

DC Routing protocol requirements

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Why DC napkin protocol design team?

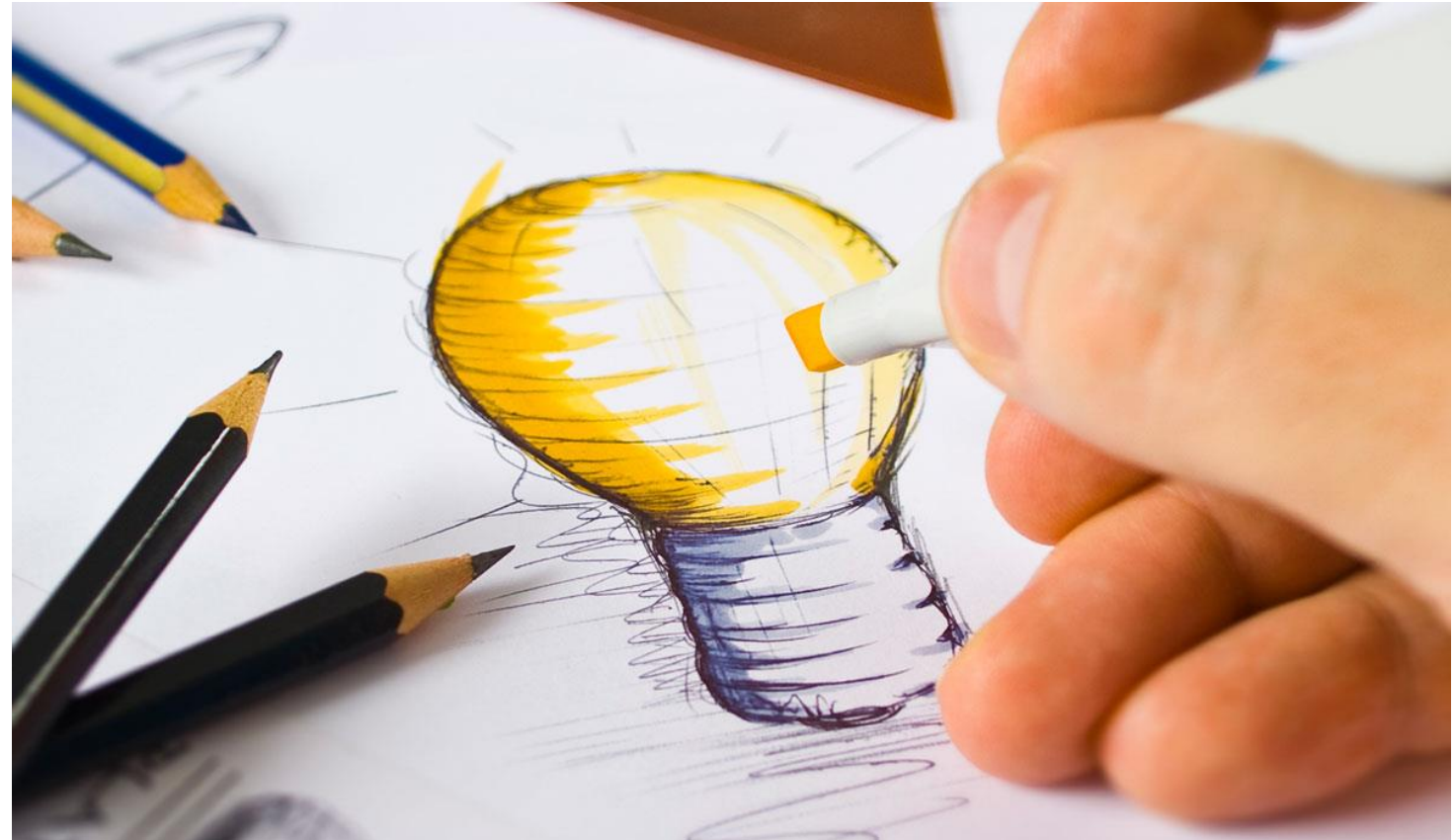
Because we are long time friends 😊



Why DC routing design team?

Seriously

- We know how to design routing protocols and networks



Why DC routing design team?

Seriously

- We know how to build routing protocols and DC's



Why DC routing design team?

Seriously

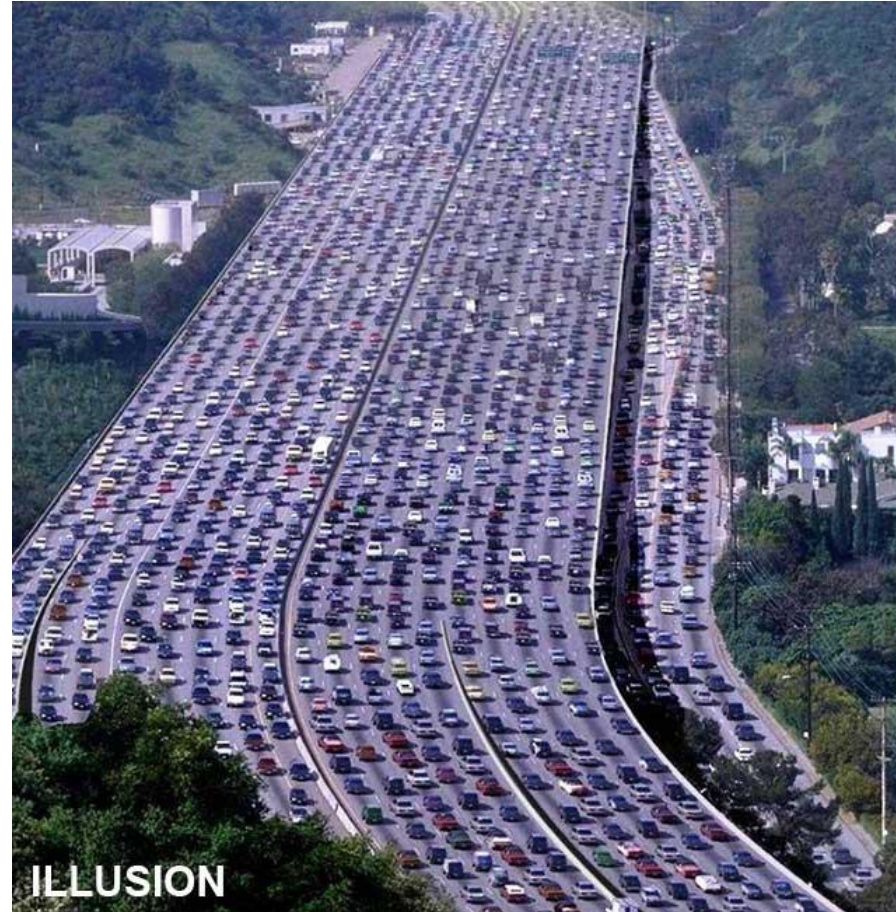
- We now how to operate routing protocols and orchestrate networks



Why DC routing design team?

Seriously

- And all of this at scale!



Why DC routing protocol req's draft?



Her wicked step mother wanted to be the most beautiful lady in the kingdom and would often ask her magic mirror,

Why DC routing protocol req's draft?

Avoid protocol beauty contest - Have a single set of requirements to be compared against



My LSA's are
better than
your LSP's!!!



I run the
Internet!!!

Why DC routing protocol req's draft?

We are just starting – we need your help!



Fabric definition

- The Fabric provides basic connectivity, with possibility to carry one or more overlays
- The Fabric provides no domain separation, if needed, to be handled by an overlay
- The Fabric **MUST** support non equidistant end-points
- The Fabric **MUST** support Spine and Leaf + isomorphic topologies (Butterfly and similar)
- The Fabric **MAY** provide interconnect facility for other fabrics
- The Fabric **MAY** support non Spine and Leaf topologies

Fabric's KPI's: single-dimensional and expected to be changed...

- The Fabric **SHOULD** support 250k routes @ 5k fabric nodes with convergence time below 250ms
- The Fabric **SHOULD** support 500k routes @ 7.5k fabric nodes with convergence time below 500ms
- The Fabric **SHOULD** support 1M routes @ 10k fabric nodes with convergence time below 1s
- Combination of # of routes vs # of paths vs desired convergence time will be discussed in a later version

Fabric routing protocol requirements

- The Fabric routing protocol **MUST** support load balancing using ECMP, wECMP and UCMP
- The Fabric routing protocol **MUST** support and provide facility for topology-specific algorithms that enable correct operations in that specific topology.
- The Fabric routing protocol **MAY** support any custom or adaptive load balancing algorithms

Fabric routing protocol requirements

- Fabric routing protocol **SHOULD** support route scale and convergence times of a Fabric mentioned above
- The Fabric routing protocol **SHOULD** support ECMP as wide as 256 paths
- The Fabric routing protocol **MUST** support various address families that covers IP as well as MPLS forwarding
- The Fabric routing protocol **MUST** support extensions to carry 3rd party data and Opaque data
- Encoding and transport will covered in a later version

Fabric routing protocol requirements

- The Fabric routing protocol **MUST** support inband as well as out of band management
- The Fabric routing protocol **MUST** support Zero Touch Provisioning (ZTP)
- The Fabric routing protocol **MUST** support Neighbor Discovery to facilitate ZTP.
- The Fabric routing protocol **MUST** be able to leverage BFD for neighbor state(RFC5880)
- The Fabric routing protocol **SHOULD** be capable of bootstrapping a BFD session(RFC5882)

Fabric routing protocol operational requirements

- The Fabric routing protocol **MUST** be able to support real time state notifications of routes and its neighbors state to facilitate control plane telemetry
- The Fabric routing protocol **MUST** be able to support on-demand snapshots of protocol state and real time state notifications of routes and its neighbors state to remote node(s) to facilitate control plane telemetry
- The Fabric routing protocol **MUST** be able to handle commission/decommission of a node as well as any node restart with a minimal data plane impact.

Fabric routing protocol requirements

Following items have been identified to be studied at a later time:

- gRPC/THRIFT/similar encodings
- Ability to function as an overlay
- Flowlets signaling
- Multicast
- Auto aggregation/conditional de-aggregation
- State representation NB
- Integration with PCE/SDNc

Fabric routing protocol requirements

QUESTIONS?

Fabric routing protocol requirements

Next steps?