

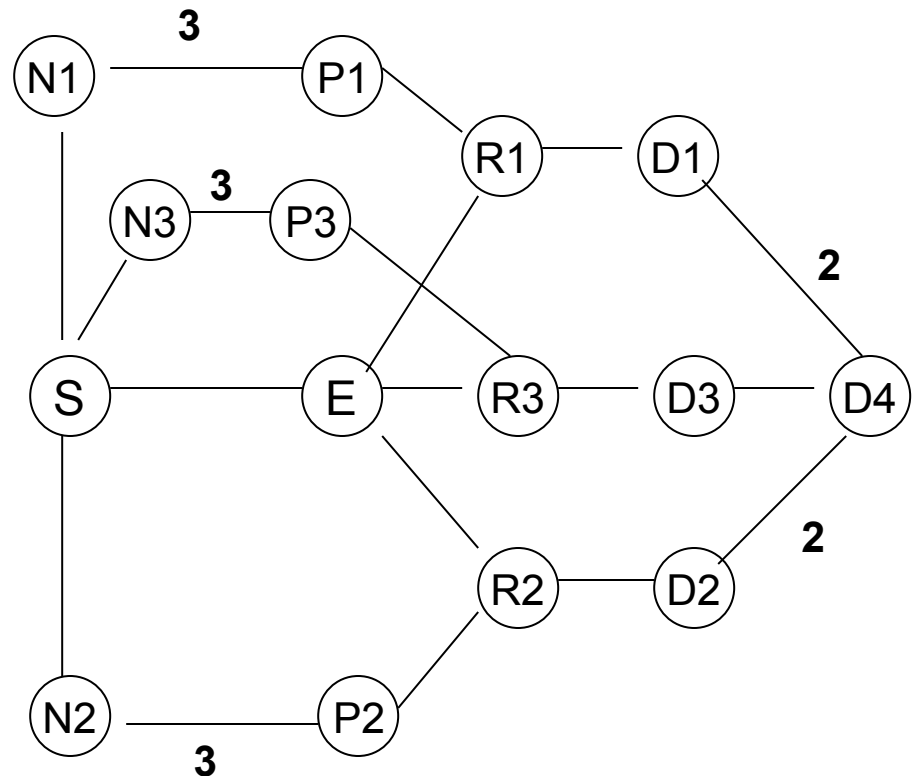
draft-litkowski-rtgwg-node-protect-remote-lfa

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# draft-ietf-rtgwg-remote-lfa

- To protect S-E link, P3 may be used as best PQ
- P3 provides only guaranteed link protection
- In reality, looking at the topology, P3 provides :
  - Node protection for D3,D4
  - Link protection for D1,D2
- Computing node protection ability of a PQ would require extra SPF (rooted at PQ) :



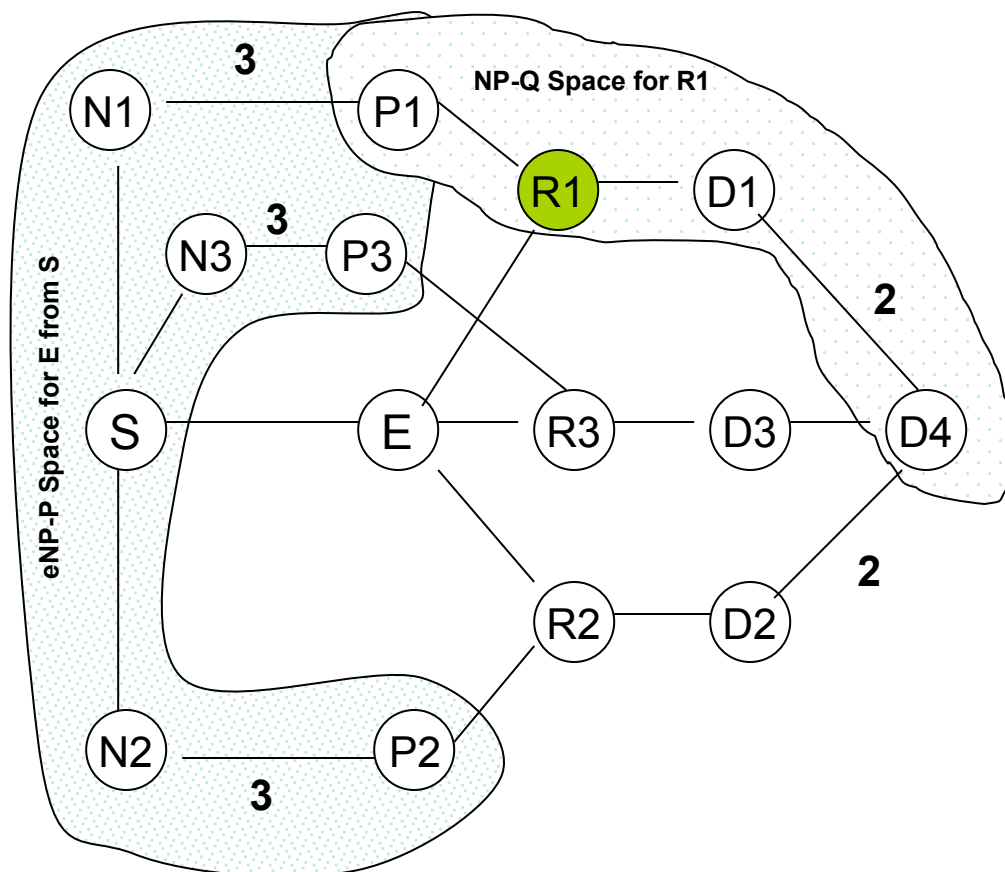
*draft-psarkar-rtgwg-rlfa-node-protection*

## Why guaranteed node protection for rLFA ?

- Transit node may crash !
  - HA not available everywhere
- In the framework of LFA policies, we need to be able to compare attributes of LFA and rLFA alternates : protection type is needed

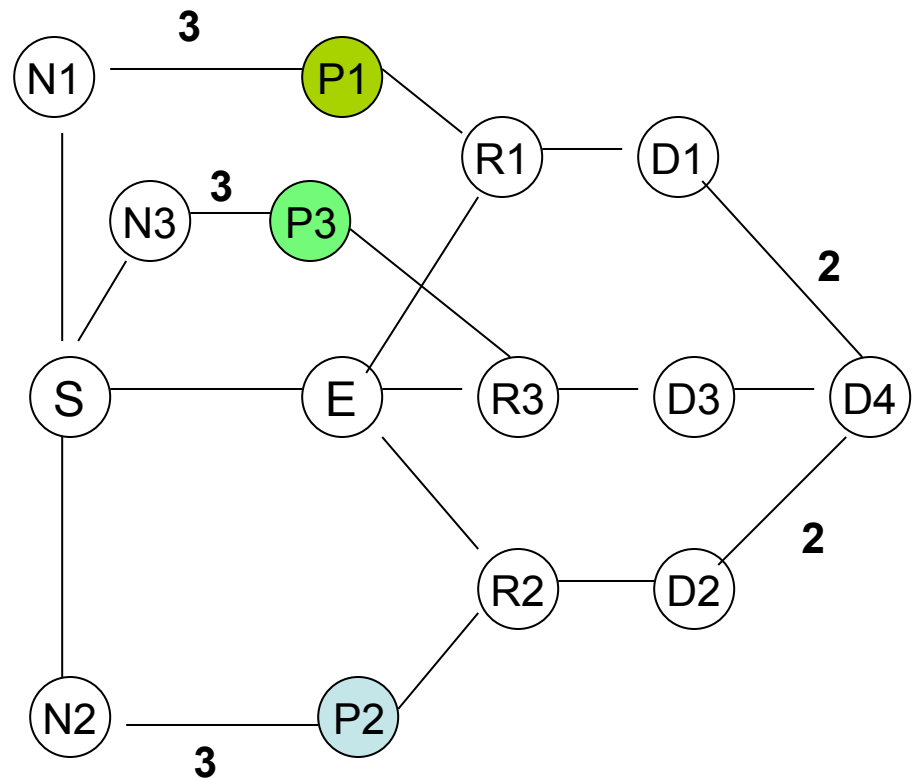
# Changing the algorithm

- Our proposal :
  - Compute NP-PQ space per NNHOP in addition
- NNHOP would provide a guaranteed node protection PQ space



# Changing the algorithm

- S has 3 NNHOPs for S-E link failure
- Computed PQ spaces :
  - NP-PQ for R1 : P1
  - NP-PQ for R2 : P2
  - NP-PQ for R3 : P3
  - LP-PQ for E : P3
- Destinations reachable through R1 would inherit NP-PQ in R1 space ...
- If a destination has no NP-PQ, it would fallback to LP-PQ



# Extra computation ?

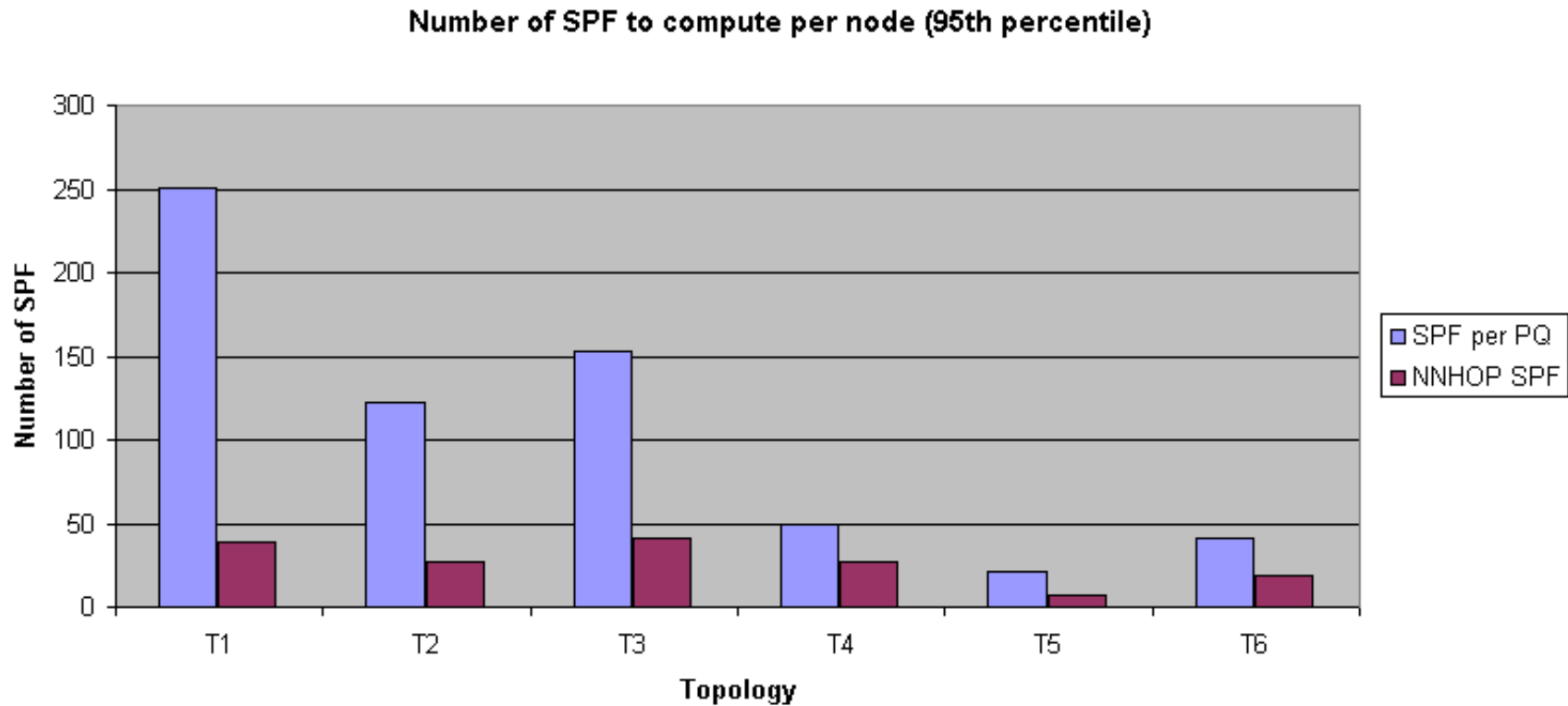
- NP-rLFA is adding extra computation : one rSPF per NNHOP
- Important fact :
  - Time to establish protection is not as important as convergence time (no traffic impact) : converge first then compute protection
  - Some existing mechanism (TE-FRR) may already take some seconds to establish protection
- Tradeoff between path/level of protection optimality and time to establish protection is needed

# Extra computation ?

- Simulation on some of our networks shows that number of SPF is acceptable :

Nb NNH per router	T1	T2	T3	T4	T5	T6
Min	1	1	2	1	2	1
Average	20,4135	9,47580	15,7227	13,8823	4,2608	9,06976
Median	19	6	11	15	4	6
95th Percentile	39	27	41	26,5	7	19
Max	107	35	53	30	8	22

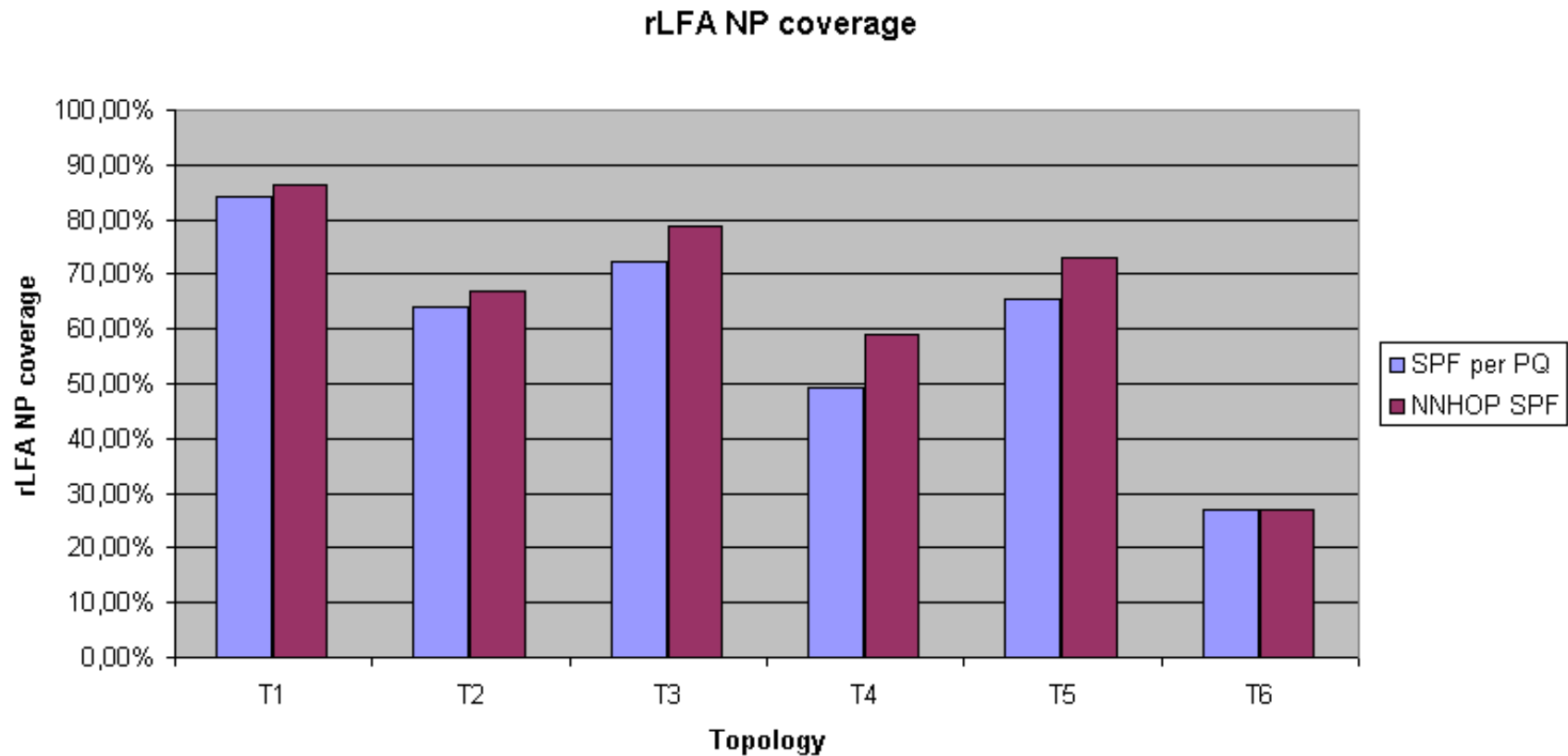
# Compared to SPF per PQ



*Considering always compute PQ*



# Compared to SPF per PQ



# Conclusion

- Proposal is providing guaranteed node protection for rLFA
- Extra rSPF needed but may be acceptable :
  - tradeoff between path optimality and time to compute protection
- More optimal than computing NP state of existing PQ space :
  - less computation (number of PQs may be very high)
  - expecting better NP coverage (even still not optimal)
- Request WG adoption