Babel to Standards Track
what may change

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If Babel is to become a Standards Track protocol:

- some changes are **obviously needed** (bug fixes, obvious omissions);
- some changes **might be a good idea**;
- some changes **might be a bad idea**;
- some changes **would cause it to no longer be Babel**.
How to build a Babel:

- start with a naïve distance vector protocol (RIP);
- add explicit neighbour sensing sub-protocol (Hello/IHU);
- add a loop-avoidance algorithm (inspired by EIGRP, but stronger);
- add a starvation-avoidance algorithm (somewhat inspired by DSDV and AODV, but faster and still complete).
The Tao of Babel

General guidelines behind the design of Babel:

– whenever possible, **build desirable features into the data structures and the underlying algorithms**, not into ad hoc mechanisms;

– don’t include a mechanism if it’s not needed.

– if a mechanism is needed, make it as simple as possible, **don’t try to generalise from just one example** (or, worse, zero examples).
The Tao of Babel: example 1

Wireless nodes with **multiple radios** are available:

Such nodes sometimes establish **neighbour relationships with themselves:**

The **loop-avoidance algorithm** will immediately discard any route that goes through a looped link. Babel has **no explicit mechanism to avoid self-association.**
The core Babel protocol has a simple encoding for time intervals: 1/100ths of a second in a 16-bit field.

The RTT extension needs to encode high-resolution time. It uses microseconds in a 32-bit field.

It is easier to deal with two simple, specialised encodings than with a single complex, general one.
The Babel specifications (RFCs 6126 and 7557) have served us well. In the words of one implementer, “the spec seems clear enough”.

We keep a list of known bugs and omissions. It is four entries long.

We keep a list of things that weren’t clear enough to the implementers. This is even more precious than the previous list.
Editorial changes

While the existing RFCs have served us well, they can take some editorial improvements.

Examples:

- merge the extension protocol into the base document;
- tighten some requirements, notably error handling.
Changes to the protocol

A number of changes to the protocol have been suggested.

Examples:
- forbid some router-ids (all-0 and all-1);
- expand the size of metrics from 16 to 32 bits;
- add a transitive bit;
- clean up the packet format.

A Babel WG will need to consider such changes carefully, keeping the Tao of Babel in mind.
Conclusion
An optimistic note

A Standards Track Babel is achievable in finite time. If we are careful, it will still be Babel.