Composite Link Framework Issues

Functional requirement #1

The solution SHALL provide a means to summarize routing advertisements regarding the characteristics of a composite link such that the routing protocol converges within the timeframe needed to meet the network performance objective.

To Aggregate or Not?

- Pro:
  - More scalable: less information in IGP
  - Quicker path computation (NBD)
- Con:
  - Crankback during signaling

Crankback

- Loop
  - Compute path across network
  - Signal path
  - If success, exit
  - Exclude link that just failed
  - Iterate

Costs of crankback

- Still have to advertise composite link in IGP
  - Only saved components
- Each failed signaling attempt takes time
- There may not be a working path
- Ergo: signaling may take an arbitrarily long time
- Failure information from one setup may not apply to another: start over

Benefits of crankback

- Skip characterizing component
  - Max bandwidth (4B + 2B overhead)
  - Max reservable bandwidth (4B + 2B overhead)
  - Unreserved bandwidth (4B + 2B overhead)
  - Latency (4B float + 2B overhead)
  - Component Index (4B id + 2B overhead)
  - Delay variation (4B id + 2B overhead)
  - TLV overhead (2B)
- Total: 36B per component

IS-IS scalability

- IS-IS LSP space: 256 possible fragments
- Fragment: 1200B, partially filled, fixed header
- Estimate: 80% fill
- Some overhead for other TLVs: 75% fill
- Available space: 230KB -> 7,000 components
- Flooding time: 230KB @ 1Gb/s ~= 2ms
  - Incremental flooding makes this MUCH shorter
  - Typically 1 LSP

More LSP space

- Increase fragment size
- Jumbo frames
- More fragments: RFC 5311
  - Add additional system IDs
  - Gives 256 fragments per ID