MSR6 WG – Why and How ?

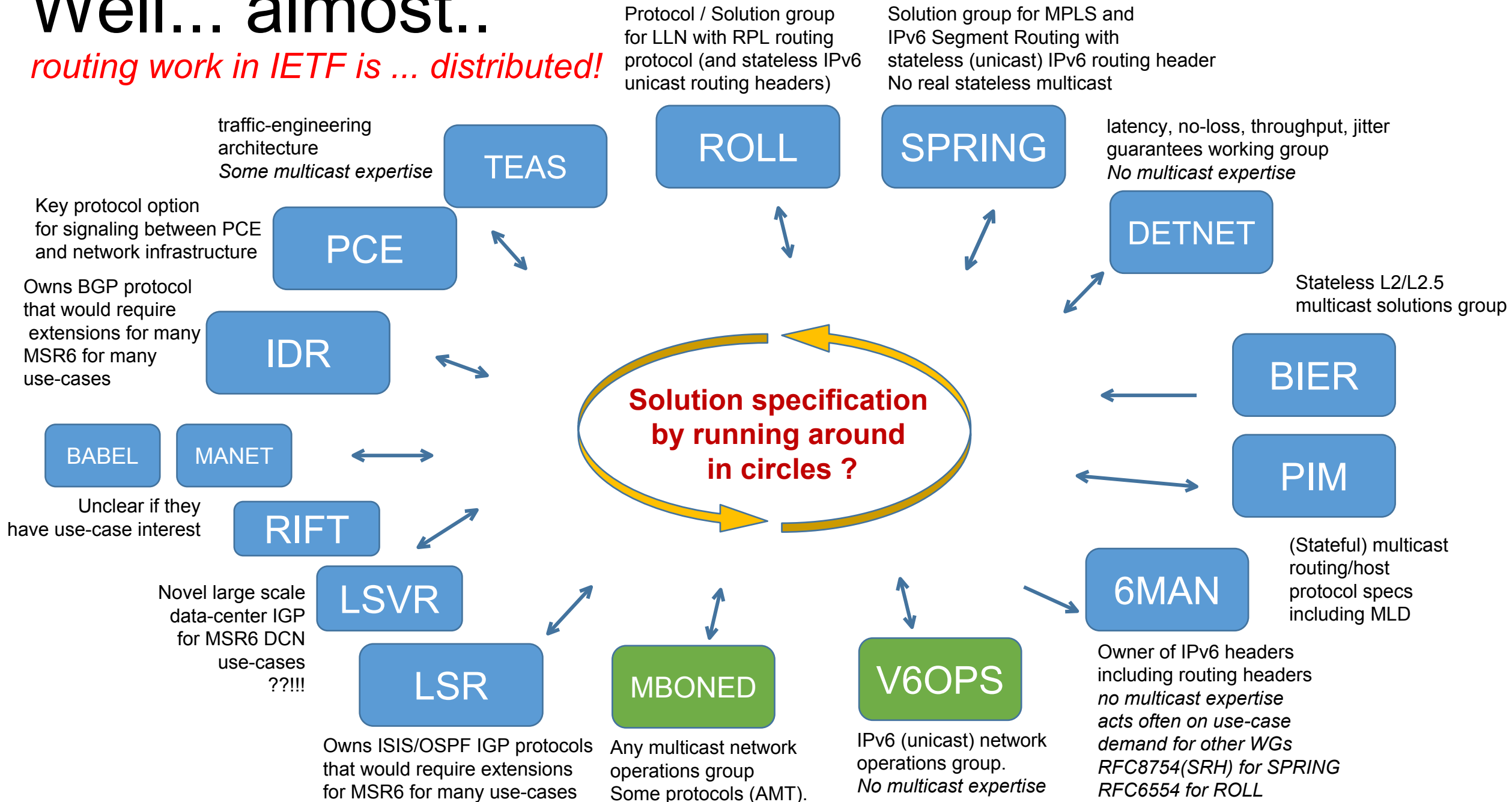## IETF114 Philadelphia
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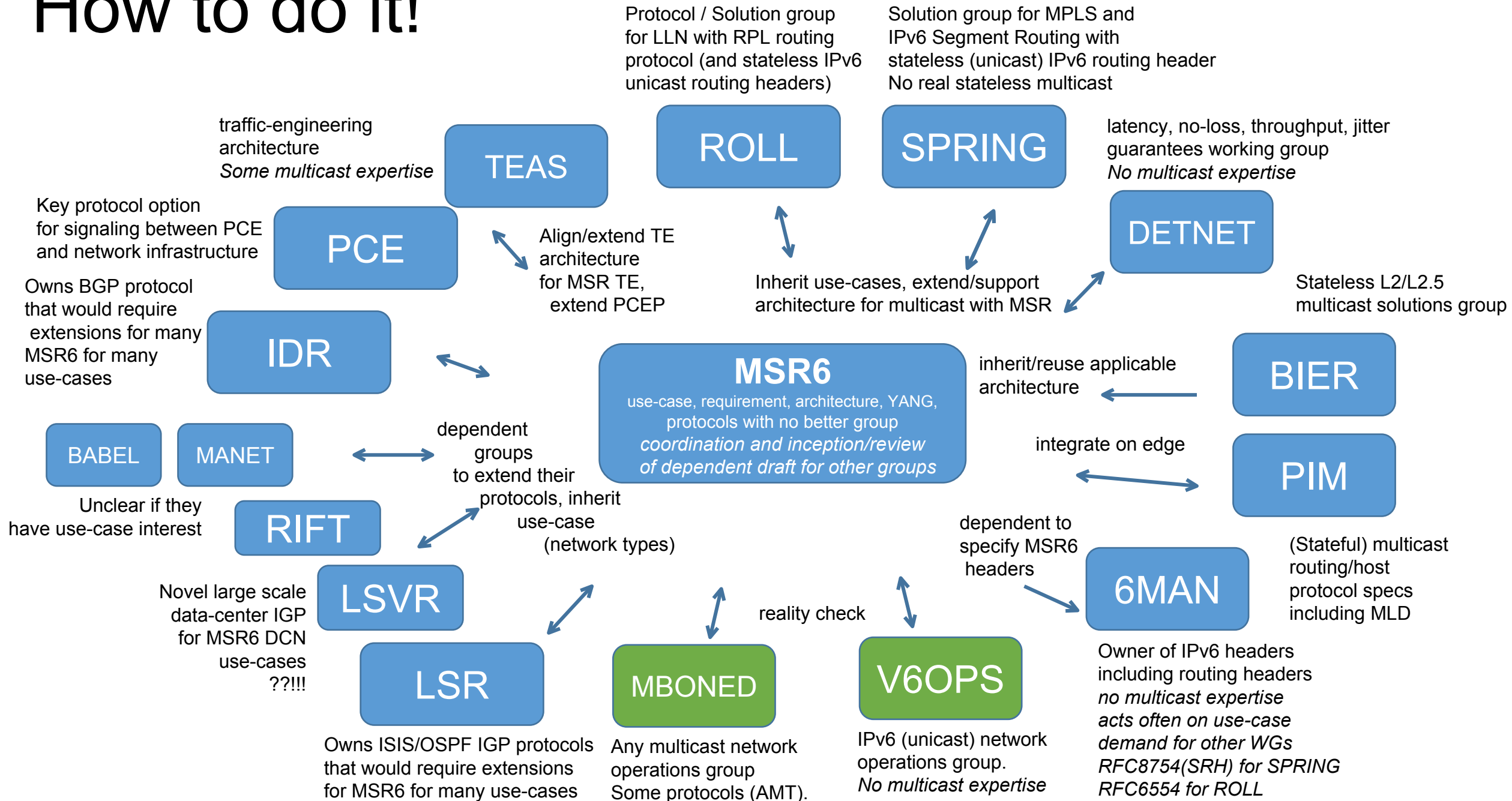# How do we specify MSR6 solutions
in the IETF

- 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..

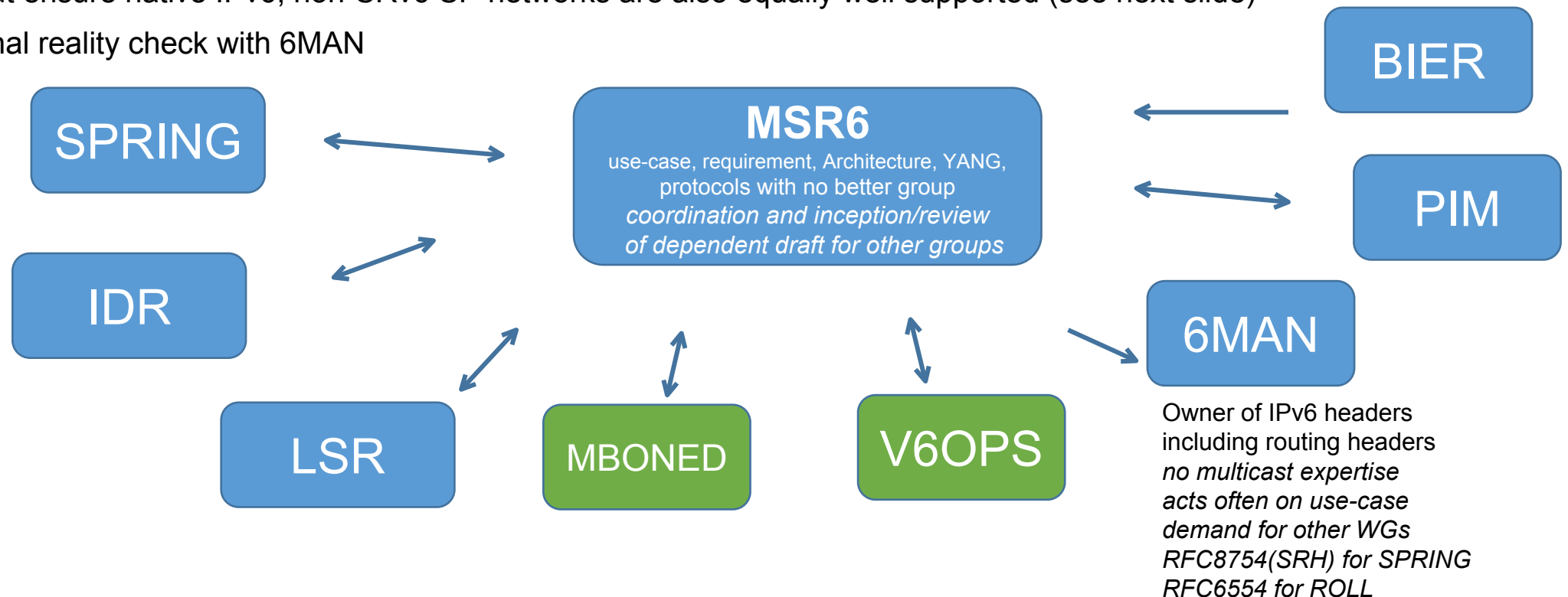*routing work in IETF is ... distributed!*

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

DETNET

Stateless L2/L2.5 multicast solutions group

Owns BGP protocol that would require extensions for many MSR6 for many use-cases

IDR

BIER

Solution specification by running around in circles ?

BABEL **MANET**

PIM

Unclear if they have use-case interest

RIFT

(Stateful) multicast routing/host protocol specs including MLD

Novel large scale data-center IGP for MSR6 DCN use-cases ??!!!

LSVR

6MAN

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

How to do it!

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Key protocol option for signaling between PCE and network infrastructure

PCE

Align/extend TE architecture for MSR TE, extend PCEP

DETNET

Owns BGP protocol that would require extensions for many MSR6 for many use-cases

IDR

Inherit use-cases, extend/support architecture for multicast with MSR

Stateless L2/L2.5 multicast solutions group

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

(Stateful) multicast routing/host protocol specs including MLD

Novel large scale data-center IGP for MSR6 DCN use-cases ??!!!

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reality check

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

- Thank you for raising IETF std. concern #1
  - No tongue in cheek. This IS important!

- No! There already is enough global warming ;-(

1. Determine list of candidate deployable solution

2. Select Top "Minimum Viable Solution(s)" (MVS) – low complexity, big deployment gain
   - Determine functional specifications required to implement/deploy MVS
     (not necessarily MSR6 drafts only, but e.g.: 6MAN, LSR)
   - Prioritize contributor cycles accordingly

3. Constrain MSR6 solution documents scope based on MVS, so they can be ready
   together with functional spec
   - There are always –bis RFCs. And those could be started in parallel (individually) to track future work.
     They just will not be given WG adoption/cycles/review until it's their time to be worked on
     (serialization!) (many WGs have such work hanging individually for years to ensure MVS work is
     prioritized).
   - If need be (AD concerns about boiling): Constrain charter to MVS, expand later.

- This is NOT rocket science. Just good WG / solution stewardship.
  - Yes, IETF is best at "small" incremental work,
    but we have learned how to grow solutions that way (ROLL, SPRING, BIER for example!).

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, ? early inception of drafts for the other WG (pass over) ?

- 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 6MAN

BIER

PIM

SPRING

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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)
  - Mostly not using SRv6 ?
  - SRv6 Not needed for MSR6 if we specify appropriately !
- E.g.: Stateless multicast can scale/simplify in-DCN multicast/broadcast for (thousands of) virtual LANs between VMs

- Additional work for MSR6 ?
  - 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).