

Applicability Statement of NSIS Protocols in Mobile Environments

(draft-ietf-nsis-applicability-mobility-signaling-01)

Sung-Hyuck Lee, Seong-Ho Jeong,
Hannes Tschofenig, Xiaoming Fu, Jukka Manner

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Change history

- The major change made to the version –00
 - Re-arrangement of the issues addressed in the draft
 - Moved the generic route changes-related text in Section 4 into Appendix
 - Removed the 'use cases of identifiers' section, and instead, added the 'support for ping-pong type handover' section to Section 5
- Specifically,
 - Removed the terms, 'uplink', 'downlink', and 'local repair' in Section 2
 - Added more problems including 'Identification of the crossover node', 'Key exchanges', and 'AA-related Issues' to Section 3.1
 - Added the 'Multihoming-related issues' to Section 3.2.4
 - Removed the issues on 'how to immediately delete the state on the old path' in Section 3.2.
 - etc.

Main issue #1

- Crossover node (CRN) discovery-related issue
 - Question: Which layer should be responsible for the NSLP CRN discovery, NTLP (GIMPS) or NSLP (e.g., QoS-NSLP, NAT/FW)?
 - Description: Although the QoS-NSLP can detect the change of signaling path and discover the NSLP CRN by keeping track of SII, the NSLP CRN can implicitly be discovered at the GIMPS during the procedures of the peer discovery and the messaging association.
 - Processing overheads (NTLP vs. NSLP) and the functions of the identifiers in NTLP and NSLP.
 - Suggestions:
 - (a) the NTLP should discover NSLP CRN where the route of a flow may have changed, and report this to the NSLP
 - (b) the NSLP should decide whether it is a CRN which has to do Path Update (i.e., local repair)

Main issue #2

- Interfaces between mobility management protocols and NSIS protocols
 - Question: Is it necessary to define a Mobile IP-specific API in NSIS, or a common triggering mechanism between routing and NSIS processes to monitor the operations of other mobility protocols?
 - Description: To continually support the existing NSIS state after handover, NSIS protocols need to monitor the procedure of Mobile IP and then to react to the mobility events. That is, an NSIS implementation needs to be developed to react based on the endpoint notification.
 - Which information should be used from the mobility management protocols?
 - How and what information can the NSLP expect from NTLP, or directly from the routing interface after a mobility event happens?
 - How is the binding update interval coordinated with the NSIS signaling interval?
 - Suggestion: Common triggering mechanism??

Main issue #3

- Invalid NSIS Responder (NR) Problem
 - Question: How/by who can RESPONSE message be sent to the corresponding QNI if QNR (e.g., an MN) performs handover before the receipt of the message?
 - Description: If the old AR is the last node on the old path due to the MN's handover, its QoS-NSLP may trigger an error message to indicate that QoS-NSLP messages (e.g., RESERVE) cannot be forwarded any further. In this case, an error message should not be sent to avoid any teardown on the old path before re-establishing the state along the new path (make-before-break handover).
 - Suggestion: Use of handover_init (HI) field of the Mobility object.
 - Identification of the last node in mobility scenarios

Main issue #4

- Authorization-related issues with teardown
 - Question: When tearing down the obsolete state after CRN discovery, can the teardown message be sent toward the opposite direction to the state initiating node?
 - Description: This leads to an authorization problem because a node which does not initiate signaling for establishing the QoS-NSLP state may delete the state.
 - Suggestion: disabling of "reverse removal". Only a state installer can perform teardown.
 - It is referred as the session/reservation ownership problem (draft-tschofenig-nsis-sid-00.txt).
 - Additional question,
 - Is it necessary to use the tear-down message to release the old state?
 - The old state will time out by using soft state as the general approach.

Main issue #5

- Optimal refresh timer value for mobile environments
 - Question: How should the refresh time be set up according to various mobility scenarios?
 - Description: In the frequency handover scenarios, the maintenance of state on the old path for a long time is not necessary. The QoS-NSLP needs to choose appropriate refresh intervals depending on the network environment (e.g., access network, or core network) to reduce the waste of resources.
 - In the case where the soft state approach is preferred to any explicit tear-down approach in order to release the old state in mobility scenarios

Main issue #6

- CRN discovery and Path Update on the IP-tunneling Path
 - Question: How to discover the CRN and perform Path Update on the tunneling path?
 - Description: When IP-tunneling is used in the MIP-based network, it is also needed to perform the path update on the tunneling path.
 - If the CRN is located on the tunneling path, how can the CRN be discovered for the path update?
 - When/how to re-setup the state and remove the old state on the tunneling path?
 - If route optimization is used after IP-tunneling, when should the state on the tunneling path be removed?
 - Comments from ML
 - The operation on the tunneling path can be related to flow ID management.
 - Do we need to maintain the tunneling path as backup route after RO?

Other possible issues

- Localized Path Update
 - Issues on the interaction between the micro-mobility management protocols (e.g., HMIP, FMIP, etc.) and NSLP protocols.
- Multihoming-related issues
 - Load balancing/sharing, selection of an optimal path, etc.
- Priority of signaling messages (of MN rather than that of fixed hosts)
 - should a high priority be given to the signaling message to check the availability of resources in a new access network?
- Update of firewall rules and NAT bindings
- Re-use of NAT/FW-NSLP's old state
- Key exchange
- AA issues

Next steps

- Identify and clarify the following issues
 - The security-related issues
 - The QSPEC-related issues
 - Layer 2-related issues (e.g., wireless link bandwidth)
- Define design choices for the NSIS protocols
- Evaluate the design choices
- Find answers and make a decision before protocols are frozen

Thank you for your attention!

Please give comments on the NSIS mailing list.