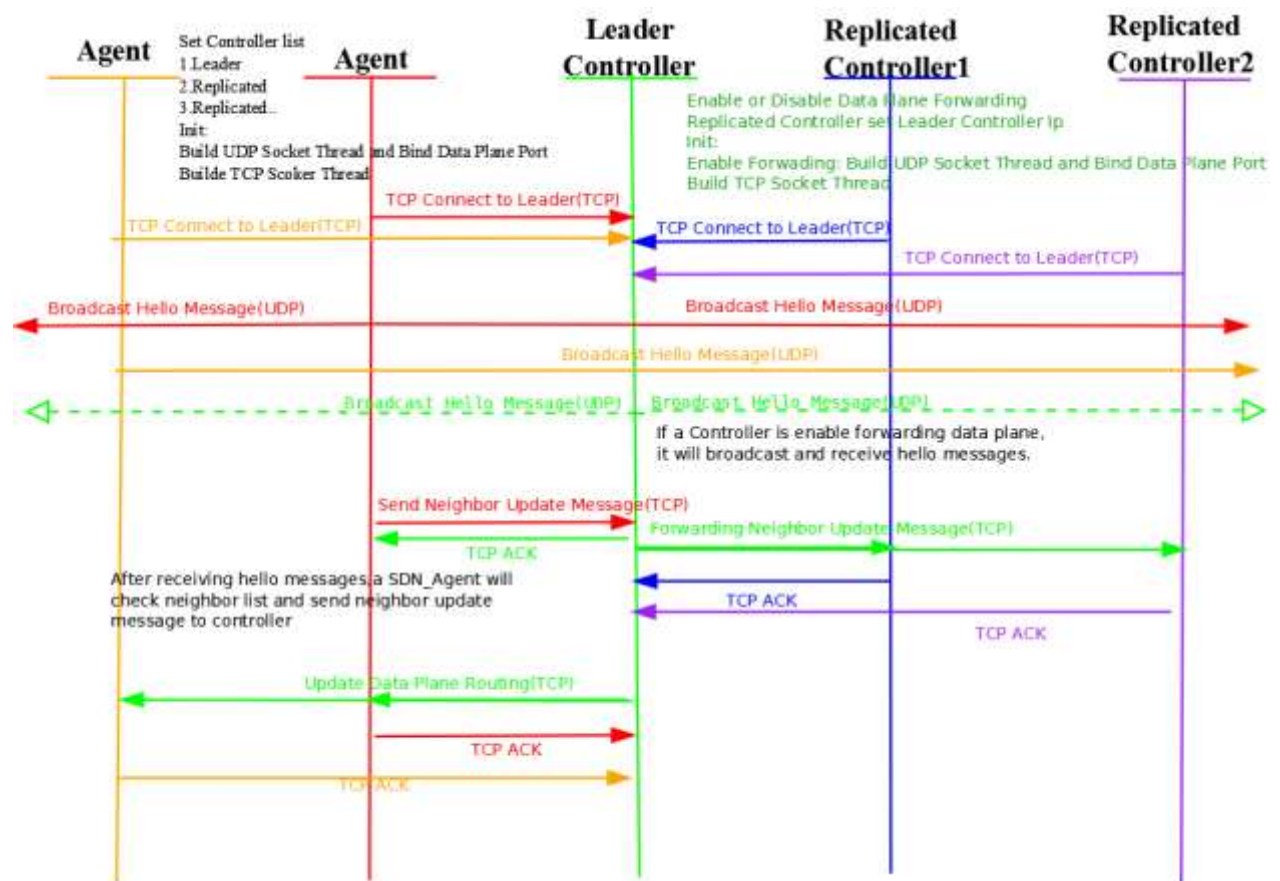


Figure 1 Processing flow between SDN_Agent and SDN_Controller Modules

SDN_Agent module will do actions as below:

- (1) Create a TCP/IP connection to leader **SDN_Controller** module for sending *Neighbor Update messages* and receiving *Routing Change messages*.
- (2) Create an udp port for periodically broadcasting *Hello messages* and receiving a *Hello message* from other **SDN_Agent** or **SDN_Controller** modules.
- (3) When receiving a *Hello message*, check its own neighbor list and send a *Neighbor Update message* to leader **SDN_Controller** module.

- (4) When receiving a *Routing Change message*, set the routing table in the **DataPlaneRouting** module located on the same node.
- (5) When the TCP connect to the leader **SDN_Controller** is broken, try to connect it again if it is reachable, otherwise, try another replicated **SDN_Controller**.

SDN_Controller module will do actions as below:

- (1) Enable or Disable Data Plane Forwarding. If it enables data plane forwarding, it will do the same as **SDN_Agent** module.
- (2) Decide to be one role replicated or leader controller.
- (3) As a replicated controller, do the action as below:
 - Create a TCP/IP connection to leader controller for sending *Neighbor Update messages* or transferring *Neighbor Update messages* that come from **SDN_Agent** modules.
- (4) As a leader controller, do the action as below:
 - When receiving a *Neighbor Update message*, it sends one copy to each replicated controller except the originating one.
- (5) Check and Update its own network topology information when receiving a *Neighbor Update message*.
- (6) When the network topology information is changed, it will calculate the routing rule by Dijkstra's algorithm.
- (7) Send *Routing Change messages* to those **SDN_Agent** modules under its control
- (8) If it enables data plane forwarding, set the routing table in the **DataPlaneRouting** module which located on the same node.

2. Module **SDN_Agent**:

Module Edit

Parameters Setting

Neighbor List Maintenance

Neighbor Record Out-of-date Interval
 (ms)

Hello Message Transmission Interval
 (ms)

Controller IP List

<input type="checkbox"/>	1st:	<input type="text" value="0.0.0.0"/>
<input type="checkbox"/>	2nd:	<input type="text" value="0.0.0.0"/>
<input type="checkbox"/>	3rd:	<input type="text" value="0.0.0.0"/>
<input type="checkbox"/>	4th:	<input type="text" value="0.0.0.0"/>
<input type="checkbox"/>	5th:	<input type="text" value="0.0.0.0"/>
<input type="checkbox"/>	6th:	<input type="text" value="0.0.0.0"/>
<input type="checkbox"/>	7th:	<input type="text" value="0.0.0.0"/>
<input type="checkbox"/>	8th:	<input type="text" value="0.0.0.0"/>
<input type="checkbox"/>	9th:	<input type="text" value="0.0.0.0"/>
<input type="checkbox"/>	10th:	<input type="text" value="0.0.0.0"/>

- **Neighbor List Maintenance**
 - **Neighbor Record Out-of-date Interval:**
The user can enter an integer time interval into this setting column. The unit of the time interval is micro second, and it will keep the record of the neighbor list until the specific time interval timeout.
 - **Hello Message Transmission Interval:**
The user can enter an integer time interval into this setting column. The unit of the time interval is micro second, and it will periodically broadcast Hello messages according the specific time.
- **Controller IP List**
The user can enable or disable the sequence controller IP

address.

3. Module SDN_Controller:

Module Edit

Parameters Setting

☐ Enable Data Plane Forwarding

Neighbor List Maintenance

Neighbor Record Out-of-date Interval
5000 (ms)

Hello Message Transmission Interval
2000 (ms)

Role of Controller

☐ Leader Controller

☒ Replicated Controller

Leader Controller IP 0.0.0.0

OK Cancel

- **Enable Data Plane Forwarding**
If a user wants the controller forwarding data plane packets, check enable this function, otherwise, uncheck disable this function.
If a user checks “Enable Data Plane Forwarding”, then “Neighbor List Maintenance” also enable to set. And the parameters of “Neighbor List Maintenance” are same as SDN_Agent module.
- **Role of Controller**
The user decides which role (Leader or Replicated controller) that SDN_Controller want to be. As a Replicated controller, then you must set the Leader controller IP address.