0.1 4. Spiders: Building and Maintaining "Webs" of Connectivity

Spiders create webs that dynamically adapt to external stresses or breaks. A "web-based" approach for chiplet networks focuses on building a resilient mesh:

1. Web Construction: Each router sends out "threads"—short discovery packets—on all ports. Neighbors respond, forming local connectivity data structures.
2. Local Weave: Threads intersect and overlap, letting routers learn about multi-hop neighbors.
3. Damage Repair: If a link fails, local threads are resent to repair or reroute around the break.
4. Tension Metrics: Each link in the web holds a "tension" (latency, throughput) that can be monitored and used to shift traffic if congestion or errors rise.

Benefits:

- Resilience Through Redundancy: Overlapping "threads" ensure multiple known paths.
- Incremental Updates: Each node refines its local web structure.
- Ease of Local Addressing: Short IDs can be assigned to neighbors, aggregated as the web extends outward.