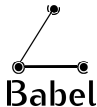


Babel to Standards Track what may change

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Introduction

Stating the obvious

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**.

Background: how to build a Babel

Babel for busy people

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 Tao of Babel: example 2

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**.

Bugs and omissions

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**.