Deployment Considerations for Lightweight 4over6

draft-sun-softwire-lightweight-4over6-deployment
IETF 83-Paris, March 2012

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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
  – Option 1: 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?