

CFP: 34841

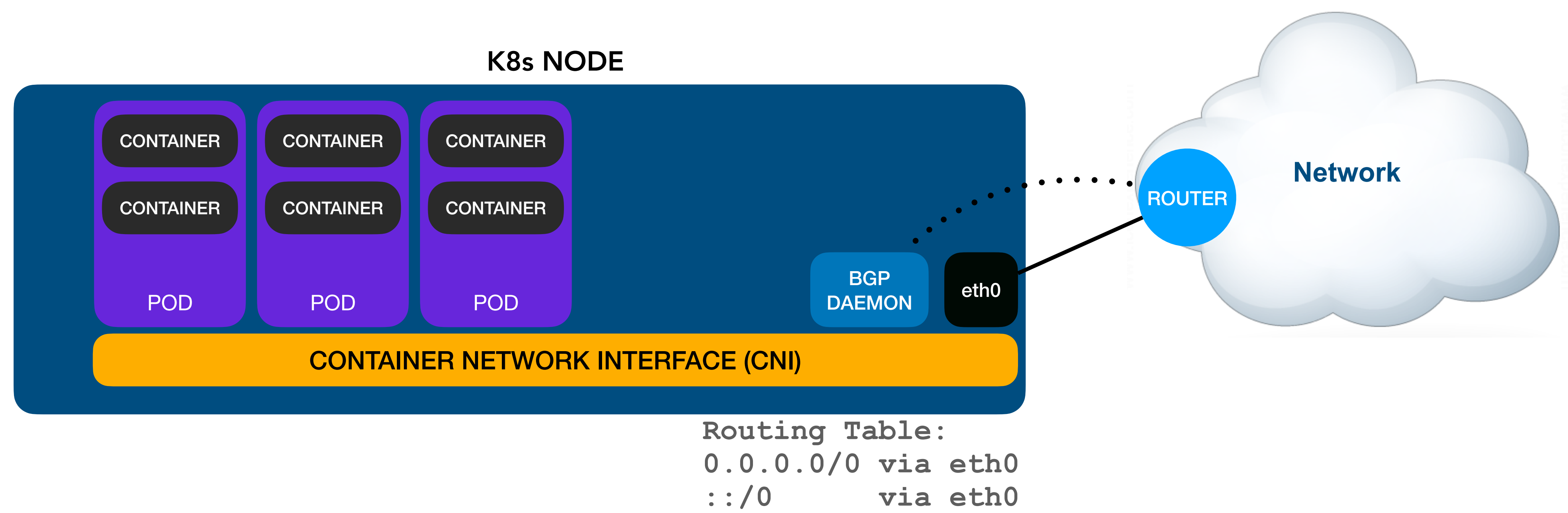
BGP Route Learning

<https://github.com/cilium/design-cfps/pull/58>

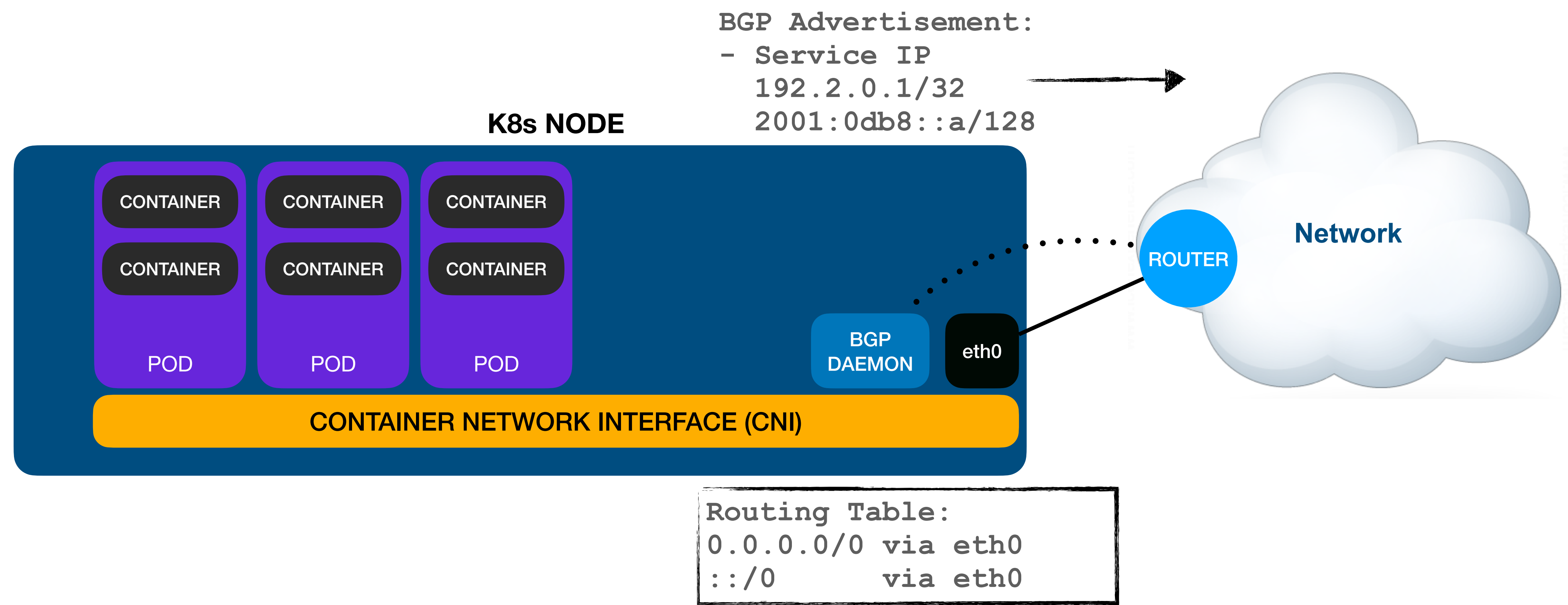
David Swafford, Principal Engineer
CoreWeave

Cilium Developer's Summit on 11/10/2024

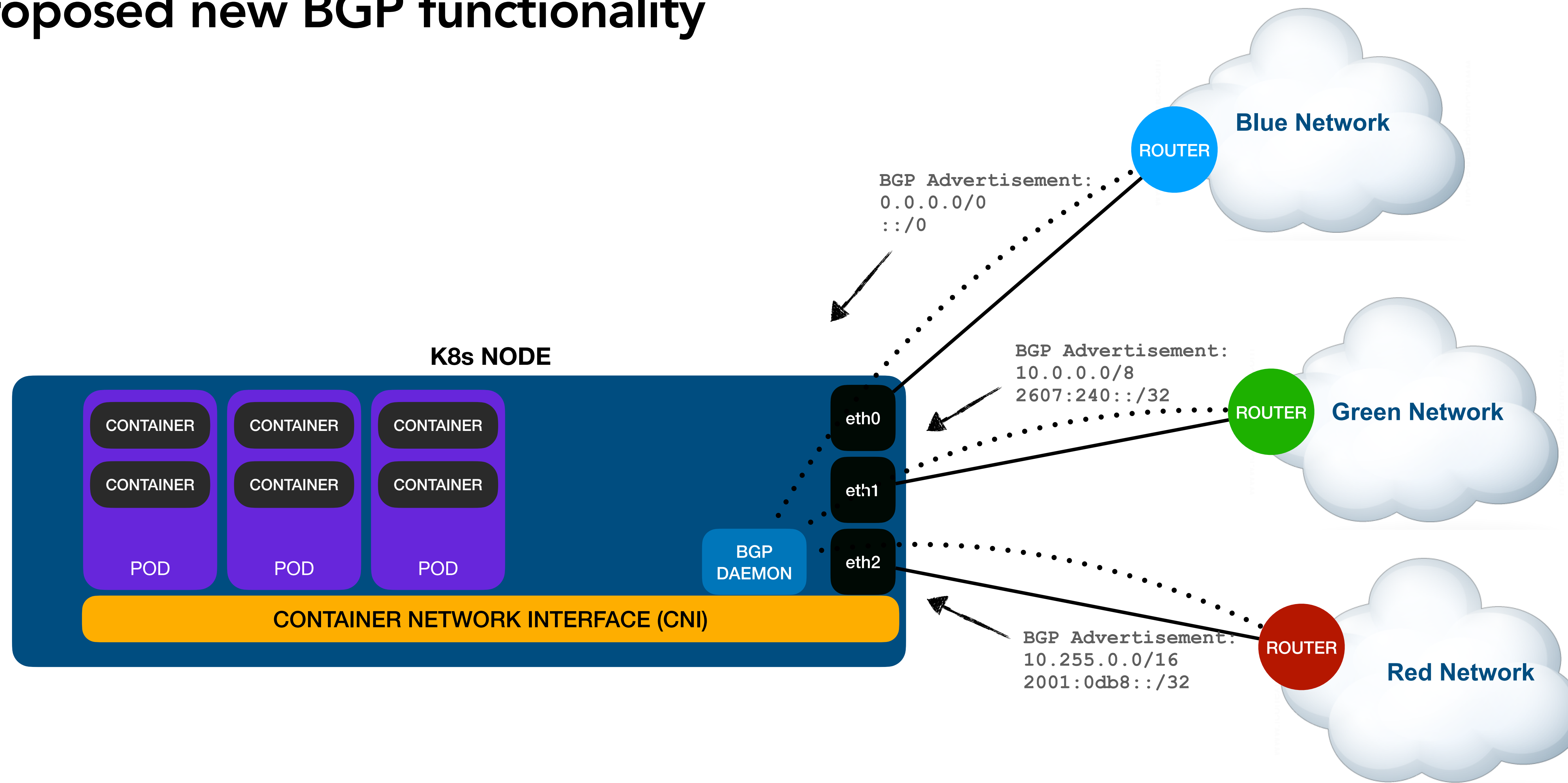
Cilium's current BGP functionality



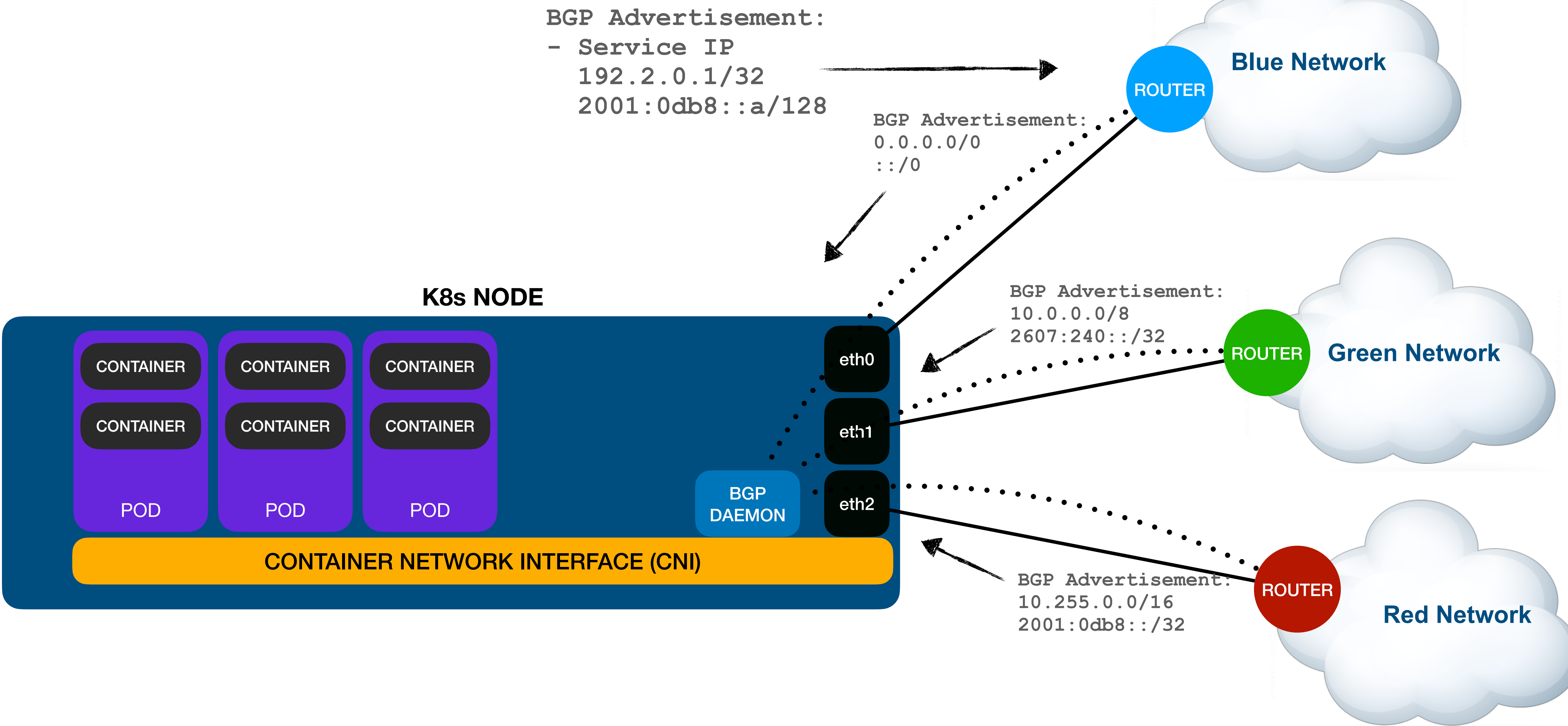
Cilium's current BGP functionality



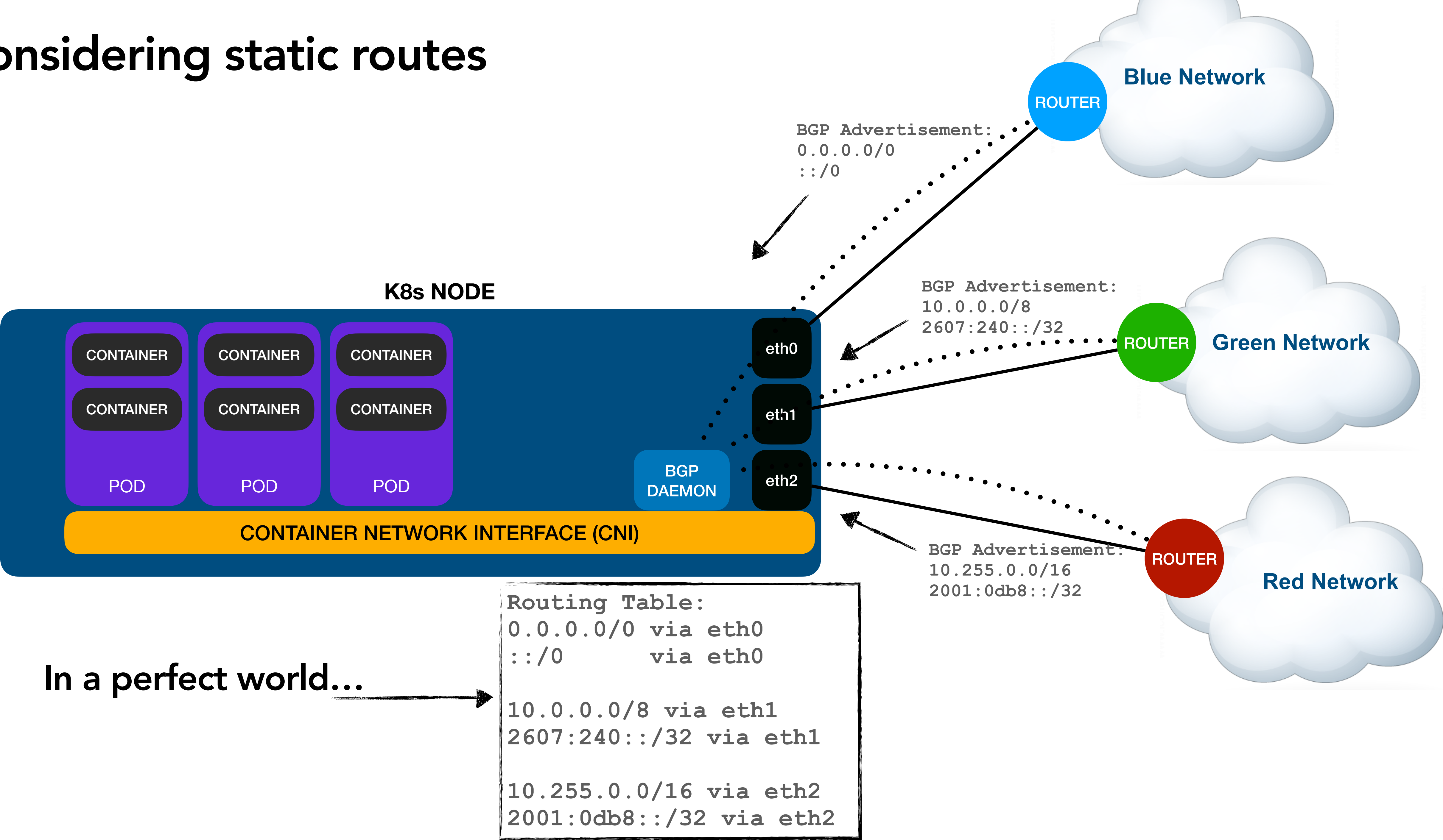
Proposed new BGP functionality



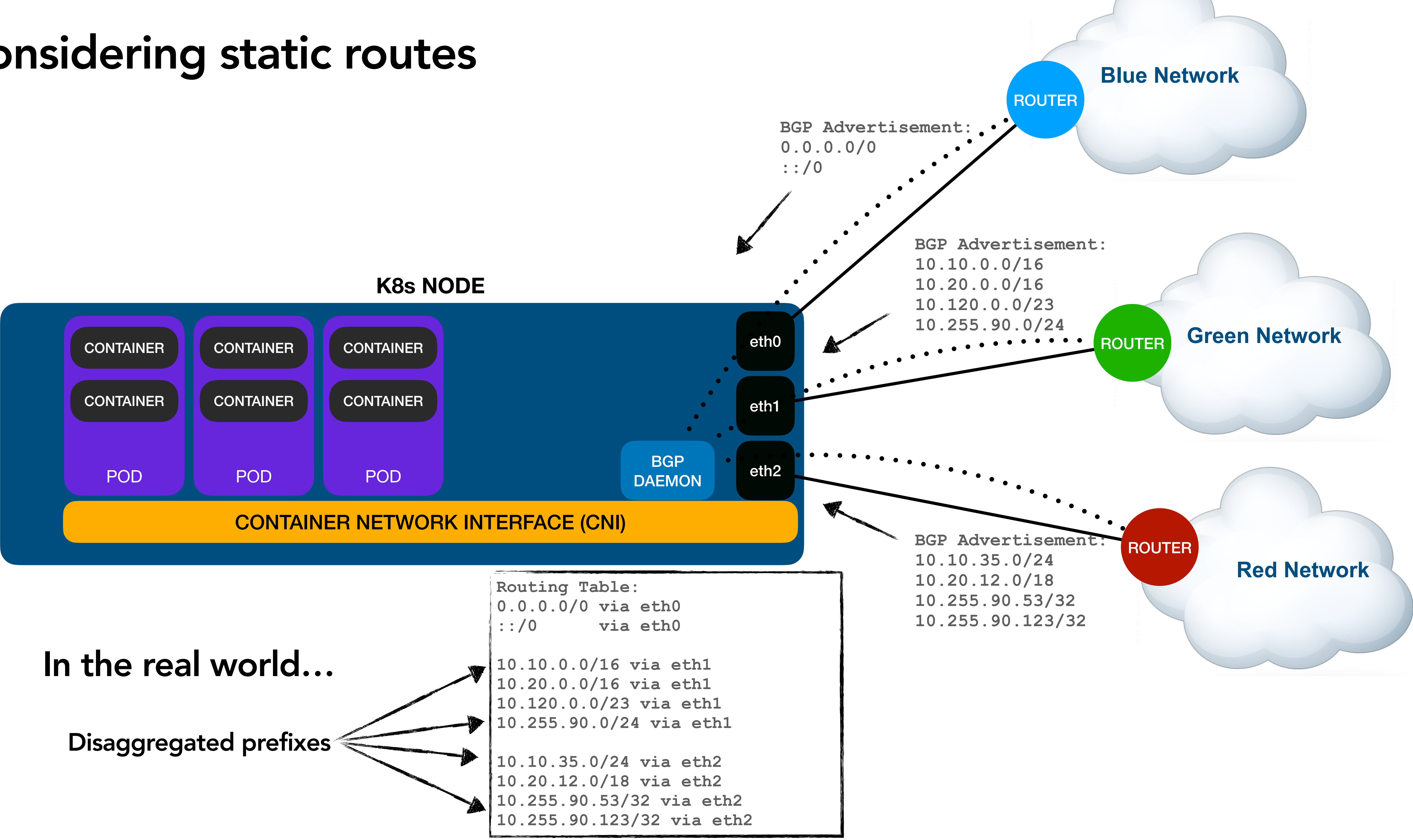
Proposed new BGP functionality



Considering static routes



Considering static routes



Problem Statement

Cilium's Border Gateway Protocol implementation is one-directional today. Its intended use is for the advertisement of pod and service IP addresses/prefixes to the network. The network however is unable to influence Cilium's routing decisions using BGP or by any other means.

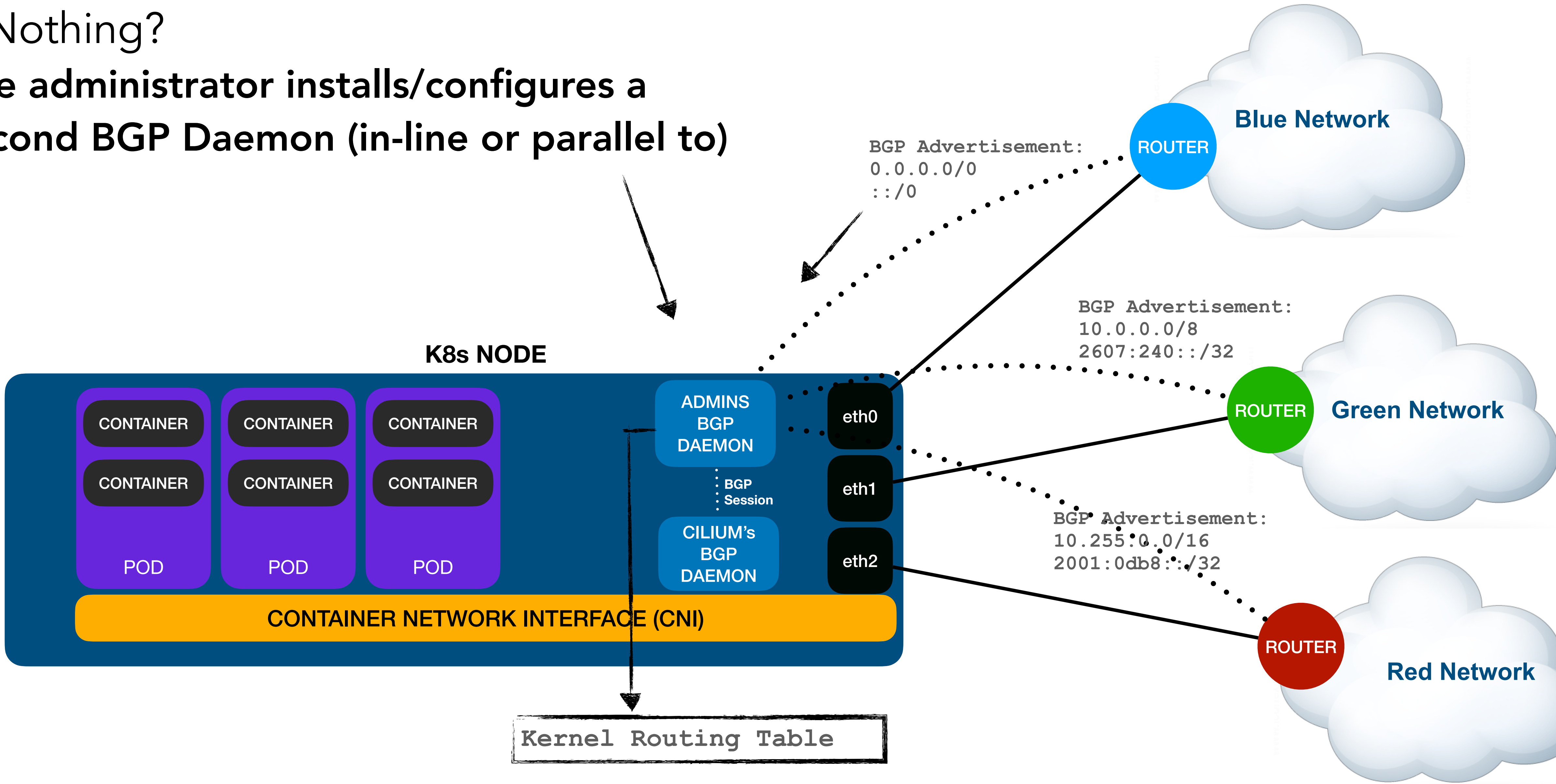
In advanced network designs, the administrator may desire to establish connectivity between Cilium and several isolated routing domains. Isolated routing domains may not have contiguous address space.

Today, in Native Routing Mode, this is possible using static routes. In large environments, static routes are a significant burden.

CFP's Prior Discussion

Do Nothing?

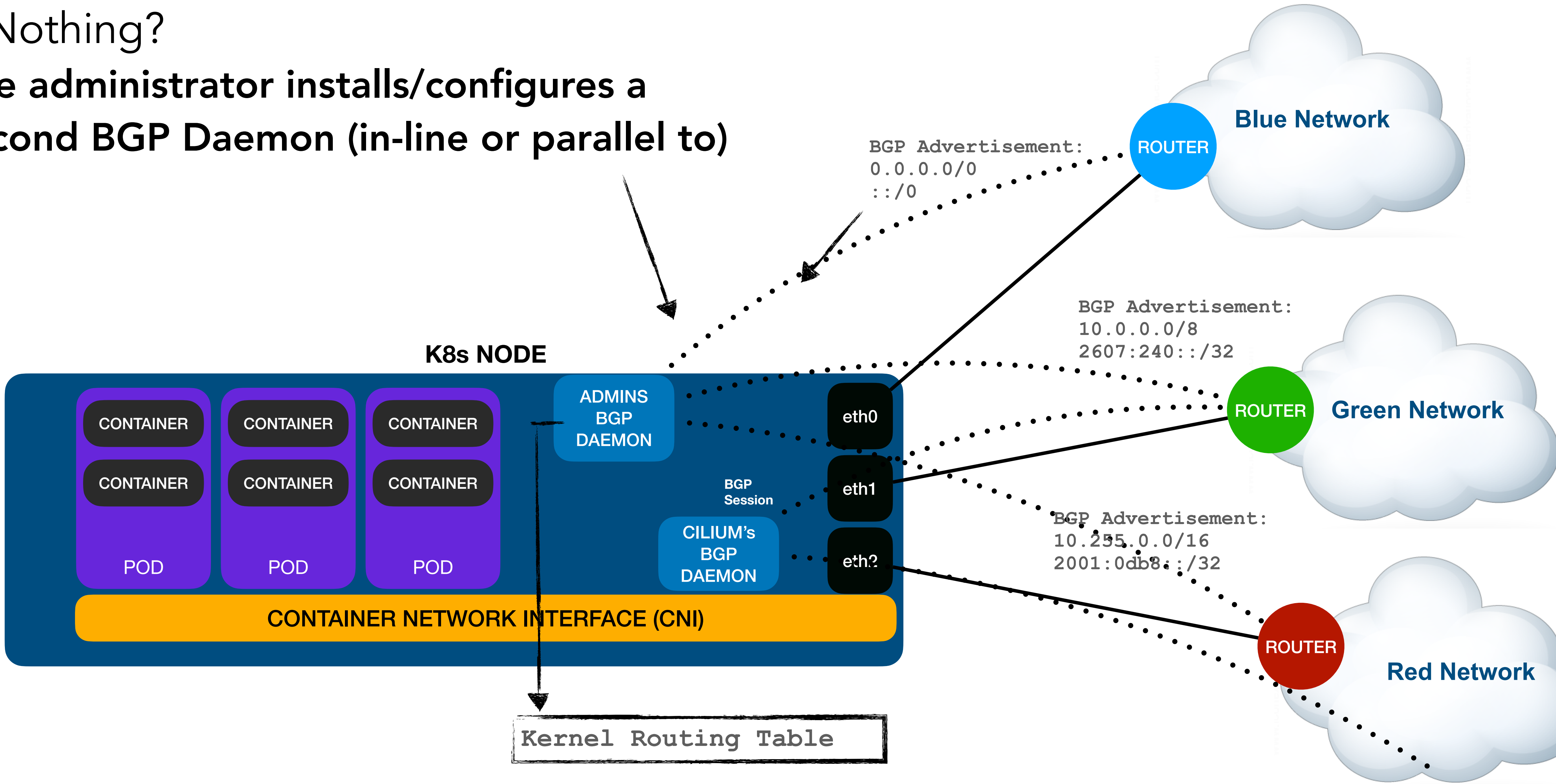
- The administrator installs/configures a second BGP Daemon (in-line or parallel to)



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CFP's Prior Discussion

As a Cilium Feature:

Deploying Zebra beside GoBGP for RIB programming

See <https://github.com/osrg/gobgp/blob/master/docs/sources/zebra.md>

Extending GoBGP to natively handle RIB programming

Making the Dataplane aware (eBPF route programming)

Proposal

Extend Cilium to support route learning via BGP

- Routes learned via BGP to be accepted and programmed in the Kernel routing table and/or eBPF routing table
- cilium-agent to be extended to implement a BGP RIB
 - (custom-developed, not an off-the-shelf daemon)
- Optionally, Dataplane extended to support route programming (routing decisions directly in eBPF).
- Cilium Open Source to natively support multiple network connections. Described in (<https://isovalent.com/blog/post/isovalent-enterprise-for-cilium-1-14-multi-network/>) as an Enterprise-only feature.