Recent changes to RFC 6126bis

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Draft-ietf-babel-rfc6126bis is the Standards Track successor to RFC 6126 (Babel) and RFC 7557 (Babel Extension Mechanism).

A number of clarifications, tightenings and loosenings, but few new features:

- improved neighbour discovery and link sensing:
  - unicast Hellos;
  - unscheduled Hellos;
- more extensible packet format:
  - mandatory sub-TLVs;
  - packet trailer (new in -06).
Unicast Hellos

In RFC 6126, all TLVs can be sent over unicast except Hellos, which must be sent over multicast (or multi-unicast).

RFC 6126bis adds a new kind of Hello, the unicast Hello:

- sent over unicast to a single neighbour;
- all the features of an ordinary (multicast) Hello.

Useful:

- on link layers with outrageously expensive multicast;
- to carry a Hello sub-TLV in a unicast packet (e.g. timestamp).

Not required by the DTLS extension.
Unscheduled Hellos

In RFC 6126, every Hello resets the link-quality timer. Complicated to send a Hello at an arbitrary time.

RFC 6126bis adds an unscheduled Hello:
  – doesn’t reset any timers;
  – all the other features of an ordinary Hello.

Useful for sending a Hello sub-TLV (e.g. timestamp) at an unexpected time.
Mandatory sub-TLVs

In RFC 6126, a Babel packet is a sequence of TLVs. An unknown TLV is silently ignored.

In RFC 7557, a TLV can contain sub-TLVs. An unknown sub-TLV is silently ignored.

In RFC 6126bis, there are mandatory sub-TLVs. An unknown mandatory sub-TLV causes the whole enclosing TLV to be ignored.

This makes the protocol dramatically easier to extend (See draft-ietf-babel-source-specific and draft-chouasne-babel-tos-specific.)
A Babel packet has three parts:

- the **packet header**, of fixed size;
- the **packet body**, a sequence of TLVs;
- the **packet trailer**, silently ignored in RFC 6126/7557.

In RFC 6126bis, the packet trailer is a sequence of TLVs (just like the packet body).

**HMAC extension**: carries HMACs, cover the **packet body**.

**Tradeoff**: implementation vs. specification simplicity.

**New in -06**: please review.
Compatibility with RFC 6126

Unicast Hellos and mandatory sub-TLVs are incompatible extensions. All implementations must learn to parse them before implementations can start sending them.

Current status:

- babeld: done;
- BIRD: done;
- sbabeld: done;
- David’s Top Secret Implementation: done;
- FRR: not done.
Conclusion

RFC 6126bis has few new features:
- improved neighbour discovery and link sensing:
  - unicast Hellos;
  - unscheduled Hellos;
- more extensible packet format:
  - mandatory sub-TLVs;
  - packet trailer (new in -06).

Some of these features are incompatible with RFC 6126, but a flag day will not be required.