MSR6 WG – Why and How ?

IETF114 Philadelphia

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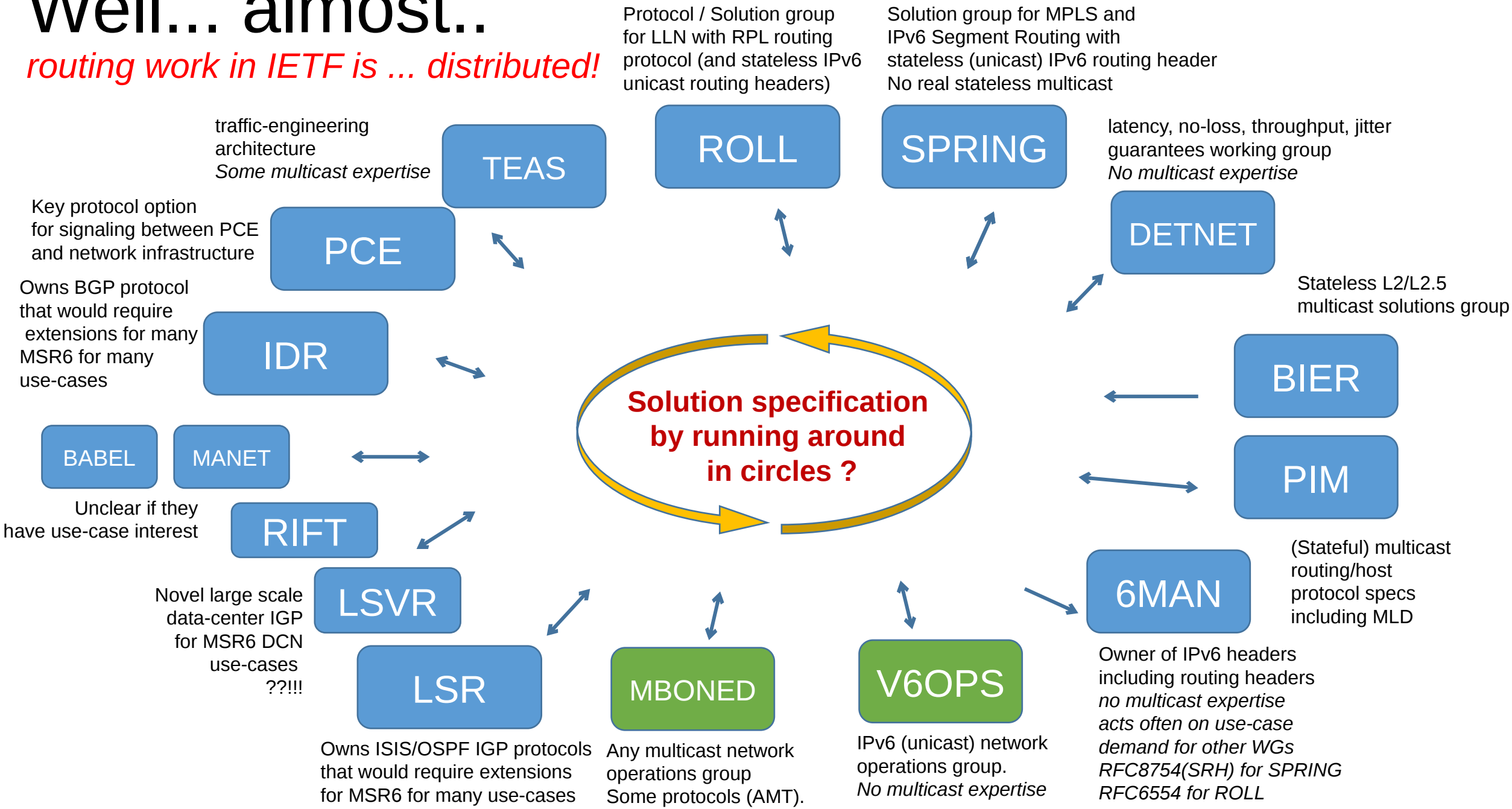
How do we specify MSR6 solutions in the IETF

- 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!

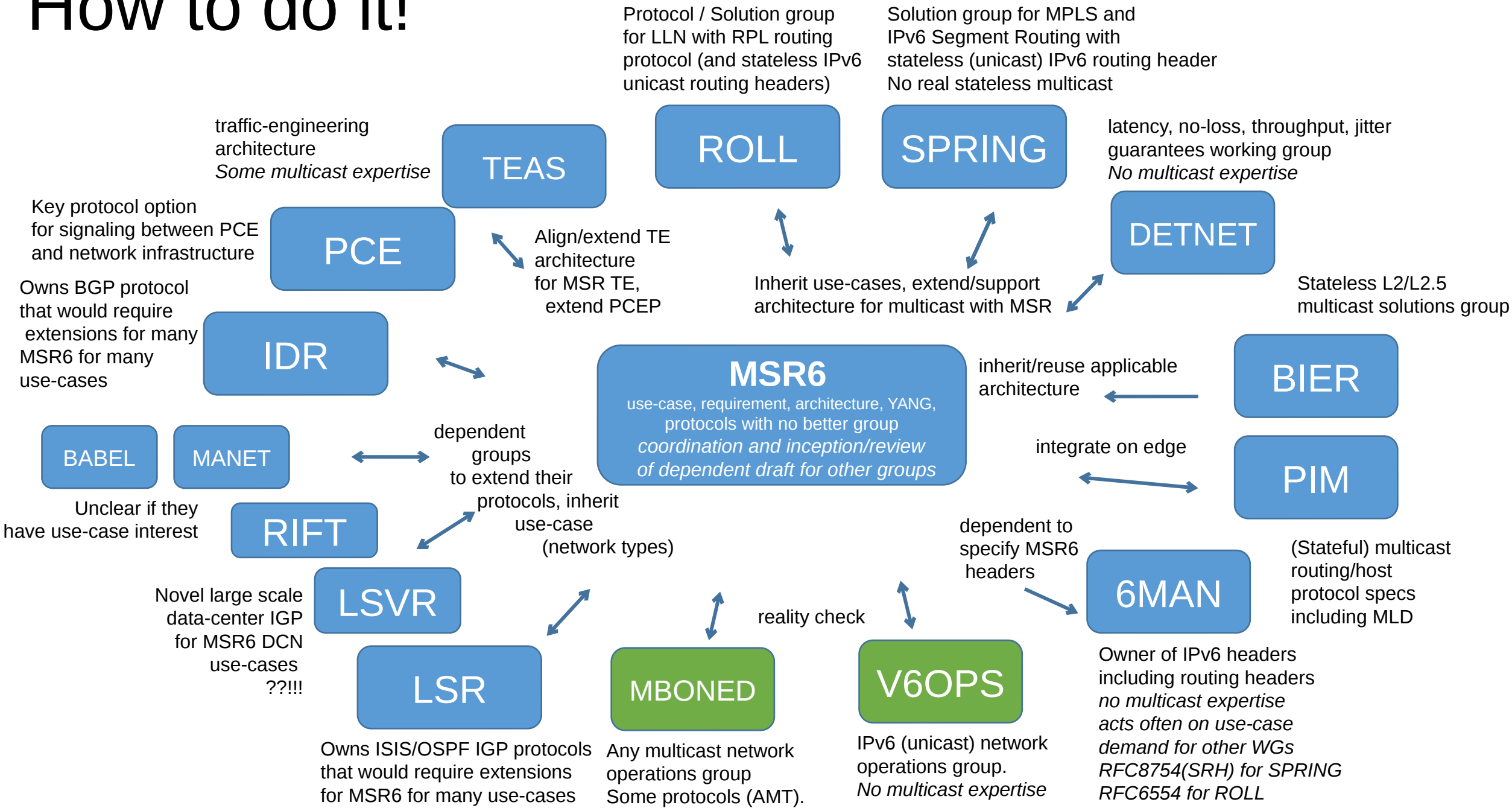
- There would surely be already a single IETF WG that we could just bring the work to, right ?
  - There are already so many working groups, just pick the right one!

Well... almost..

routing work in IETF is ... distributed!



How to do it!


Protocol / Solution group for LLN with RPL routing protocol (and stateless IPv6 unicast routing headers)
Solution group for MPLS and IPv6 Segment Routing with stateless (unicast) IPv6 routing header No real stateless multicast
traffic-engineering architecture
Some multicast expertise
TEAS
ROLL
SPRING
latency, no-loss, throughput, jitter guarantees working group
No multicast expertise
Key protocol option for signaling between PCE and network infrastructure
PCE
Align/extend TE architecture for MSR TE, extend PCEP
DETNET
Inherit use-cases, extend/support architecture for multicast with MSR
Stateless L2/L2.5 multicast solutions group
Owns BGP protocol that would require extensions for many MSR6 for many use-cases
IDR
MSR6
use-case, requirement, architecture, YANG, protocols with no better group
coordination and inception/review of dependent draft for other groups
inherit/reuse applicable architecture
BIER
BABEL
MANET
dependent groups to extend their protocols, inherit use-case (network types)
integrate on edge
PIM
Unclear if they have use-case interest
RIFT
dependent to specify MSR6 headers
6MAN
(Stateful) multicast routing/host protocol specs including MLD
Novel large scale data-center IGP for MSR6 DCN use-cases ??!!!
LSVR
reality check
LSR
MBONED
V6OPS
Owner of IPv6 headers including routing headers
no multicast expertise
acts often on use-case demand for other WGs
RFC8754(SRH) for SPRING
RFC6554 for ROLL
Owns ISIS/OSPF IGP protocols that would require extensions for MSR6 for many use-cases
Any multicast network operations group
Some protocols (AMT).
IPv6 (unicast) network operations group.
No multicast expertise

So you want to boil the ~~ocean~~ ~~planet~~ IETF ?

Important ! No, we do not. This is how

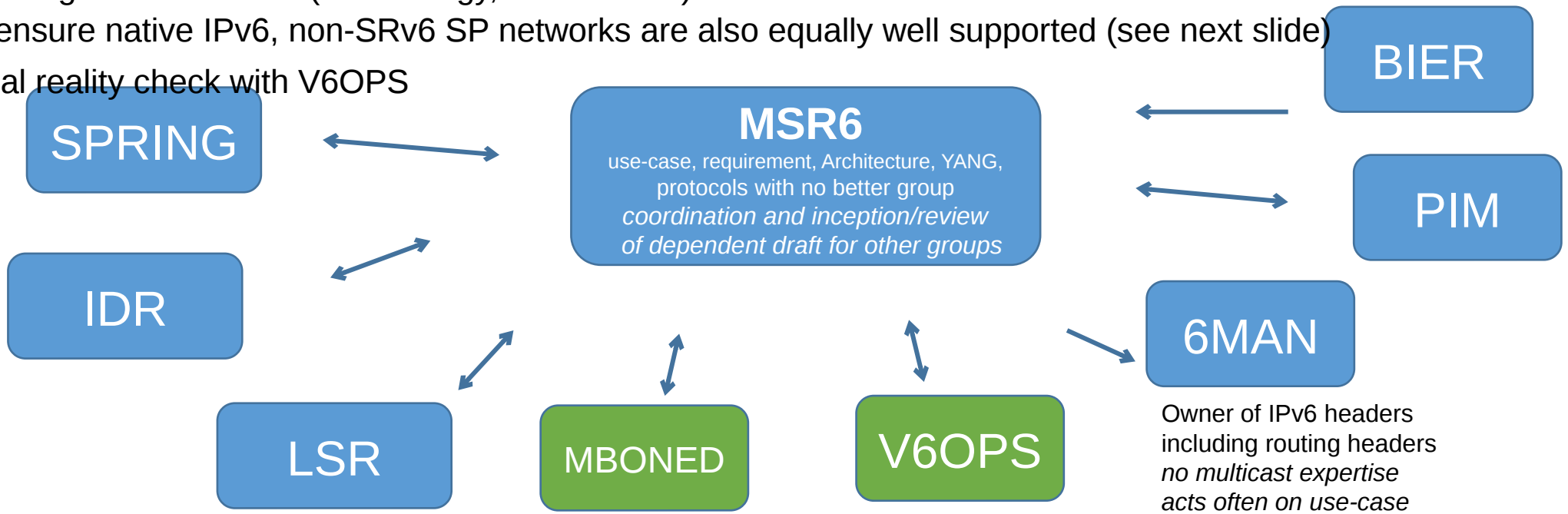
1. Determine list of candidate deployable solution
2. Select Top “Minimum Viable Solution(s)” (MVS)
   - Best use-case solution that can be first specified / deployed:
   - Low complexity, big deployment gain
   - Determine functional specifications required to implement/deploy MVS (not only MSR6 drafts, 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



Owner of IPv6 headers including routing headers
no multicast expertise
acts often on use-case demand for other WGs
RFC8754(SRH) for SPRING
RFC6554 for ROLL

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).