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.

• 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 = $n \times (n - 1) / 2$
    • $n =$ number of L1/L2 nodes.
  • 15 Adjacencies = $6 \times (6 - 1) / 2$

• With Flood Reflection
  • Adjacencies = $R \times n$
    • $n =$ number of L1/L2 nodes.
    • $R =$ number of Flood Reflectors
  • 8 Adjacencies = $2 \times 4$
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?