MSR6 WG – Why and How?

IETF114 Philadelphia
v1.1 - 07/25/2022

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How do we specify MSR6 solutions in the IETF

• Assume there is enough support to work on MSR solutions
  • because native IPv6 could use better multicast
  • Or whichever use-case spurs your interest to collaborate/contribute!

• There would surely be already a single IETF WG that we could just bring the work to, right?
  • There are already so many working groups, just pick the right one!
Well... almost.

Routing work in IETF is ... distributed!

- **PCE**: Owns BGP protocol that would require extensions for many MSR6 for many use-cases.
- **IDR**: Owns BGP protocol.
- **TEAS**: Key protocol option for signaling between PCE and network infrastructure.
- **ROLL**: Protocol / Solution group for LLN with RPL routing protocol and stateless IPv6 unicast routing headers.
- **SPRING**: Solution group for MPLS and IPv6 Segment Routing with stateless (unicast) IPv6 routing header.
- **6MAN**: Owner of IPv6 headers including routing headers.
- **V6OPS**: IPv6 (unicast) network operations group.
- **BABEL**: Unclear if they have use-case interest.
- **MANET**: Novel large scale data-center IGP for MSR6 DCN use-cases.
- **RIFT**: Novel large scale data-center IGP for MSR6 DCN use-cases.
- **LSVR**: Novel large scale data-center IGP for MSR6 DCN use-cases.
- **LSR**: Owns ISIS/OSPF IGP protocols that would require extensions for MSR6 for many use-cases.
- **MBONED**: Any multicast network operations group. Some protocols (AMT).
- **V6OPS**: IPv6 (unicast) network operations group. No multicast expertise.
- **DETTNET**: Stateless L2/L2.5 multicast solutions group.
- **PII**: (Stateful) multicast routing/host protocol specs including MLD.
- **BIER**: Protocol / Solution group for LLN with RPL routing protocol and stateless IPv6 unicast routing headers.
- **LATNET**: Latency, no-loss, throughput, jitter guarantees working group.
- **No multicast expertise**
- **TEAS**: Some multicast expertise.
- **SPRING**: No multicast expertise.
- **6MAN**: Some protocols (AMT).
- **TEAS**: Traffic-engineering architecture. Some multicast expertise.
So you want to boil the ocean planet IETF?

Important! No, we do not. This is how

1. Determine list of candidate deployable solution
2. Select Top “Minimum Viable Solution(s)” (MVS)
   • Best use-case solution that can be first specified / deployed:
     • Low complexity, big deployment gain
     • Determine functional specifications required to implement/deploy MVS
       (not only MSR6 drafts, but also dependencies, e.g: 6MAN, LSR)
     • Prioritize contributor cycles accordingly
3. Constrain MSR6 arch/solution documents scope based on MVS, so they can be ready together with functional spec
   • There are always “–bis” RFCs. arch/solution aspects beyond MVS can go into –bis, so we focus work on solution documents REQUIRED for MVS.
   • NOT rocket science.
     • Just good WG / charter / milestone stewardship.
     • Learned / exercised from, e.g. : ROLL, SPRING, BIER for example!.
       • Also, what not to try (e.g.: break RFC8200).
Example – If MVS was MSR6 BE for native IPv6 ISPs because (arguable) BIER MVS was stateless multicast (MVPN) for MPLS SP networks

• Well limited / plannable spec work
• IDR/LSR/(PIM): Ideally share/reuse, else adjust/improve work from BIER/MPLS solution
• Select best initial MRH (Multicast Routing Header) for BE (simulations, PoC implementation), spec in 6MAN
• MSR6: spec minimum use-cases, architecture, YANG spec, ? Pass over to responsible W when minimum quality met ?!
• Support / align with SPRING (terminology, architecture)
  • But ensure native IPv6, non-SRv6 SP networks are also equally well supported (see next slide)
• Additional reality check with V6OPS
SP -> DCN: Build once, sell twice ?!!

- MSR6 MVS for SP should be easily adoptable to DCN
- Many (especially newer) DCN built for native IPv6 (not L2 or MPLS)
  - SRv6/SRH less necessary for TE (FlowLabel because of ECMP etc.).
  - SRv6 may just rely on Destination Address SID semantics without SRH.
- E.g.: Stateless multicast can scale/simplify in-DCN multicast/broadcast for (thousands of) virtual LANs between VMs

- Additional work for MSR6 in DCN ?
  - Analyze use-case specifics:
  - Extend MSR6 MVR to additional IGP (RIFT, LSVR)
  - Biggest step (to scale): MSR6 into the Host (e.g.: KVM, ESXI).
    - May not require MSR6 architecture/spec changes when you have routing in the host!
    - But good new spec work if DCN hosts are not routers.
    - And need to revisit MRH option for DCN scalability (O(larger) number of Hosts than SP/PE).