

Deployment Considerations for Lightweight 4over6

draft-sun-softwire-lightweigh-4over6-deployment

IETF 83-Paris, March 2012

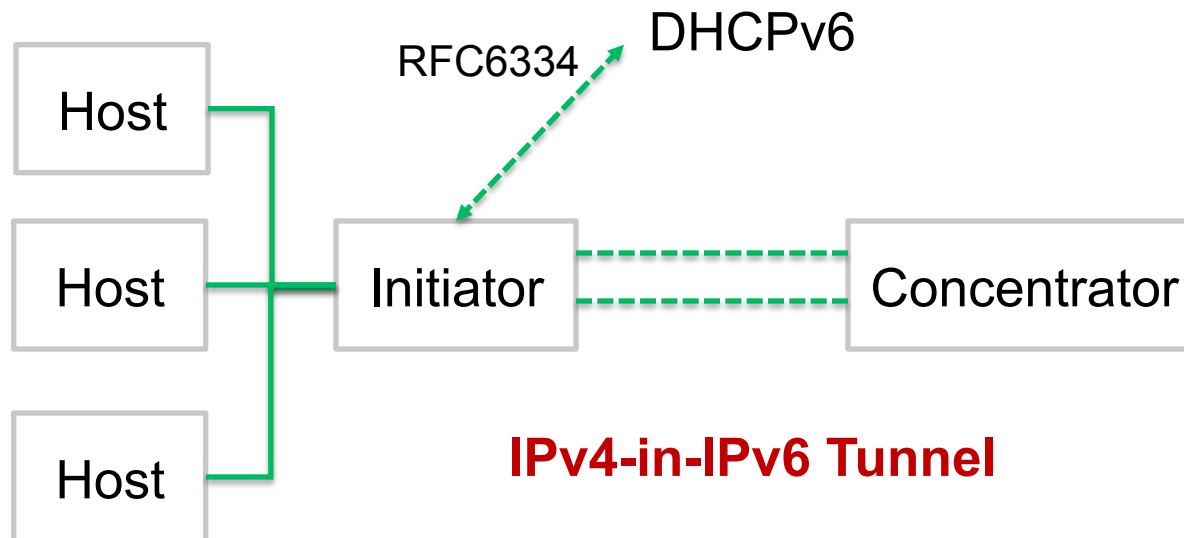
Q, Sun, C. Xie, and Y. Lee

Lightweight 4over6 Deployment Considerations

- Based on preliminary experimental deployment, this work describes various deployment models of Lightweight 4over6 and operational considerations for lightweight 4over6.

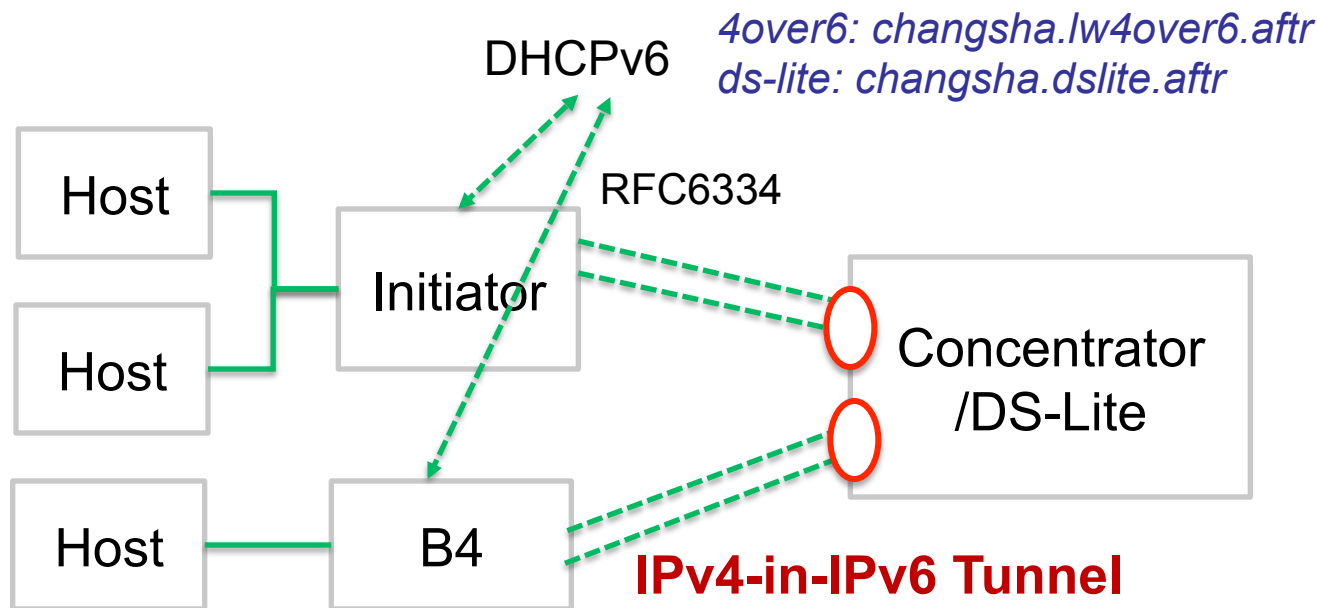
Case Studies

- Case 1: Standalone Deployment Scenario



Case Studies (Cont'd)

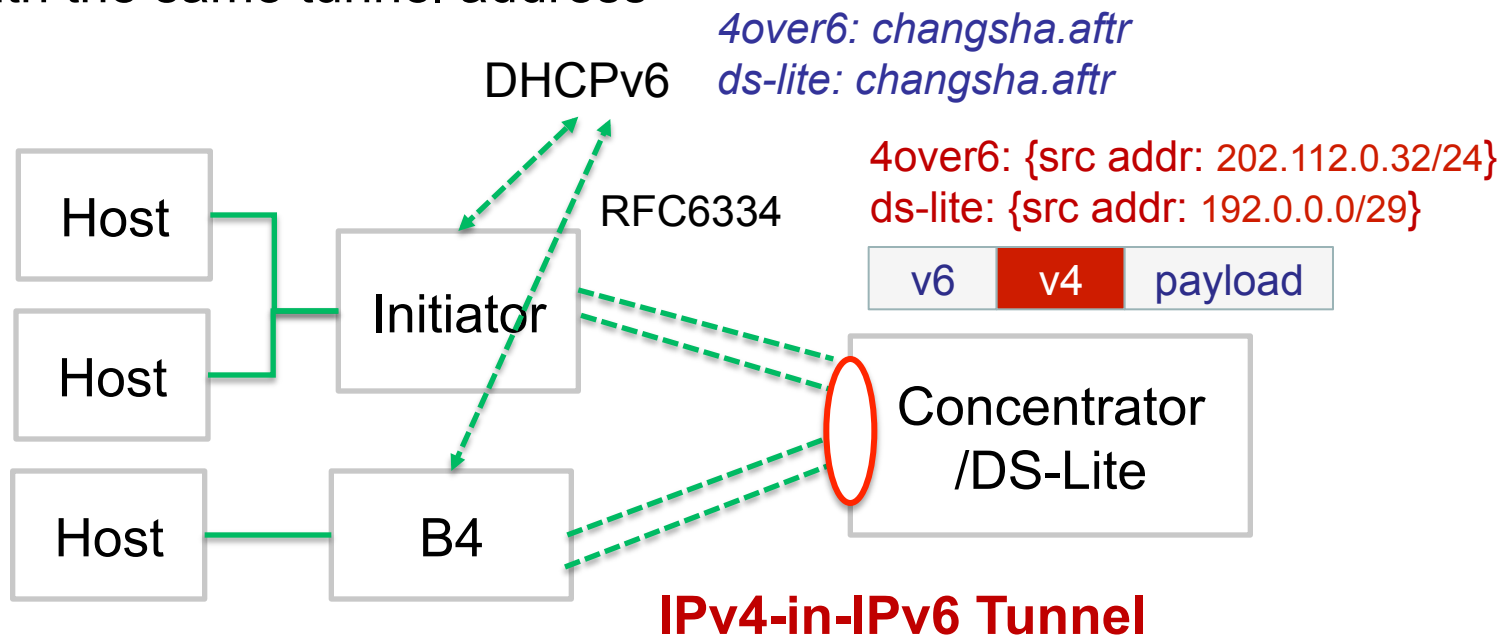
- Case 2: Integrated Network Element with Lightweight 4over6 and DS-Lite AFTR Scenario
 - Option1: Separated tunnel instances with different virtual addresses for DS-Lite and lw4over6



Requirement: Initiator and B4 can be distinguished in one network and different FQDNs should be configured accordingly.

Case Studies (Cont'd)

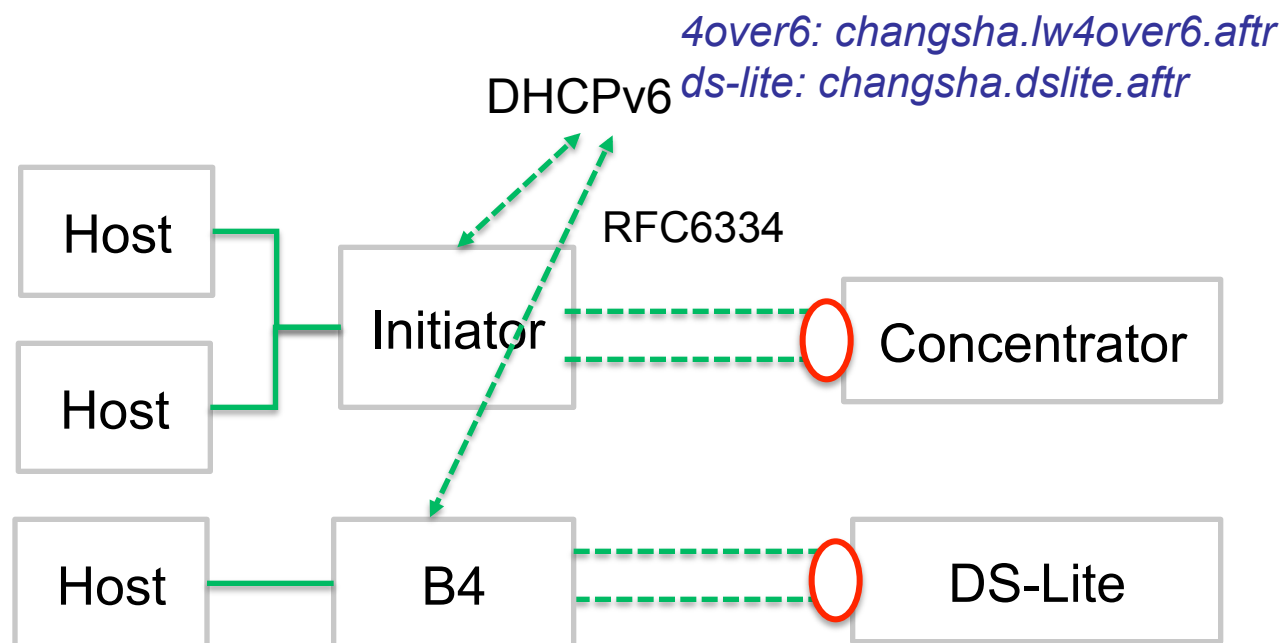
- Case 2: Integrated Network Element with Lightweight 4over6 and DS-Lite AFTR Scenario
 - Option2: Separated tunnel instances for DS-Lite and lw4over6 with the same tunnel address



Requirement: The network element need to examine every packet on its source IPv4 address.

Case Studies (Cont'd)

- Case 3: DS-Lite Coexistent scenario with separated AFTRs



Requirement: Initiator and B4 can be distinguished in one network and different FQDNs should be configured accordingly.

Overall Deployment Considerations

- Addressing and Routing
 - In Lightweight 4over6, there is no inter-dependency between IPv4 and IPv6 addressing schemes.
- Port-set Management
 - This port-set assignment should be synchronized between port management server and the Concentrator.
- Concentrator Discovery
 - Initiator can use the same DHCPv6 option [RFC6334] to discover the FQDN of the Concentrator.

Concentrator Deployment Consideration

- Lightweight 4over6 and DS-Lite share similar deployment considerations.
 - Interface consideration
 - MTU
 - Fragment
 - Lawful Intercept Considerations
 - Blacklisting a shared IPv4 Address
 - AFTR's Policies
 - ...
 - Refer to [\[I-D.ietf-softwire-dslite-deployment\]](#)

Concentrator Deployment Consideration(Cont'd)

- Logging at the Concentrator
 - Operators only log one entry per subscriber
 - The log should include subscriber's IPv6 address used for the softwire, the public IPv4 address and the port-set
- Reliability Considerations of Concentrator
 - The backup Concentrator must either have the subscriber mapping already provisioned
 - or notify the Initiator to create a new mapping in the backup Concentrator.

Concentrator Deployment Consideration(Cont'd)

- Placement of AFTR
 - In the "centralized model", the Concentrator could be located at the higher place. It is cost-effective and easy to manage.
 - In the "distributed model", Concentrator is usually integrated with the BRAS/SR.
- Port set algorithm consideration
 - Contiguous port range may introduce security risk because hackers can make a more predictable guess of what port a subscriber may use.
 - Non-continuous port set algorithms can be used to improve security.

Test Result

- It has good scalability, supporting more than one hundred million concurrent sessions on a normal PC.
- Lightweight 4over6 can be deployed rapidly, with little impact on existing addressing and routing.
- It is simple to achieve traffic logging.
- Lightweight 4over6 can support a majority of current IPv4 applications.
- Lightweight 4over6 can be coexistent with DS-Lite easily.

Conclusion and Next Steps

- We have deployed it in Hunan province, China.
Our test result:
 - It is simple and can be deployed rapidly.
 - It has good scalability.
 - It can support a majority of current IPv4 applications.
 - It can be coexistent with DS-Lite easily.
- Adopt the document as WG item?