

BGP-LS for IS-IS Flood Reflectors

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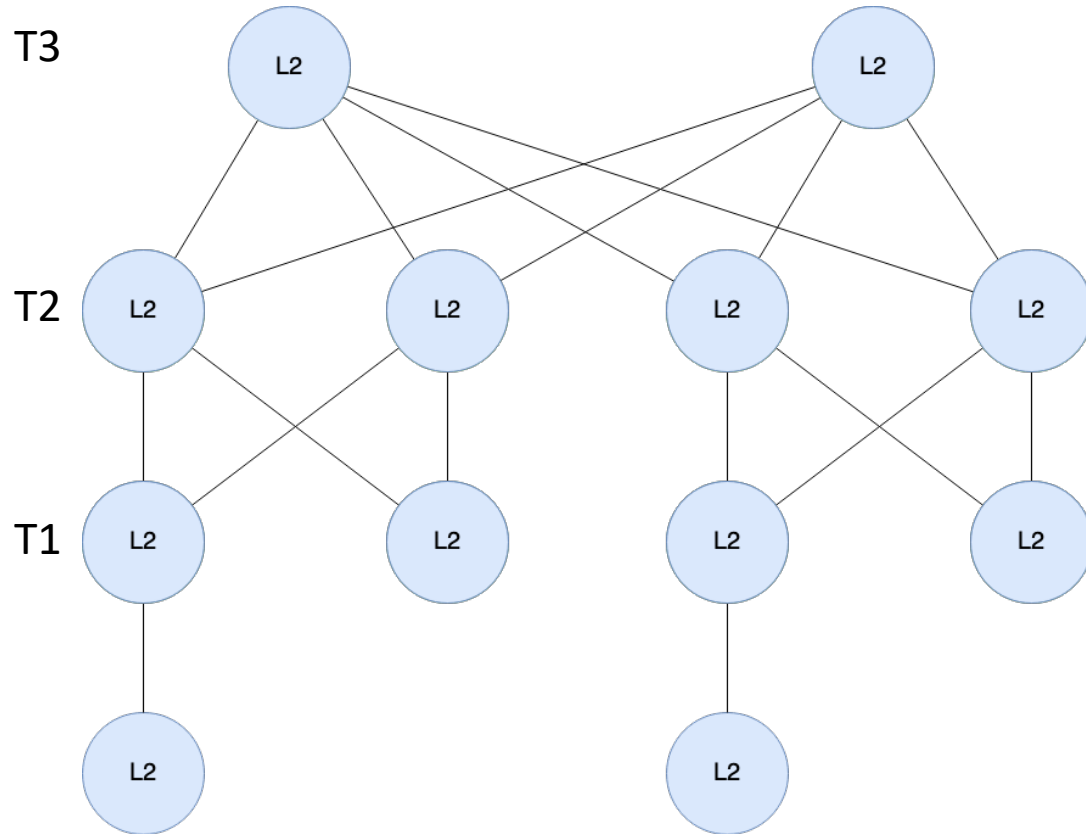
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IETF112

Let's define the problem.

- We all know that **flat single area** IGPs can come with some pitfalls.
 - **Flooding** – every node needs to know.
 - **State** – every node needs to remember.
 - **Convergence** – every node needs to compute.
- This gets even worse as the network is scaled.
- However, these deployments may be desirable for things like SR.

Let's visualize the problem.



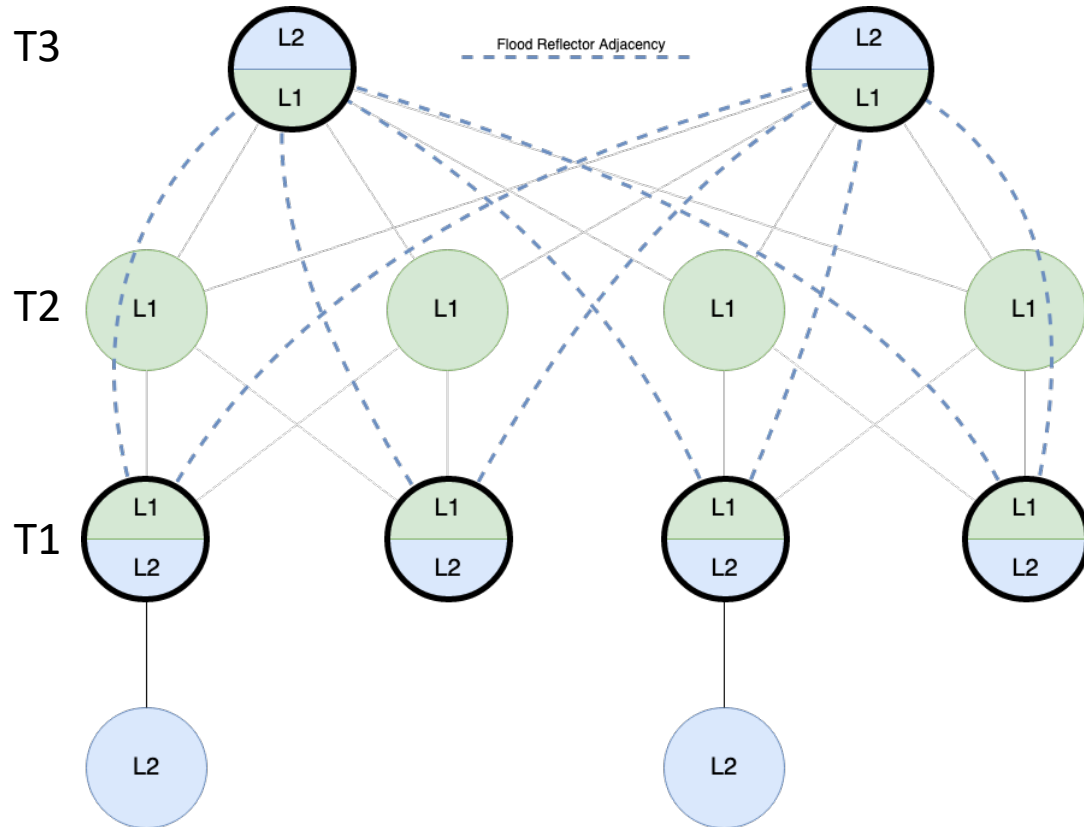
- Lots of state.
 - Maintain more adjacencies.
 - Maintain a larger LSDB.
- Lots of flooding.
 - Distribute more LSPDUs.
- Slower convergence.
 - More SPF runs and longer runtimes.
 - Higher resource utilization further slows SPF.

What's the solution?

- IS-IS Flood Reflection!
 - Based on existing LSR work.
 - <https://datatracker.ietf.org/doc/html/draft-ietf-lsr-isis-flood-reflection-04>

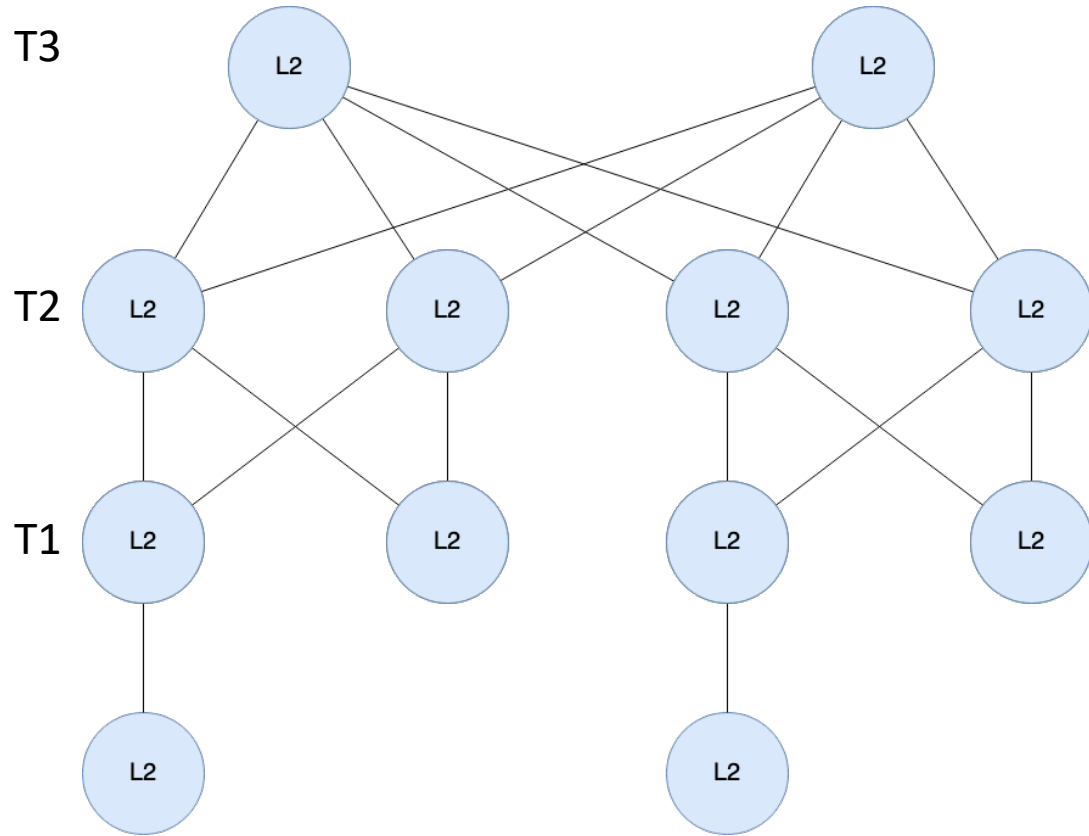
- Flood Reflectors are a *bit* like BGP Route Reflectors in that we:
 - Choose a Cluster ID.
 - Designate one or more Flood Reflectors.
 - Designate one or more Flood Reflector Clients.

Let's visualize the solution.

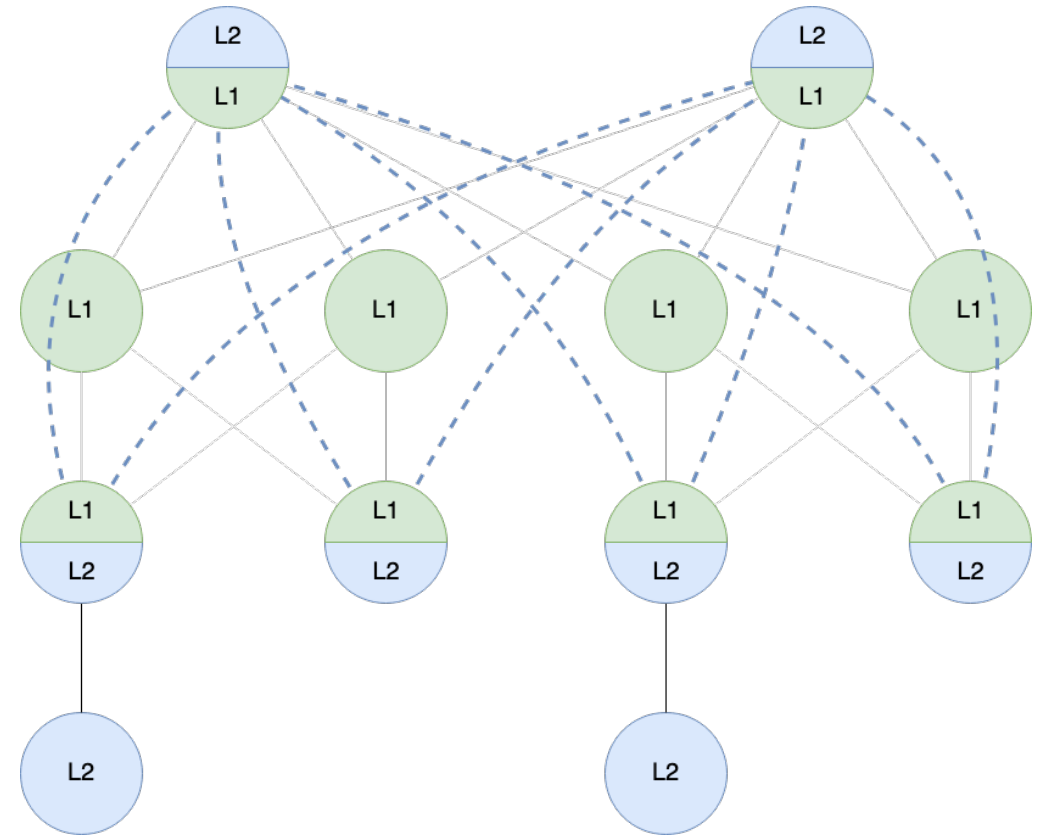


- Split L2 into multiple flooding domains.
- L1/L2 nodes establish “Flood Reflector” adjacencies in **Level 2**.
 - Flood Reflectors at T3
 - Flood Reflector Clients at T1
- L1 nodes provide forwarding for Level 2 routes.
 - e.g. Leak L2 routes from T1 into L1.
 - Other methods detailed in the LSR draft.
- L1 and L2 converge independently of one another.

Before and after.



Level 2 Topology



Flood Reflector Topology

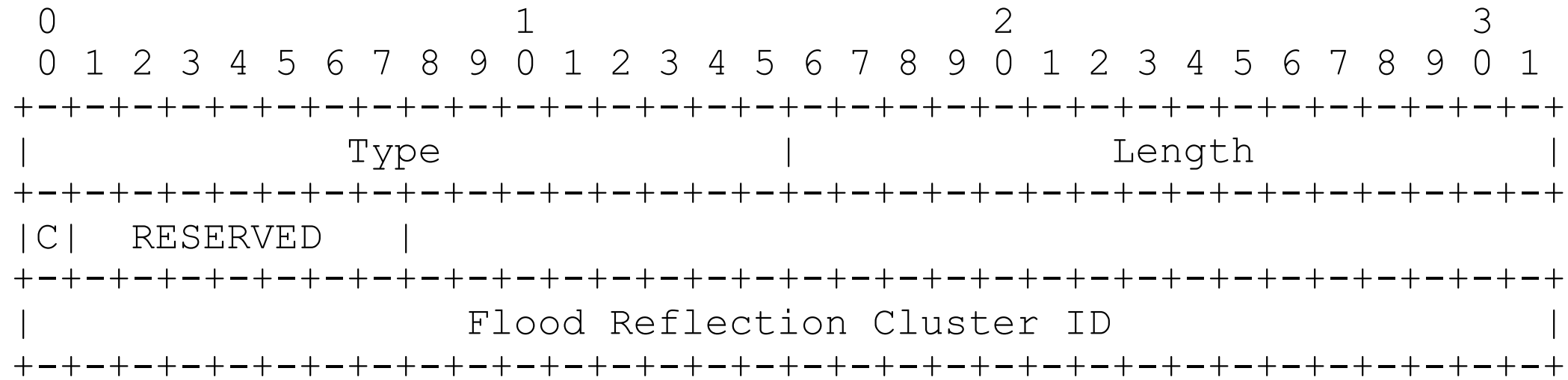
Did we improve scale?

- **Example** | Consider a fully meshed topology of 6 L1/L2 IS-IS nodes.
- Without Flood Reflection
 - Adjacencies = $n * (n - 1) / 2$
 - n = number of L1/L2 nodes.
 - 15 Adjacencies = $6 * (6 - 1) / 2$
- With Flood Reflection
 - Adjacencies = $R * n$
 - n = number of L1/L2 nodes.
 - R = number of Flood Reflectors
 - 8 Adjacencies = $2 * 4$

What about the other factors?

- Less links and adjacencies mean less LSPDUs.
- Less LSPDUs means less flooding.
- Less LSPDUs also means less SPF computation.

BGP-LS for IS-IS Flood Reflector TLV



- Requesting TLVs from the “*BGP-LS Node Descriptor, Link Descriptor, Prefix Descriptor, and Attribute TLVs*” registry.
- Facilitates necessary BGP-LS state for controllers.

What's next?

- Existing LSR work is already adopted, therefore we are requesting Working Group adoption here.
- Specific definitions of how these extensions would be advertised in conjunction with existing descriptors.
- Comments are welcome.

Questions?