**Network Plumbing Working Group Agenda**

Meeting link (changed permanently 4/3/2023):

<https://meet.jit.si/K8sNetworkPlumbingWG>

TIME: **09:30 EST/13:30 GMT** every other Thursday opposite SIG Network

Meeting is also on SIG Network calendar

Google Group

<https://groups.google.com/forum/#!forum/network-plumbing-working-group>

[network-plumbing-working-group@googlegroups.com](mailto:network-plumbing-working-group@googlegroups.com)

[Slack invite link](https://join.slack.com/t/npwg-team/shared_invite/zt-1jbjvuwv6-VGQ5ekezOyxT3_zXef89ow) [Nov 7 2022]

When suggesting topics and agenda items for an upcoming meeting please make sure to include your name in the suggestion.

v1.2 CRD Spec (approved December 2020):

<https://docs.google.com/document/d/1Ny03h6IDVy_e_vmElOqR7UdTPAG_RNydhVE1Kx54kFQ/edit>

A reference Implementation:

<https://github.com/intel/multus-cni/>

Governance Document:

[https://docs.google.com/There is a weekly meeting to identify Nokia impacting bugs - that team should know the use case.](https://docs.google.com/document/d/1lIWOK-W6fb1VZiSjO1BoFUs0TmoVwgd4XuVc6mtJk2c/edit#heading=h.5x0d5h95i329)

[document/d/1lIWOK-W6fb1VZiSjO1BoFUs0TmoVwgd4XuVc6mtJk2c/edit#heading=h.5x0d5h95i329](https://docs.google.com/document/d/1lIWOK-W6fb1VZiSjO1BoFUs0TmoVwgd4XuVc6mtJk2c/edit#heading=h.5x0d5h95i329)

Additional Technical Discussion meeting (alternative Tuesday, 10:30AM, EST)

<https://docs.google.com/document/d/129FUXBHvKMOVwsvjgYzZX4CorsN_uJwHTdo8DXs1Tpk/edit#>

2019 Goal Setting:

<https://docs.google.com/document/d/1bf_6j0jZbSMPH5LQJ9DZmAjn5DhP9B_YPJs70tiu-iU/edit#>

V2 Considerations Document [for reference]:group

<https://docs.google.com/document/d/1grqQ4Twqn0gnt2QraM-HVctT4HdyJgtZ-gqiGThCgaM/edit#>

Accelerator Support for SRIOV Network Operator

<https://github.com/k8snetworkplumbingwg/sriov-network-operator/issues/197>

## Apr 20, 2023

Note: Meeting URL is changed!: <https://meet.jit.si/K8sNetworkPlumbingWG>

## **Attendees:**

* Regular business
  + Membership candidates
  + Maintainer candidates!
  + Project candidates
* Agenda

## Apr 6, 2023

Note: Meeting URL is changed!: <https://meet.jit.si/K8sNetworkPlumbingWG>

## **Attendees:** Tomofumi Hayashi (Red Hat), Joseph Richard (Red Hat), Ivan Kolodiazhnyi (NVIDIA), Eoghan Russell (Intel), Nikhil Simha (Red Hat), Niamh Hennigan (Intel), Marcelo Guerrero Viveros (Red Hat)

* Regular business
  + Membership candidates
  + Maintainer candidates!
  + Project candidates
* Agenda

## Mar 23, 2023

## **Attendees:** Doug Smith (Red Hat), Eoghan Russell (Intel), Tomofumi Hayashi (Red Hat), Marcelo Guerrero Viveros (Red Hat), Peter White (Microsoft)

* Regular business
  + Membership candidates
  + Maintainer candidates!
  + Project candidates
* Agenda
  + We should fix slack invites so they're permanent
    - <https://github.com/k8snetworkplumbingwg/multus-cni#contact-us>
  + <https://join.slack.com/t/npwg-team/shared_invite/zt-1rqx69qqt-8pO4llsZmbwaVOOd4EQuDg>

## 

## Mar 9, 2023

## **Attendees:** Doug Smith (Red Hat), Philipp Riederer (genesis cloud), Joseph Richard (Red Hat), Tomofumi Hayashi (Red Hat), Eoghan Russell (Intel), Ivan Kolodiazhnyi (NVIDIA), Leonardo Milleri (Red Hat)

* Regular business
  + Membership candidates
  + Maintainer candidates!
  + Project candidates
* Agenda
  + [Doug/Philipp] Follow up on Whereabouts ip domains  
    <https://github.com/k8snetworkplumbingwg/whereabouts/pull/258>
    - Decided to use the original strategy, using the generated names.
    - We've approved and merged!
    - Migration tool may be optional / not necessary without api change
    - Moving forward with #256, I'll try to recruit Miguel's help for review
    - Make any changes to proposal if necessary in #256 after a rebase
  + [Doug/Tomo] K8s native network object
    - Name: "podnetwork"
    - We'll use a CRD before it's a core object.
      * Just for design phase.
    - Schedule being discussed, a roadmap with some targets
      * <https://docs.google.com/presentation/d/12uVQHtbJXS-x8GJcAgqlDLURvsn7_zFj2KWNhkwEDXg/edit#slide=id.p>
    - Looking to further coordinate with CNI and CNI maintainers as the effort moves forward so that we keep this common ground for the ecosystem, and figure out implementation concerns from a CNI perspective.
    - Current discussion is API-design focused, but as it evolves we'll need to look at the implementation-specific concerns.
  + [Tomo] Several dependabot alerts
    - Please check ‘security’ tab in repo's you're responsible for and see whether the repo has alerts or not (e.g. <https://github.com/k8snetworkplumbingwg/network-attachment-definition-client/security/dependabot>)
      * golang.org/x/net
      * golang.org/x/text
      * k8s.io/kubernetes
    - Any way to automate merges? Possibly with GH actions.

## Feb 23, 2023

## **Call cancelled for Feb 23! No one is available to chair the call. See you all on March 8th! Thanks.**

## **Attendees:**

* Regular business
  + Membership candidates
  + Maintainer candidates!
  + Project candidates
* Agenda
  + [Doug/Philipp] Follow up on Whereabouts ip domains  
    <https://github.com/k8snetworkplumbingwg/whereabouts/pull/258>

## Feb 9, 2023

## **Attendees:** Muhammad Adil Ghaffar(Ericsson), Leonardo Milleri (Red Hat), Ivan Kolodiazhnyi (NVIDIA), Marcin Mirecki(Red Hat), Tomofumi Hayashi (Red Hat), Marcelo Guerrero (Red Hat), Niamh Hennigan (Intel), Peter White (Microsoft)

* Regular business
  + Membership candidates
  + Maintainer candidates!
  + Project candidates
* Agenda
  + [Adil Ghaffar from Ericsson] Backport ipv6 validation in whereabouts repo:

<https://github.com/k8snetworkplumbingwg/whereabouts/issues/299>

* [tomo] K8s Native multi-networking updates
  + Poll for object name: <https://forms.gle/hW94SaMSyNi6hnUb6>

## Jan 26, 2023

## **Attendees:** Doug Smith (Red Hat), Ivan Kolodiazhnyi (NVIDIA), Eoghan Russell (Intel), Leonardo Milleri (Red Hat), Marcin Mirecki (Red Hat), Tomofumi Hayashi (Red Hat),Sebastian Scheinkman (Red Hat), Niamh Hennigan (Intel), Abdallah Chatila (Kaloom), Joseph Richard (Red Hat), Peter White (Microsoft), Ken Young (Red Hat), Miguel Duarte (Red Hat),

* Regular business
  + Membership candidates
  + Maintainer candidates!
  + Project candidates
* Agenda
  + [Alexander M from Nvidia] New ib-sriov-cni release: <https://github.com/k8snetworkplumbingwg/ib-sriov-cni/issues/69>
    - <https://docs.google.com/document/d/1sJQMHbxZdeYJPgAWK1aSt6yzZ4K_8es7woVIrwinVwI/edit#heading=h.a169lfuz7mbq>
    - Doug sent Mosehele a slack message, and get in touch with me next meeting if the tag hasn't happened.
  + [Doug/Tomo] Changed permissions so anonymous users can't suggest
    - <https://docs.google.com/document/d/1Ny03h6IDVy_e_vmElOqR7UdTPAG_RNydhVE1Kx54kFQ/edit>
    - Any members that would like edit access, just ask and we'll add you
    - Now has request that users make a PR to the spec repo.
  + [Doug/{others?}] K8s Native Multinetworking updates
    - Naming object discussion
      * Poll coming up for naming choice
    - Next steps: object parameters.

## Jan 12, 2023

## **Attendees:** Ayush Patel (Samsung), Eoghan Russell (Intel), Philipp Riederer (genesis cloud), Doug Smith (RH), Leonardo Milleri (RedHat), Peter White (Microsoft), Sebastian Scheinkman (RH), William Zhao (RH), Tomofumi Hayashi(RH)

* Regular business
  + Membership candidates
  + Maintainer candidates!
  + Project candidates
* Agenda
  + [Doug, to Nvidia] Do we need a Multus v3 branch tag after merging to v3 branch?
    - <https://github.com/k8snetworkplumbingwg/multus-cni/pull/996/files>
      * Need clarification on not using v1.4.0 but a specific commitish?
    - This is complete.
  + [Doug/Tomo] Propose changing permissions for spec document
    - Too many comments / edits without benefit.
    - Would prefer github issues, etc.
    - Would give edit access to anyone
    - Add header to the doc asking for issue creation on GH
  + [Tomo] Member list in repo
    - Will ask owners to double check soon:
      * Expired member request in repo(i.e. invite {admin,write,read} role, but invite mail is not clicked): 3
      * Empty repo (>=1y): 1
    - Q: should CI account be READ role, WRITE role or ADMIN role?
      * Is this the dummy account we use for vendor Jenkins jobs?
      * What CI accounts are currently there?
        + npwg-robot
        + kubevirt-bot
        + mellanox-ci
  + [Doug/Philipp] Follow up on Whereabouts ip domains  
    <https://github.com/k8snetworkplumbingwg/whereabouts/pull/258>
    - Current state of the discussion: The backwards-compatible way is the better one (See PR #256)
      * Doug owes a finalization for the design to represent this decision
  + [Doug] Kubernetes native multi-networking
    - <https://github.com/kubernetes/enhancements/pull/3700/files>  
      [KEP: Multi-Network Requirements](https://docs.google.com/document/d/1ztx9TOQ9Hiyj9PG9aPv6jyDLhe_FB7haV_yjJIcb-0Y/edit?usp=sharing&authuser=1)
    - No name for the Object yet
    - Phases
      * Phase I use cases
      * Phase II definition of the Object
      * Phase III integration

## 

## Dec 29th, 2022

## **Canceled, happy New Year!**

## Dec 15, 2022

## **Attendees:** Joseph Richard (Red Hat), Ivan Kolodiazhnyi (NVIDIA), Aneesh Puttur (Red Hat), Doug Smith (RH), Tomofumi Hayashi(Red Hat), Niamh Hennigan (Intel),

* Regular business
  + Cancel next meeting? (Dec 29th)
  + Membership candidates
  + Maintainer candidates!
  + Project candidates
* Agenda
  + [Doug] K8s Native Multinetworking phase 1 final comments due by this Friday
    - <https://docs.google.com/document/d/1ztx9TOQ9Hiyj9PG9aPv6jyDLhe_FB7haV_yjJIcb-0Y/edit?usp=sharing&authuser=1>
  + [Doug] Device-info-spec pod annotation missing in network-status when using the "plugins" field in the NAD's CNI Spec
    - <https://github.com/k8snetworkplumbingwg/multus-cni/issues/973>
    - Only happens when more than one plugin is used in a NAD
    - Steps to reproduce are provided
    - Probably need an SR-IOV expert on this one.
  + [Yury/Ivan] update DeviceInfo spec to 1.1.0 pending PRs
    - <https://github.com/k8snetworkplumbingwg/multus-cni/pull/984> - update network-attach-definition client to 1.4.0 in mulmellanox-citus
    - <https://github.com/k8snetworkplumbingwg/multus-cni/pull/996> - update network-attach-definition for multus v3
  + [Doug/Philipp] Follow up on Whereabouts ip domains  
    <https://github.com/k8snetworkplumbingwg/whereabouts/pull/258>
    - How to deal with users that currently are deliberately using the same range multiple times (but with different names, the names have no effect currently)?
    - Next steps: Doug second pass review, Miguel to review.
    - The implementation is in <https://github.com/k8snetworkplumbingwg/whereabouts/pull/256>

## 

## Dec 1, 2022

## **Attendees:** Joseph Richard (Red Hat), Philipp Riederer (genesis cloud), Eoghan Lawless (Intel), Leonardo Milleri (Red Hat), Tomofumi Hayashi (Red Hat), William Zhao (Red Hat),Sebastian Scheinkman (Red Hat), Abdallah Chatila (Kaloom), Niamh Hennigan (Intel), Peter White (Microsoft), Adrian Chiris(Nvidia), Ivan Kolodiazhnyi (NVIDIA), Doug Smith (Red Hat), Aneesh Puttur (Red Hat) Per Andersson (Kaloom)

* Regular business
  + Membership candidates
    - Per Andersson (Kaloom)
      * Accepted!
  + Maintainer candidates
    - Miguel Duarte de Mora Barroso – CNI Log
      * Accepted!
  + Project candidates
* Agenda
  + [Doug/Philipp] Follow up on Whereabouts ip domains  
    <https://github.com/k8snetworkplumbingwg/whereabouts/pull/258>
    - Problem: Backwards compatibility / API breaking change! (Idea: Write a tool that renames any existing IPPools, perhaps as an extra container that can be run as a job?)
    - Next steps: Add migration job idea to proposal, review PR.
  + [Tomo] Is there current maintainer list for each repo?
    - CODEOWNERS per repo ?
    - Whereabouts: <https://github.com/k8snetworkplumbingwg/whereabouts/blob/master/.github/CODEOWNERS>
    - Multus dynamic networks: <https://github.com/k8snetworkplumbingwg/multus-dynamic-networks-controller/blob/main/.github/CODEOWNERS>
    - In community repo ? (or per project ?)
      * <https://github.com/k8snetworkplumbingwg/community/blob/master/MAINTAINERS.md>
    - Vote to give Tomo admin privileges to the k8snetworkplumbingwg github namespace for the purposes of creating these lists.
      * No no votes.
  + [adrianc] adding device-representor to device-info-spec merged !
    - Next step to define field in network-attachment-def client
      * <https://github.com/k8snetworkplumbingwg/network-attachment-definition-client/pull/49>
        + Review welcome
    - After merge, can we do a release ?
      * Next step is to bump this version in multus to support exposing this field in network-status
        + Can we do it in both multus 3.x and master ?

Yes, we should.

Two PRs it is.

After which we would do a minor release for multus 3.x will be done.

* + - CNI which supports new field:
      * <https://github.com/k8snetworkplumbingwg/accelerated-bridge-cni/pull/53>
  + K8s Native Multinetworking
    - KEP Document: [KEP: Multi-Network Requirements](https://docs.google.com/document/d/1ztx9TOQ9Hiyj9PG9aPv6jyDLhe_FB7haV_yjJIcb-0Y/edit?usp=sharing&authuser=1)
  + Switch this document to be pageless?
    - Go for it

## Nov 17, 2022

## **Attendees:** Adrian Chiris(Nvidia), Eoghan Lawless (Intel), Philipp Riederer (genesis cloud), Ayush Patel (Samsung), Joseph Richard (Red Hat), Andrea Panattoni (Red Hat), Nikhil Simha (Red Hat), Sebastian Scheinkman (Red Hat), Doug Smith (Nvidia), Miguel Duarte (Red Hat), Niamh Hennigan (Intel), Jack Ding (Red Hat), Ken Young (Red Hat), Leonardo Milleri (Red Hat), Abdallah Chatila (Kaloom), Peter White (Microsoft) Aneesh Puttur (Red Hat)

* Regular business
  + Membership candidates
    - Joseph Richard (Red Hat) - josephdrichard
    - Ken Young (Red Hat) - kenyis
    - Aneesh Puttur (Red Hat) -aneeshkp
    - [Leonardo Milleri](mailto:lmilleri@redhat.com)(Red Hat) - lmilleri
    - Jack Ding (Red Hat) - jzding
    - Per Andersson (Kaloom)
  + Maintainer candidates
    - [SebaSch] Promote Andrea (<https://github.com/zeeke>) as a maintainer for the following projects:
      * Sriov-network-operator
      * Sriov-network-device-plugin
      * Sriov-cni
    - Niamh (Intel) nhennigan
      * Sriov-network-operator
      * Sriov-network-device-plugin
      * Sriov-cni
    - Andrea got already the approval from the K8s Network & Resource Management WG[K8s NPWG network & resource mgnt projects Agenda](https://docs.google.com/document/d/1sJQMHbxZdeYJPgAWK1aSt6yzZ4K_8es7woVIrwinVwI/edit#)
    - [eoghan1232] Any volunteer maintainers for CNI-Log
      * <https://github.com/k8snetworkplumbingwg/cni-log>
  + Project proposals
    - [Nikhil] [Overarching CI for NPWG](https://docs.google.com/document/d/1XEQ9SwJLdlGMruSBO8AVyzRokr4Q-i4kD9RIGjNxdMU/edit) (wip proposal)
      * Runs on a schedule to check for interdependencies between projects in the NPWG.
      * Recently also heard for a further kind of tests for reference CNI plugins in a chain, along with Multus.
* Agenda
  + Philipp Riederer <priederer@genesiscloud.com>: <https://github.com/k8snetworkplumbingwg/whereabouts/pull/258>  
    Allow to have the same IP Range in multiple networks by changing the name of the IPPools away from being (only) derived from their CIDR.
    - Use case originally from a multitentant cluster.
      * IP addresses are not re-allocated among tenants.
    - Really strikes a chord with Doug for what Per mentions often, "IP domains"
    - Big thanks from Miguel and Doug on proposing a "hack" (<https://github.com/k8snetworkplumbingwg/whereabouts/pull/256>, a creative PR to work with what's there!) to get the conversation running
      * The idea was to add a "name" construct, and munge together a ippools name with a combo of "name" and "ip range"
    - Our current API doesn't account for multi tenancy
      * Miguel looking for improvements to the API, instead of building on top of what might be
        + Opportunity for making positive changes to the API
      * This would be a breaking change
      * Might need to consider a migration path for data structures
    - Might need a "well known name" for networks where we don't have one specified, e.g. "default" if you don't specify a kind of "ip domains"
      * Pool could be in the same namespace as the net-attach-def.
    - Action: Doug (and anyone else) to review and discuss at the next call
      * Take another look at PR #257!
    - Question: Does it work w/o Multus?
      * But – reconciliation doesn't work without
      * TODO: File an issue about reconciler usage without Net-attach-defs.
      * TODO: Philipp will update the proposal for context outside of net attach def
      * *Note after the meeting: The discussed dependency on the NetworkAttachmentDefinitions name is wrong. The CNI configuration itself already has a field “name” and that will also be there when multus is not in use. ~~Philipp*
  + [Ivan] LGTM.com will be shut down in December 2022
    - <https://github.blog/2022-08-15-the-next-step-for-lgtm-com-github-code-scanning/>
    - Miguel - does this PR address these concerns ? <https://github.com/k8snetworkplumbingwg/whereabouts/pull/281>
    - [eoghan1232] CodeQL
      * <https://github.com/k8snetworkplumbingwg/sriov-network-operator/pull/375>
      * Do we want to integrate CodeQL to all repos? LGTM is EOL.
      * This would be a good static tool for open source
      * Sounds like it makes sense to move forward with these!
      * Up to each project as usual
  + [Ayush21298] Update License in files ?
    - Should we add NOTICE too ?
    - <https://github.com/k8snetworkplumbingwg/multus-cni/pull/947>
    - Looks like this is required per "the interwebs"
      * We should add it!!
      * …Bummer that github doesn't prepopulate with it.
      * Name: k8snetworkplumbinggroup
  + [Ayush21298] Discuss <https://github.com/k8snetworkplumbingwg/whereabouts/issues/279>
  + [adrianc] kind reminder for review: <https://github.com/k8snetworkplumbingwg/device-info-spec/pull/3>
    - Add “device-representor” to device info spec
      * Leonardo Milleri will give it a round of review and if OK we can proceed with merge

## Nov 3, 2022

## **Attendees:** Doug Smith (Red Hat), Nikhil Simha (Red Hat), Ayush Patel (Samsung), Miguel Duarte Barroso (Red Hat), Aneesh Puttur (Red Hat), Joseph Richard (Red Hat), MIchael Cambria (Red Hat), Abdallah Chatila (Kaloom), Peter White (Microsoft), Jack Ding (Red Hat), Ken Young (Red Hat) Per Andersson (Kaloom)

* Regular business
  + Membership candidates
    - \*Ayush Patel (Samsung)
      * Approved!
  + Maintainer candidates
  + Project proposals
    - [Miguel] adding pod network interface hotplug
      * Depends on multus-v4 (thick-plugin)
      * <https://github.com/maiqueb/multus-dynamic-networks-controller>
      * CRI-O / containerd runtimes
      * Proposed maintainer's
        + Miguel Duarte Barroso
        + Abdallah Chatila
      * Approved.
* Agenda
  + Philipp Riederer <priederer@genesiscloud.com>: <https://github.com/k8snetworkplumbingwg/whereabouts/pull/258>  
    Allow to have the same IP Range in multiple networks by changing the name of the IPPools away from being (only) derived from their CIDR.
    - Bumped to next call.
  + [Ivan] LGTM.com will be shut down in December 2022
    - <https://github.blog/2022-08-15-the-next-step-for-lgtm-com-github-code-scanning/>
    - Bumped to next call.
  + [Doug/Miguel] Missing section 1.1.5
    - Original Text
      * *1.1.5 Replacement of the Kubernetes Cluster-Wide Default Network*
      * *To preserve compatibility and expectations with existing Kubernetes deployments, this specification does not attempt to change any of the existing Kubernetes cluster-wide network behavior. All pods must still be attached to the cluster-wide default network as they are today.*
      * [From version 1.0 markdown](https://github.com/k8snetworkplumbingwg/multi-net-spec/blob/master/v1.0/%5Bv1%5D%20Kubernetes%20Network%20Custom%20Resource%20Definition%20De-facto%20Standard.md)
    - Additionally: Does the "default-network" annotation for Multus which allows you to select a default network break the spec?
    - Doug's take – I think this is missing. This is a fundamental part of the spec, and it should be there.
    - **TODO: Doug to re-add and propose it be re-added.**
  + [Miguel] interface hotplug - edit the `network-status` annotation vs adding a new annotation for “dynamically-attached” interfaces ? (using the same format as network status).
    - Next step: Propose a change and we'll review.
    - Currently, the spec was designed to not preclude this functionality for dynamic attachments. As we progress, maybe we need to specify these further. Options include expanding upon the current annotation, or further adding another one. Currently, people think of this as kind of CNI ADD result, but it's apt to grow from there, and should be revisited.
      * Also, let's further define semantically how this is expected to work (CNI result, or current state, for example)
  + [Ayush21298] Whereabouts DualStack PR
    - Approved by Miguel
    - Can I be the feature maintainer ?
    - Amazing working model for the group! Great design discussion, proposal, and ultimate outcome. Thank you Ayush and Miguel!
  + [Ayush21298] Should we add git hooks ?
    - go fmt, go vet, basic tests if possible etc.
    - <https://github.com/k8snetworkplumbingwg/whereabouts/blob/master/.github/workflows/test.yml#L32>
    - <https://git-scm.com/book/en/v2/Customizing-Git-Git-Hooks>
      * Pre-commit hooks

## Oct 20, 2022 **Attendees:** Doug Smith (Red Hat), Nikhil Simha (Red Hat), Ayush Patel (Samsung), Leonardo Milleri (Red Hat), Ivan Kolodiazhnyi (NVIDIA), Miguel Duarte (Red Hat), Abdallah Chatila (Kaloom), Yury Kulazhenkov (NVIDIA), MIchael Cambria (Red Hat), Eoghan Lawless (Intel), Kevin Clarke (Intel),

* Regular business
  + Membership candidates
  + Maintainer candidates
  + Project proposals
* Agenda
  + [Doug] Alpha tag for Multus v4.0
    - Requested as part of kubevirt, to deploy a multus v4
    - Would give us some more community traction
    - Propose a release named v4.0.0-alpha
      * This tag would work for image tags
      * But, for vendor library inclusion – gopkg.in can only use vX.Y.Z with numerals
      * For kubevirt usage, this would initially only be for the image tag, doesn't need to be for vendor inclusion.
    - Would simplify our operator (which requires tagged releases)
      * <https://github.com/kubevirt/cluster-network-addons-operator/pull/1433>
    - Agreed to move forward. We'll plan to tag at the next maintainer's meeting next Thursday following
  + [Yury Kulazhenkov (NVIDIA)] NPWG device-info-spec update
    - New field “vf-representor-device” for PCI devices
    - <https://github.com/k8snetworkplumbingwg/device-info-spec/pull/3>
    - New spec version? 1.0.1? 1.1.0?
      * Recommend 1.1.0, minor version bump might clue people into that there's a
    - Related PR for accelerated-bridge-cni <https://github.com/k8snetworkplumbingwg/accelerated-bridge-cni/pull/53>
    - Follow up with include an update to the status annotation.
  + [Yury Kulazhenkov (NVIDIA)] accelerated-bridge-cni 0.4.0 release
    - <https://github.com/k8snetworkplumbingwg/accelerated-bridge-cni/issues/54>
    - Couple new features and preparing the 0.4.0 release
    - Keeping the issue up for a week for input, otherwise, ready to move forward with the new release.
  + [Yury Kulazhenkov (NVIDIA)] multi-networkpolicy-tc initial (0.1.0) release
    - <https://github.com/k8snetworkplumbingwg/multi-networkpolicy-tc/issues/44>
    - Also the same as above! Ready to roll, and includes improvements for testing.
  + [Doug] <https://github.com/k8snetworkplumbingwg/network-attachment-definition-client/pull/42>
    - Where do we stand?
    - Last time we spoke about this: **June 16th, 2022**
    - multus PR => <https://github.com/k8snetworkplumbingwg/multus-cni/pull/864>
      * (is this it ?..)
    - Tomo requesting change to 5.3.6.4 “default-route”
      * This should include language
      * Also the Multus README
    - Part of the complication here is that we need an evolution for CNI 2.0 (or whatever is next, including the k8s native network object spec/KEP)
    - Merged.
  + [Ivan] LGTM.com will be shut down in December 2022
    - <https://github.blog/2022-08-15-the-next-step-for-lgtm-com-github-code-scanning/>
  + [Ayush21298] DualStack for Whereabouts pull request
    - Rebased, squashed and comments addressed
    - Pending for review

## Oct 6, 2022

Temporally zoom URL today:

<https://us04web.zoom.us/j/79487349389?pwd=JaEtaq72gEW9e6mkbv2xrH7XZrKlAY.1>

**Attendees:** Tomofumi Hayashi (Red Hat), Ivan Kolodiazhnyi (NVIDIA), Eoghan Russell (Intel), Abdallah Chatila (Kaloom), Eoghan Lawless (Intel), Per Andersson (Kaloom), Niamh Hennigan (Intel)

* Regular business
  + Membership candidates
  + Maintainer candidates
  + Project proposals
* Agenda
  + [eogharu]
    - <https://github.com/k8snetworkplumbingwg/multus-cni/issues/918>
    - ‘:thick’ image tag is used for v3.9.x thick images mainly, but from master branch, we change ‘:latest-thick’ or ‘:stable-thick’ (not just ‘:thick’). In addition, thick image between v3.9.x and master are different and not compatible (because v4.x, we changed the architecture of thick plugin as ‘pure thick plugin’)’, hence ‘:thick’ image tag now contains ‘a bit older master thick’ images. To avoid this confusion, multus team thinking to invalidate ‘thick’ images from container registry and change deployment yaml of v3.9.x branch.

## Sept 22nd, 2022

**Attendees:** Doug Smith (Red Hat), Ayush Patel (Samsung), [Leonardo Milleri](mailto:lmilleri@redhat.com)(Red Hat), Tomofumi Hayashi (Red Hat), [Andrea Panattoni](mailto:apanatto@redhat.com) (Red Hat), Peter White (Microsoft)

* Regular business
  + Membership candidates
  + Maintainer candidates
  + Project proposals
* Agenda
  + [Ayush21298] Whereabouts PR review
    - Features completed
    - Unite test and e2e test added
    - May have identified where the e2e test flakes are coming from (!)
      * Disabled a couple cases and saw successes. So somewhat isolated.
      * Miguel unsure if we have flakiness because of kind.
        + Martin and Miguel found that it may have a relationship to CMD CHECK.
        + We're not even doing anything significant with it.
        + But it was like the runtime is sending it
        + Determined that e2e tests use kind + containerd, which doesn't have CMD CHECK implemented. (Implementing CHECK is on my to do list … Zappa)
      * <https://github.com/k8snetworkplumbingwg/whereabouts/pull/250>
  + [Ivan] Whereabouts release for k8s 1.25 support
    - <https://github.com/k8snetworkplumbingwg/whereabouts/issues/269>
    - <https://github.com/k8snetworkplumbingwg/whereabouts/blob/release-v0.5/doc/crds/ip-reconciler-job.yaml#L1>
    - CronJob API promoted to batch/v1
    - Do we want to push v0.5.5?
    - Also in: <https://github.com/k8snetworkplumbingwg/whereabouts/issues/269>
    - Duplicate of <https://github.com/k8snetworkplumbingwg/whereabouts/issues/178>
    - Ivan's got the update for us.
  + [Doug] Whereabouts IP domains
    - Per mentions relationship to VRFs
      * And of course, he's a proponent for overlapping IP addresses!
    - Domain+network nomenclature.
      * Domain + network + IP that's the tuple that's unique
    - Discussion of lofting IP domain
      * That the net-attach-def could know about it, or potentially a k8s native representation of it
    - TODO: Doug to write a feature request for whereabouts
  + K8s native multinetworking
    - Working on getting relevant use cases
      * Want them by the end of the calendar year.
      * 6-7
    - Per brings up dynamic multinetworking
      * Of course, IPv6
      * L3 subnets could come late, e.g. RA
      * May have ethernet (and isis) etc, which doesn't have IP address information
      * Miguel interested in the OVN-multihoming effort
        + Wants kubevirt IP addressing to be represented on the pod

E.g. say from a cloud-init

* + - * + Uses a bridge to switch traffic from pod to VM
      * Mike C
        + *"From a CNI perspective, we have discussed UPDATE/RECONFIGURE of the network namespace. We are waiting to see how this fits into multi network"*
    - Workshops at kubecon
    - Tomo notes that Network Service Mesh design and the proposal for the k8s native network object has the similarity that it doesn't make a consideration for CNI nor for the container runtime
      * Meaning that it can be implemented using something that ignores CNI entirely.
    - #sig-network-multinetwork on k8s slack.

## 

## September 8th, 2022

**Attendees:** Adrian Chiris(Nvidia), Doug Smith (Red Hat), [Leonardo Milleri](mailto:lmilleri@redhat.com)(Red Hat), Eoghan Lawless (Intel), Ivan Kolodiazhnyi (NVIDIA), Tomofumi Hayashi (Red Hat), William Zhao (Red Hat)

* Regular business
  + Membership candidates
  + Maintainer candidates
  + Project proposals
    - [adrianc] sriovnet
      * <https://github.com/Mellanox/sriovnet>
      * It has been raised in network resource mgmt meeting a few times
      * A utility lib for managing sriov VFs and Switchdev
      * Sriovnet is being used in several opensource projects
        + [https://github.com/ovn-org/ovn-kubernetes](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fgithub.com%2Fovn-org%2Fovn-kubernetes&data=05%7C01%7Cadrianc%40nvidia.com%7C44acab00c155416729d808da7def46a7%7C43083d15727340c1b7db39efd9ccc17a%7C0%7C0%7C637960763884219340%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=8VLoT0PRTp9QM8%2BGstIraDPYzFLQgsOEmxlXJkc2ZVk%3D&reserved=0)
        + [https://github.com/k8snetworkplumbingwg/sriov-network-device-plugin](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fgithub.com%2Fk8snetworkplumbingwg%2Fsriov-network-device-plugin&data=05%7C01%7Cadrianc%40nvidia.com%7C44acab00c155416729d808da7def46a7%7C43083d15727340c1b7db39efd9ccc17a%7C0%7C0%7C637960763884219340%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=iHBQJx64Tl0AnvvTib%2FTEvnl7DK6r9P6%2FJ6rS8xN4s8%3D&reserved=0)
        + [https://github.com/k8snetworkplumbingwg/accelerated-bridge-cni](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fgithub.com%2Fk8snetworkplumbingwg%2Faccelerated-bridge-cni&data=05%7C01%7Cadrianc%40nvidia.com%7C44acab00c155416729d808da7def46a7%7C43083d15727340c1b7db39efd9ccc17a%7C0%7C0%7C637960763884219340%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=GohT%2FFgDR1SZ0oOc1%2FEXcZJKXSe690afdjsDSSxrQiw%3D&reserved=0)
        + [https://github.com/k8snetworkplumbingwg/ovs-cni](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fgithub.com%2Fk8snetworkplumbingwg%2Fovs-cni&data=05%7C01%7Cadrianc%40nvidia.com%7C44acab00c155416729d808da7def46a7%7C43083d15727340c1b7db39efd9ccc17a%7C0%7C0%7C637960763884219340%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=SORCgvoMxrCgvDQ3PS39%2FBPooiKIkFTStV4Oy8w0nZg%3D&reserved=0)
        + [https://github.com/k8snetworkplumbingwg/ib-sriov-cni](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fgithub.com%2Fk8snetworkplumbingwg%2Fib-sriov-cni&data=05%7C01%7Cadrianc%40nvidia.com%7C44acab00c155416729d808da7def46a7%7C43083d15727340c1b7db39efd9ccc17a%7C0%7C0%7C637960763884219340%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=cd%2F0FHj3ePJX06MUH6EIdqz%2FdGhQM3hBWu8zDzctvPY%3D&reserved=0)
        + [https://github.com/antrea-io/antrea](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fgithub.com%2Fantrea-io%2Fantrea&data=05%7C01%7Cadrianc%40nvidia.com%7C44acab00c155416729d808da7def46a7%7C43083d15727340c1b7db39efd9ccc17a%7C0%7C0%7C637960763884219340%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=86TuicyADgmal6996389M%2BaNM6Gu%2Ficv%2Fq7q7aMvp60%3D&reserved=0)
        + [https://github.com/kubeovn/kube-ovn](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fgithub.com%2Fkubeovn%2Fkube-ovn&data=05%7C01%7Cadrianc%40nvidia.com%7C44acab00c155416729d808da7def46a7%7C43083d15727340c1b7db39efd9ccc17a%7C0%7C0%7C637960763884219340%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=Itn2dSikvGnt36g8ZdvY%2F6jZ57aqmNytbTW8PflJyCQ%3D&reserved=0)
      * Maintainers: Sebastian S, Adrian C
      * Approved!
      * Comments
        + [Balazs] SR-IOV network operator will also use it. Is there some division of labor here for where functionality will move?

Will be discussed in resource mgt group

* + - [adrianc] multi network policy implementation using linux TC
      * <https://github.com/Mellanox/multi-networkpolicy-tc>
      * TC based implementation of MultiNetworkPolicy API
      * Used in conjunction with accelerated-bridge-cni
        + [https://github.com/k8snetworkplumbingwg/accelerated-bridge-cni](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fgithub.com%2Fk8snetworkplumbingwg%2Faccelerated-bridge-cni&data=05%7C01%7Cadrianc%40nvidia.com%7C44acab00c155416729d808da7def46a7%7C43083d15727340c1b7db39efd9ccc17a%7C0%7C0%7C637960763884219340%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=GohT%2FFgDR1SZ0oOc1%2FEXcZJKXSe690afdjsDSSxrQiw%3D&reserved=0)
      * Maintainers: Adrian
        + Adrian will sync with another maintainer
      * Approved!
* Agenda
  + [Doug] K8s native network object / multi-networking / SIG network announcement
    - Doug gives an overview and how it will impact how our technology in this group is implemented, and likely in the future we will change our technology to be an implementation of this native
      * Would love to collaborate on putting together use cases within this group as well.
    - Tomo's considerations
      * Maciej's currently interested in the API, and not the implementation.
      * This API is just a data definitions, and not semantics for how it will implemented.
      * His example does not use a kubelet, so not interested in potential impacts for how kubelet interaction may play in
    - Would love to have NPWG members join as possible, your voice will be appreciated.

## August 25th, 2022

**Attendees:** Ayush Patel (Samsung), Peter White (Microsoft), Eoghan Russell (Intel), Miguel Duarte Barroso (Red Hat), Eoghan Lawless (Intel), Abdallah Chatila (Kaloom), Tomofumi Hayashi (Red Hat), Doug Smith (Red Hat), William Zhao (Red Hat), Sebastian Scheinkman (Red Hat)

* Regular business
  + Membership candidates
  + Maintainer candidates
  + Project proposals
  + Meeting connection information
    - We don't have access to sig-net
    - We should change to Doug's zoom info
    - Up to a vote: Voted to change
* Agenda
  + [miguel] network plumbing wg wide tests
    - Idea to have a repo on NPWG to integrate projects and to test across them.
      * Origin is that we had a dep on Multus in the whereabouts e2e tests, and when Multus changes came up, Whereabouts e2e tests broke.
    - For example: Multus + admission controller + whereabouts, or Multus + SR-IOV network operator
    - Depending on feedback, what exactly do we want this thing to do?
    - Ayush: Why not use a mock with Gingko test?
      * Doug: It's a possibility for an implementation!
      * When Multus is updated (for example) it updates the mock object.
      * Miguel focused on user flows.
        + Tends to document this for users, as well.
      * Doug
        + Maybe start with user flows in a kind of standard e2e test
        + In parallel: Work to automation with the mocks
      * Miguel: not saying there isn’t room for the 2 options - but I see more value to the users (and devs) in the e2e flow
    - Voting member CI
      * Ayush mentions this is achievable with GH actions and a bot
    - Should we do this on push?
      * If we block on doing a cross project, this could force us to fix dependent projects. So trade off.
    - Next steps
      * Mock up of a cross-repo e2e test?
        + Start simple, maybe a couple repos and do a nightly test.
      * Possibility of voting CI / merge automation, later
      * Merge bot: <https://github.com/marketplace/actions/pr-merge-bot>
        + Miguel: Mind if I start a prototype to add this to whereabouts ?
  + [Ayush21298] [Whereabouts IPv4/IPv6 DualStack](https://github.com/k8snetworkplumbingwg/whereabouts/pull/250) brief discussion
    - Backward compatibility added
      * Took some time after the Multus changes!
      * Now works as of today, updated the test cases.
      * Pending: What was performed manually.
        + Dual stack w/ old configuration
        + Looking to add those.
    - Rebased to master
    - Manual testing done
    - Old test cases updated
    - New test cases in progress
    - Documentation in the end
    - [Abdallah]
      * Regarding backwards compatibility
        + Supported without ip ranges?

Yes. Use ranges and range\_start it will work.

* + - * About multiple ips
        + Surprised by the way it works, was expecting it like host-local
        + Expand ipv4 range, instead of adding new address pool?
        + If you add multiple ips, you add multiple ipv4 ranges instead of a pool from the same ranges…

Which is how it works in host local

* + - * + "Ip with multiple pools" is the idea from Abdallah

Ayush mentions: Map of pools

Would require changes, but wouldn't be too difficult.

* + - * Miguel merged etcd removal?
    - Architectural
    - gRPC client! / General purpose API exposure
      * For backends, decouple between logic whereabouts, and have that gRPC service for doing the data storage.
  + [Doug] K8s native network object
    - Next step: forming use cases

## August 11th, 2022

### *The meeting is cancelled this instance! Catch you all on the 25th! Thanks!*

## July 28th, 2022

NOTE: DIFFERENT ZOOM THIS INSTANCE!

<https://us05web.zoom.us/j/7924491102?pwd=UXZrQ0NnZlhCNENwcW9WWnZFVFB1UT09>

Meeting ID: 792 449 1102

Passcode: 9mr2zu

**Attendees:** Doug Smith (Red Hat), Tomofumi Hayashi (Red Hat), William Zhao (Red Hat), Sebastian Scheinkman (Red Hat), Nikhil Simha (Red Hat), Eoghan Russell (Intel), Leonardo Milleri (Red Hat), Niamh Hennigan (Intel), Andrea Panattoni (Red Hat), Abdallah Chatila (Kaloom)

* Regular business
  + Membership candidates
  + Maintainer candidates
  + Project proposals
  + [Doug] Permanently change zoom?
* Agenda
  + K8s native network object
    - Primary focus was on IPAM, and Per was discussing the implication of IPv6 and slaac.

## July 14th, 2022

NOTE: DIFFERENT ZOOM THIS INSTANCE!

<https://us05web.zoom.us/j/7924491102?pwd=UXZrQ0NnZlhCNENwcW9WWnZFVFB1UT09>

Meeting ID: 792 449 1102

Passcode: 9mr2zu

**Attendees:** Doug Smith (Red Hat), Tomofumi Hayashi (Red Hat), Ivan Kolodiazhnyi (NVIDIA), Michael Zappa (Microsoft), William Zhao (Red Hat), Per Andersson (Kaloom), Abdallah Chatila (Kaloom), Ayush Patel (Samsung) , Niamh Hennigan (Intel), Eoghan Lawless (Intel),

* Regular business
  + Membership candidates
  + Maintainer candidates
  + Project proposals
* Agenda
  + K8s native network object
    - Idea coming from Maciej @ google for a KEP for a network object that could be used for secondary networks
      * Very very early stages.
    - Let's invite Maciej to this call! Cc: Dan
  + Whereabouts dual stack IP address assignment
    - Proposal needs review! No major architecture changes expected.
    - Development in same spot (no rush!)
  + Firewalling on secondary interfaces
    - Can we assume that k8s knows all addresses assigned to a pod?
      * Doug: We use what's in the CNI result for secondary network policy, correct?
        + The network-status annotation is what's used today.
    - Per mentions manually set addresses, SRIOV
      * Could listen to netlink etc.
      * Then get all the IP addresses, and then add those so we have that mapping.
        + Tomo notes eBPF or DPDK won't work.
      * Per notes net-agent and pod-agent
        + Not currently listening to netlink.
    - Doug: We have had some recent discussion about dynamic updates to the network-status annotation, potentially this is related
      * Per's point is rather compelling related to this, do we need a kind of daemon that is capable of figuring out this dynamic IP address information, and updating the status, at least for kernel networking.
        + Then would we need the dynamic capabilities for the service controller and network policy?
      * Plays into CNI 2.0? Possibly more of a thick-plugin-native way of thinking about it in CNI 2.0
    - <https://github.com/containernetworking/cni/issues/823>
      * CNI 2.0 issue for container lifecycle.

## 

## June 30th, 2022

NOTE: DIFFERENT ZOOM THIS INSTANCE! (getting info…)

<https://us05web.zoom.us/j/7924491102?pwd=UXZrQ0NnZlhCNENwcW9WWnZFVFB1UT09>

Meeting ID: 792 449 1102

Passcode: 9mr2zu

**Attendees:** Billy McFall (Red Hat), Tomofumi Hayashi (Red Hat), Balazs Nemeth (Red Hat), Adrian Chiris(Nvidia), Niamh Hennigan (Intel), Doug Smith (Red

Hat), Eoghan Lawless (Intel),

* Regular businessMembership candidates
  + - Niamh Hennigan (Intel)
  + Maintainer candidates
  + Project proposals
    - [eoghan l] multus logging extraction to a standalone logging repo
* Agenda
  + Membership/Maintainer discussion
    - [Doug] TODO: Mark up some sections of the governance.
    - Niamh H (Intel) proposed membership and maintainership, some discussion regarding criteria to become a maintainer to be enhanced. In light of that discussion Niamh rescinded maintainer candidacy for a number of SR-IOV related repositories. We extended the offer to propose candidacy at any time (including this meeting instance).
  + [eoghan l] network operator release
    - <https://github.com/k8snetworkplumbingwg/sriov-network-operator/issues/324>
    - Should we release these dependencies first?
      * sriov-cni v2.6.2 (9 Nov 21) - golang 1.18 and k8s 1.24 merged
      * ib-sriov-cni v1.0.2 (9 Nov 21) - golang 1.18 and k8s 1.24 not merged
      * sriov-network-device-plugin (26 May 22) - golang 1.18 and k8s 1.24 merged
      * network-resource-injector (28 Nov 21) - golang 1.18 and k8s 1.24 merged
      * network operator #287 not merged yet (skip config if policy not applied yet)
    - Balazs helping to give a review
    - Doug offered to tie in some other folks if not resolved today.
  + [eoghan l] multus logging extraction to a standalone logging repo
    - Just putting the idea out there
    - We have a project in Intel that would use a simple logging package like the one in multus (userspace-cni)
      * Billy notes it
    - Doug +1; he's copied it wholesale. This would be useful for other CNI plugins
      * Notes over-arching e2e/integration testing
    - Miguel +1
    - Tomo
      * Multus 4.0 package vs. current: no difference! No changes in 4.0 cycle.
      * Moving Multus log to a repository makes sense, and is OK.
      * At 4.0 release, Tomo could update to vendor this package.
      * Logging can be independent of 4.0

## 

## June 16th, 2022

**Attendees:** Ivan Kolodiazhnyi (NVIDIA), Doug Smith (Red Hat), Tomofumi Hayashi (Red Hat), Eoghan Russell (Intel), Niamh Hennigan (Intel), Eoghan Lawless (Intel), Miguel Duarte (Red Hat), Peter White (Microsoft), Nikhil Simha (Red Hat), Per Andersson (Kaloom), Ayush Patel (Samsung)

* Regular business
  + Membership candidates
  + Maintainer candidates
  + Project proposals
* Agenda
  + [Doug] Whereabouts updates
    - Planning to deprecate etcd: any concerns?
      * Let's tag a release, and create a release branch
      * We'll plan to make fixes to the branch for 90 days.
      * Opened issue: <https://github.com/k8snetworkplumbingwg/whereabouts/issues/231>
    - Dual stack proposal: <https://github.com/k8snetworkplumbingwg/whereabouts/pull/237>
      * Miguel requests a proposal on how to test this functionality
        + Can be done during the implementation, although ideally testing would be designed up front as well.
      * Looks like we're ok to move forward with the IPRanges nomenclature
  + [Doug] Default route network-status changes
    - <https://github.com/k8snetworkplumbingwg/network-attachment-definition-client/pull/42/files>
    - Plan
      * Plan to merge changes to match the current spec
      * Follow up with a dot release of the spec when we have a proposal.
      * Discuss details of PR in multus maintainer's.
    - Dynamic updates to the network-status annotation
      * Any progress on a proposal?
  + [eoghanru] Network Operator Release ?
    - <https://github.com/k8snetworkplumbingwg/sriov-network-operator/issues/324>
    - Last release December
    - Current released package broken with K8s 1.24 due to labels being changed,etc.
    - <https://docs.google.com/document/d/1sJQMHbxZdeYJPgAWK1aSt6yzZ4K_8es7woVIrwinVwI/edit>
  + [Miguel] multus v4 release ?
    - <https://github.com/k8snetworkplumbingwg/multus-cni/discussions/853> has been ignored for a few weeks
    - Tomo working on hardening and testing locally, notes that documentation is still pending.
      * Believe we may have progress in the next couple weeks and then we'll have a PR for multus 4.0 into master.
    - Candidate in feature/multus-4.0 branch

## 

## June 2nd, 2022

**Attendees:** Doug Smith (Red Hat), Eoghan Russell (Intel), Miguel Duarte (Red Hat), Peter White (Microsoft), Eoghan Lawless (Intel), Sebastian Scheinkman (Red Hat), Nikhil Simha (Red Hat), William Zhao (Red Hat), Tomofumi Hayashi (Red Hat), Ayush Patel (Samsung)

* Regular business
  + Maintainer candidates
    - Sebastian Scheinkman
      * [k8snetworkplumbingwg/sriov-network-metrics-exporter](https://github.com/k8snetworkplumbingwg/sriov-network-metrics-exporter)
* Agenda
  + [Doug / Miguel] Dynamic updates to the network-status annotation
    - Can we simply add a "Implementations may choose to update network-status when $properties have been dynamically modified"
      * No.
    - Tomo would like to see a field for when the change was made / by what component.
    - We'll need a proposal doc for this.
  + [eoghanru] Maintainer volunteers
    - <https://github.com/k8snetworkplumbingwg/sriov-network-metrics-exporter>
  + [Ayush21298] Whereabouts Dual Stack support
    - <https://github.com/k8snetworkplumbingwg/whereabouts/issues/212>
    - Currently only a single range can be specified.
    - If a pod could be assigned multiple address based on multiple ranges
      * E.g. private 1, private 2 + one more
    - If we give this ability in whereabouts based on multiple ranges, we can support dual stack.
    - Ayush doesn't think it would present major issues given this approach.
    - [Miguel] Can you request multiple interfaces?
      * It wouldn't be dual stack for multiple interfaces.
      * [Miguel] You can use this multiple times for the same interfaces?
    - [Doug] Design proposal
      * The JSON data structure
      * Ensure compatibility with the current JSON data structure
      * How it integrates with IP reconciliation.
      * Let's create a whereabouts/docs/design\_proposals
        + With markdown contents.
  + Multi-Network Service Mesh
    - More of an update coming up in a couple weeks
    - Doug looking at where he can slot in time / resources for the same, especially against upstream Istio.
    - OSM has implemented some of the functionality, but parameterizing via a config file. They haven't exposed it via annotations.
      * Possibly looking at how this could feed into upstream.

## May 19th, 2022

**Attendees:**

* Regular business
  + Membership candidates
  + Project candidates
    - [Adrianc] proposal to Add Ivan Kolodiazhny(NVIDIA) as maintainer in sriov-network-operator
      * No against, so approved.
* Agenda
  + [Doug (will not be present)] Default route network-status changes
    - <https://github.com/k8snetworkplumbingwg/network-attachment-definition-client/pull/42/files>
    - Need to consider what's up when we have SLAAC
    - It could be confusing that we have an IPv4 address listed, but, then IPv6 is configured with SLAAC.
    - Doug needs to follow up to see if we show the empty list when it's IPv6 default route with no address specified.
    - Miguel: isn’t this just another flavor of “updates” to the network-status annotation ? My point is it should either be in the result of the attachment, or, it \*is\* an update to the status.
  + [Adrianc] multi-networkpolicy TC implementation brainstorming

## May 5th, 2022

**Attendees:** Doug Smith (Red Hat), Ivan Kolodiazhnyi (NVIDIA), Maciej Skrocki (Google), Abdallah Chatila (Kaloom), Eoghan Russell (Intel), Hanamantagoud (EST)

* Regular business
  + Membership candidates
  + Project candidates
* [Doug/Tomo] Multus: Kubelet client / checkpoint file
  + Would like to remove the checkpoint API in the coming future.
  + Kubelet pod resources feature beta in 1.15, 1.13-1.14 is alpha. So enabled as default since 1.16
  + Anyone disabling pod resource api? Why?
  + Can we bring this to the resource management group? Eoghan Russell will bring to this call (thank you!)
* [Doug] Default-route proposal: Update
  + Turns out that the deficiency we noted doesn't actually include the examples (they do exist)
    - [Proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)
    - But, we may still need to improve the language related to IPv6.
  + There's a regression in the Multus mainline, not in the most recently tagged versions where default-route selection isn't functioning properly (pod won't launch)
    - And the default-route result.
  + We'll be adding e2e tests to avoid this regression in the future.
    - Also note: Nikhil Simha has been instrumental in improving unit and e2e testing, especially for Multus and Whereabouts. Recently e2e tests to be written in go for Whereabouts, making them much more maintainable.
    - We're hoping to get some help from Nikhil on this as well :)

## 

## April 21st, 2022

**Attendees:** Peter White (Microsoft), Nikhil Simha (Red Hat), Ivan Kolodiazhnyi (NVIDIA), Doug Smith (Red Hat), Eoghan Russell (Intel), Miguel Duarte (Red Hat), Eoghan Lawless (Intel),

* Regular business
* [Doug/Miguel] Dynamic changes to the network-status annotation
  + For a case involving kubevirt:
    - "*The pod interface will not have an IP address. So far so good - we only want L2 in it - we'll then setup an IP on the VM via cloud init, or DHCP on host-network, for instance.*
    - *... now comes the tricky part. The pod's status - network-status - annotations will* ***not*** *have an IP address.*"
    - Could this be updated via a patch operation to reflect the state of the pod?
    - Discovered during exploration of using multi-network policy, which didn't pick up on the rules because of the lack of ip address.
  + Should the network-status be dynamic?
    - Our spec reads that "*A network attachment operation’s status map shall contain information taken from the result of the attachment operation for the given network*"
    - We don't say it should necessarily be static or dynamic, just that it's the result of "the attachment operation"
      * Two thoughts behind this, it could potentially be "outside of the attachment operation" in that it happens long after the attachment is made, it boots, DHCP happens, etc etc.
      * Is the attachment operation that finite, though?
  + Worth asking ourselves if we want to further pin this down, or expand it for the dynamic nature of things.
  + Tomo brought up server side apply: <https://kubernetes.io/docs/reference/using-api/server-side-apply/>
    - And mentioned "*Server side apply (SSA) checks who changed which fields. So we may need to check whether our design (to change status by 2+ components) fits it or not. (but still K8s 1.23 partially introduced SSA yet)*"
    - SSA may cause [conflicts](https://kubernetes.io/docs/reference/using-api/server-side-apply/#conflicts) when the single value is modified by several components
  + CMD Check
    - Plugin should check attributes are the same as expected or not (and then exit non zero when not expected)
  + For design: Seems reasonable
  + For implementation: Need to think about what the network-status should be. Today it is simply the CNI result output.
    - Need to clarify the specification for dynamic attachments.
    - Need to come up with a feasible way given SSA.
      * Not comprehensively used, in k8s api side, this creates metadata management field, for which component modifies which field.
      * That is: which field is owned by which component.
      * The API may reject if you're not the owner.
      * May need to common component
        + E.g. daemon to make request to update this
        + Adds complexity.
  + Next steps
    - Dynamic updates are reasonable, design wise, we need some implementation considerations and details.
    - Let's put together a proposal for a specification update.
    - And include language that implementations *should* cooperate with SSA (or something on those lines)
* [Doug/Peter] Service mesh proposal
  + [Proposal doc](https://docs.google.com/document/d/1nR8WIzbideTAKUlc89OARrg2pI1E49-oKtKmTyI9-CI/edit?usp=sharing)
  + We're happy with the structure of the spec, let's move forward with implementations and feed the input back into the spec
  + Miguel also interest from istio on kubevirt perspective, will also review.
* [Doug] Automagic veth repair
  + What if an underlying device is removed, say for a bridge or a macvlan, during pod runtime. Could there be a way to detect this situation and intervene for repair? Repair, restart?
    - Mostly a thought experiment.
  + Possibility for CNI 2.0?
    - Given the possibility of more interactivity during pod runtime.
  + Start collecting our considerations for CNI 2.0
* [Peter] meeting up at KubeCon Europe?
  + Doug attending!

## 

## April 7th, 2022

**Attendees:** Doug Smith (Red Hat), Miguel (Red Hat), Eoghan Lawless (Intel), Abdallah Chatila (Kaloom), Hanamantagoud(EST), Billy McFall (Red Hat), Andrea Panattoni (Red Hat), Nikhil Simha (Red Hat), Ravindra Thakur (EST), Vivek Thrivikraman (EST)

* Regular business
  + Member Candidates
  + Maintainer Candidates
    - Whereabouts IPAM CNI: Miguel Duarte de Mora Barroso
  + Project Candidates
* [Doug Smith/Peter White] multi-network service mesh proposal [last meeting update Feb 24] <https://docs.google.com/document/d/1nR8WIzbideTAKUlc89OARrg2pI1E49-oKtKmTyI9-CI/edit?usp=sharing>
  + Doug & Nikhil have thoroughly reviewed and have no major changes, really happy with the general proposal and structure.
  + Will look further at naming conventions as well as text formatting
  + Next will be to move forward on a POC implementation upstream in concert with Peter's implementation to feed this back into the proposal.
* [Hanamantagoud]
  + Is there any test framework for measuring KPI for secondary networks ?
    - For SR-IOV: <https://github.com/k8snetworkplumbingwg/sriov-network-metrics-exporter>
  + Want to upstream our KPI testcases which use the E2E framework.
  + E2e test framework for kind in Multus
    - Those are functional test cases.
    - Enhance those as a part of github actions, but have to run those test cases on dedicated hardware.
    - Need dedicated machines to accurately collect those metrics.
  + Can we extend the e2e tests for Multus?
    - Definitely a possibility.
    - First steps: Make sure it can run against any k8s not just a kind cluster.
    - Following this: Could extend the tests to include sample workloads or traffic generation to then collect performance data.
  + Tomo advises this should be outside of CI
    - Tomo notes that Multus doesn't have an impact on the transport itself, since it just plumbs it and does not carry the traffic (the delegated CNI plugin does)
    - Also notes that ipvlan / macvlan uses kernel stack so it's very CPU dependent.
      * So would likely would be impact given CPU.
    - These numbers could be utilized by users to inform their decisions.
  + Hanamantagoud may look into exploring some further work in this regard and a proposal.
* [Miguel] status of multus 4.0 branch
  + Current state / next steps
  + I now see a huge rebase is required for [PR](https://github.com/k8snetworkplumbingwg/multus-cni/pull/777)
  + Was the history of the branch re-written ?
    - Tomo has changed some commits to squash-and-merge.
    - This has rewritten history.
    - Should Miguel rebase right now?
      * Tomo advises no, and wait until stabilization, for further discussion at Multus maintainer's meeting next week.
  + E2e tests failed on the latest change to the branch
  + Tomo notes that 4.0 branch is in a transitional state due to the changes for the thick plugin.
    - Includes various features such as the server.
    - Tomo has made some enhancements for configuration.
    - Looking into changes regarding metrics.

## March 24th, 2022

**Attendees:** Doug Smith (Red Hat), Nikhil Simha (Red Hat),Sebastian Scheinkman (Red Hat), Dimitrios Markou (EST), Abdallah Chatila (Kaloom), Peter White (Microsoft), Maciej Skrocki (Google), Tomofumi Hayashi (Red Hat)

* Regular business
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
* Topics
  + Kubecon EU 2022 Meeting
    - Round table discussion
    - Possible ideas
      * Multus 4.0
      * Service mesh
      * CNI 2.0 opinions
      * Service abstraction: well known label for endpoint slices
        + Possibly headless services
    - Let's also get a virtual option going
  + [Doug Smith] multi-network service mesh proposal [last meeting update Feb 24] <https://docs.google.com/document/d/1nR8WIzbideTAKUlc89OARrg2pI1E49-oKtKmTyI9-CI/edit?usp=sharing>
    - Peter looking into timing for starting on implementation, hopefully weeks away.
    - Helpful to get some focus on the naming conventions and syntax for annotations

## March 10th, 2022

(Doug Smith won't make it this instance, could someone please volunteer to run the call? Thanks!) -> Tomo will drive the meeting.

**Attendees:**  Tomofumi Hayashi (Red Hat), Nikhil Simha (Red Hat), Niamh Hennigan (Intel), Abdallah Chatila (Kaloom), Hanamantagoud(EST),Vivek Thrivikraman (EST), Peter White (Microsoft) Siva Kumar Perumalla (EST), Dimitrios Markou (EST)

* Regular business
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
* [Tomo] Working on multus major update
  + Thick plugin architecture (i.e. client/server architecture)
    - Thick plugin introduce ‘server’, hence multus no longer ‘one shot process’
    - This can introduce metrics, dynamic attachment functionality, etc.
      * Some of this will introduce 4.0 but not everything. Please be patient..
  + CNI Spec ver 1.0 support
    - Of course, user need to use 1.0 support delegated CNI plugins as well as Kubernetes which support CNI 1.0…
      * At least, the latest KIND does not support CNI 1.0 yet
    - Hence this 1.0 support is not ‘immediately use feature’, this is a kind of preparation…

## February 24th, 2022

**Attendees:** Doug Smith (Red Hat), Siva Kumar Perumalla (EST),Vrinda Punj (Red Hat), Eoghan Russell (Intel), Tomofumi Hayashi (Red Hat), Nikhil Simha (Red Hat), Maciej Skrocki (Google), Dimitrios Markou (EST), Abdallah Chatila (Kaloom), Niamh Hennigan (Intel), Vivek Thrivikraman (EST), Hanamantagoud (EST), Peter White (Microsoft), Suresh Krishnan (Kaloom), Per Andersson (Kaloom), Sebastian Scheinkman (RedHat)

* Regular business
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
    - [Siva Kumar Perumalla] Bringing sriov-network-metrics-exporter repo to NPWG.
      * <https://github.com/intel/sriov-network-metrics-exporter>
      * Maintainers
        + Eoghan Russell (Eoghan1232)
        + Eoghan Lawless (EoghanLawless)
        + Siva Kumar Perumalla (esiperu-est)
* [Doug] Feature branch for Multus for thick plugin & dynamic attachments
  + <https://github.com/k8snetworkplumbingwg/multus-cni/tree/feature/multus-4.0>
  + Current work in a feature branch in order to address both architecture and fine details as this represents major changes.
  + [Tomo] Mainly focused on the thick plugin, however, this also have major changes.
    - Includes CNI 1.0 spec support implemented in multus-4.0 branch
    - Will still have a thin-plugin mode, just the one-shot process (e.g. without requiring the daemon)
    - Let's remove the duplicated status annotation
      * Requires changes to net-attach-def client library.
* [Peter White] Feedback welcome on multi-network service mesh proposal, now updated: <https://docs.google.com/document/d/1nR8WIzbideTAKUlc89OARrg2pI1E49-oKtKmTyI9-CI/edit?usp=sharing>
  + Looking for input!
  + Changes anticipated to go directly into service mesh code ([Open Service Mesh · GitHub](https://github.com/openservicemesh))
    - The iptables rules differ across service meshes, so they need to be service-mesh-specific.
    - Doug happy to hear it's about getting the code in-tree for service meshes instead of having an external out-of-tree component which may need to chase "moving targets" for iptables rules from differing service meshes
* Doug will miss the next instance. We'll get someone else to stand in to run the meeting.

## 

## February 10th, 2022

**Attendees:** Doug Smith (Red Hat), Eoghan Russell (Intel),Tomofumi Hayashi (Red Hat), Billy McFall (Red Hat), Balazs Nemeth (Red Hat), Abdallah Chatila (Kaloom), Nikhil Simha (Red Hat), Dimitrios Markou (EST), Peter White (Microsoft), Vivek Thrivikraman (EST), Eoghan Lawless (Intel), Niamh Hennigan (Intel), Ravindra Thakur (EST), Suresh Krishnan (Kaloom),

* Regular business
  + Member Candidates
  + Maintainer Candidates
    - Balazs Nemeth bn222 - sriov-cni, ib-sriov-cni, Sriov-dp-admission-controller, Sriov-device-plugin, Sriov-network-operator, App-netutil, Network-resources-injector
  + Project Candidates
* Multi-network service mesh update
  + Peter has some projects that would like this to have this implemented in a next couple of months, in a short term.
  + Looking to having the spec touched up in the short term for review. Looking for the next two weeks to sign off.
  + Reach out to Doug and Fatih for some input! (And anyone else interested please reach out to Peter White)
* Multus-service demo
  + Video is created and now working on blog article
    - Video (uncut, no edit ver.) is available in below (previous agenda) // but keep in mind that it is only for NPWG members, not shared!
  + Demo resources <https://github.com/redhat-nfvpe/multus-service-demo>

## January 27th, 2022

**Attendees:** Peter White (Microsoft), Doug Smith (Red Hat), Nikhil Simha (Red Hat), Eoghan Russell (Intel), Vivek Thrivikraman (EST),Sebastian Scheinkman (Red Hat), Suresh Krishnan (Kaloom), Hanamantagoud(EST), Abdallah Chatila (Kaloom), Alok Gupta (Ericsson), Ivan Kolodiazhnyi (NVIDIA),Dimitrios Markou (EST),Niamh Hennigan (Intel)

* Regular business
  + (none this week)
* [Tomo] Update on demo movie on multus-service
  + Now working on recording and it will be finished in this week (tomorrow)
  + URL: <https://youtu.be/efRE1EyrNyQ>
    - no edit, uncut!. Will be edited to add caption and some picture (diagram) and upload to somewhere as an official demo movie. This uncut movie is only for the NPWG community!
* [Doug] Multus dynamic attachment / hot plug function / thick plugin architecture
  + Still working through design considerations for proposed change
    - <https://github.com/k8snetworkplumbingwg/multus-cni/pull/771>
  + Goals
    - Retain API (don't change parameters for exported functions)
    - Retain thin plugin functionality
    - Looking to community for further input
    - Feel free to join maintainer's meeting (on opposite Thursday)
* Multinetwork service Mesh
  + Peter hoping to dredge up some time for it! Hoping to get more help from around the table.
  + This is a solid identified gap, and is ripe for contributions from those looking to get involved.
  + Two docs here: <https://docs.google.com/document/d/1aD12rid1RmhiFKqEDk4pjV_Ne-qB4LjsbeGM6wauQfM/edit?usp=sharing>  
    <https://docs.google.com/document/d/1nR8WIzbideTAKUlc89OARrg2pI1E49-oKtKmTyI9-CI/edit?usp=sharing>
* [sivakumarperumalla] Multus macvlan dynamic provisioning
  + <https://github.com/k8snetworkplumbingwg/community#topic-specific-meetings>
  + Glad to have some help! Thanks
  + Dimitris to Sivakumarperumalla: Clarification is this the same as dynamic attachments?
    - Still learning about this.
    - Using multus+macvlan

## January 13th, 2022

**Attendees:** Dimitrios Markou (EST), Eoghan Lawless (Intel), Eoghan Russell (Intel), Maciej Skrocki (Google), Doug Smith (Red Hat), Nikhil Simha (Red Hat), Billy McFall (Red Hat), Balazs Nemeth (Red Hat), Suresh Krishnan (Kaloom), Abdallah Chatila (Kaloom), Sebastian Scheinkman (Red Hat), Per Andersson (Kaloom), Peter White (Microsoft), Vivek Thrivikraman (EST), Fatih Nar (Red Hat), Hanamantagoud (EST), Ivan Kolodiazhnyi , Tomofumi Hayashi(Red Hat) Kevin Clarke(Intel)

* Regular business
  + Member Candidates
  + Maintainer Candidates
    - Kevin Clarke (Intel)- Sriov-cni, Sriov-device-plugin, sriov-network-operator, network-resource-injector, bond-cni
  + Project Candidates
* [Doug] Default-route updates
  + [Proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)
  + Not ready for vote today (sorry!)
  + **TODO: Add agenda item to additional tech discussion for VRFs in the context of the default-route updates**
* [Seba] Reviews on the bond-cni open PRs
  + <https://github.com/k8snetworkplumbingwg/bond-cni/pull/26>
  + <https://github.com/k8snetworkplumbingwg/bond-cni/pull/25>
  + Bond CNI
    - Is this applicable for the resource mgt group?
    - Good place to look for some reviews as well.
    - [Topic specific meetings](https://github.com/k8snetworkplumbingwg/community#topic-specific-meetings)
    - [Resource mgt agenda](https://github.com/k8snetworkplumbingwg/community#topic-specific-meetings)
* [Kevin] Where's the member list?
  + Github is the source of truth, and should be accurate
  + But… The members / maintainer's markdown is out of date:
    - <https://github.com/k8snetworkplumbingwg/community/blob/master/MAINTAINERS.md>
    - <https://github.com/k8snetworkplumbingwg/community/blob/master/MEMBERS.md>
    - ...These are out of date.
* [Dimitris] Any updates from Multus-service project (presentation, demo recordings,etc.. ? )
  + Sorry but no update yet, but some article will be soon…
  + Thank you please send me the link of the article when it is ready if you can: dimitrios.markou@est.tech . Thanks again!
  + We’ll inform it in NPWG meeting (and agenda docs) once it appeared.
* [Doug] Multus dynamic attachment / hot plug function / thick plugin architecture
  + Proving to be tricky to come to an implementation
  + Couple pull requests from Miguel on this one, Doug and Tomo reviewing and looking into architectural progression
  + Some considerations
    - Would it be in another repo or core multus? Still something we're considering as we hone the implementation details. Possibly controller in external repo.
    - How much resource consumption?
      * Likely more in the thick plugin architecture
      * Stated goal is to have a thin plugin option, and retain that (example usage: edge computing environment, don't have the process resident in memory if you don't need the functionality)
    - Want to make sure we don't change APIs / usage for regular users
      * Absolutely a #1 goal.
* [Doug] Device plugin for host-device
  + [https://github.coma/containernetworking/plugins/blob/master/plugins/main/host-device/host-device.go](https://github.com/containernetworking/plugins/blob/master/plugins/main/host-device/host-device.go)
  + Idea: A device plugin would help to scale the use of this
  + Trying to get some initial feedback or garner any interest.
  + [Ivan] could you please clarify use-cases for it? Network Operator successfully uses this CNI with SR-IOV Device plugin

## December 30th, 2021

(Meeting cancelled, happy new year!)

## December 16th, 2021

**Attendees:** Doug Smith (Red Hat), Eoghan Lawless (Intel), Peter White (Microsoft),Sebastian Scheinkman (Red Hat), Adrián Moreno (Red Hat), Balazs Nemeth (Red Hat), Dimitrios Markou (EST), Tomofumi Hayashi(Red Hat),Vivek Thrivikraman (EST), Abdallah Chatila (Kaloom), Adrian Chiris (Nvidia), Billy McFall (Red Hat), Suresh Krishnan (Kaloom), Hanamantagoud (EST), Ivan Kolodiazhny (NVIDIA), Maciej Skrocki (Google),

* Regular business
  + Member Candidates
    - Sebastian Scheinkman
  + Maintainer Candidates
    - Sebastian Scheinkman - Sriov-cni, Sriov-device-plugin, sriov-network-operator, network-resource-injector, bond-cni
  + Project Candidates
    - [Govdpa](https://github.com/redhat-virtio-net/govdpa): Govdpa is intended to be a library capable of managing (creating and inspecting) vdpa devices.
      * Currently being used in the the [PR that adds vdpa support to the sr-iov network device plugin](https://github.com/k8snetworkplumbingwg/sriov-network-device-plugin)
      * Vendor-agnostic
      * Multi-bus (SR-IOV, ancillary)
      * Dependencies:
        + (future) <https://github.com/vishvananda/netlink>
      * Maintainer candidates: Adrián Moreno (Red Hat), Billy McFall (Red Hat). More wellcome!
  + Meetings during holiday season
    - Doug proposes to cancel the meeting on Dec 30th.
* [Abdallah Yasin]
  + CI Robot account is ready, needs to be added to the projects, robot account name: npwg-robot
  + Credential repo needs to be created and credentials for the robot account will be added to the repo, and shared with the robot maintainers.
* [Peter White]
  + Initial proposal regarding multi-network service mesh: <https://docs.google.com/document/d/1nR8WIzbideTAKUlc89OARrg2pI1E49-oKtKmTyI9-CI/edit?usp=sharing>
  + eBPF service mesh: <https://isovalent.com/blog/post/2021-12-08-ebpf-servicemesh>
* [Doug] Default-route updates
  + [Proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)
  + Doug and Tomo made a point-by-point run-through
  + Changes are still pending to the proposal
    - Need change regarding allowance of empty default-route list
    - Also need to add to main document, including the missing network-status annotation

## December 2nd, 2021

**Attendees:** Ivan Koldiazhnyi (NVIDIA), Abdallah Yasin (NVIDIA), Doug Smith (Red Hat), Eoghan Russell (Intel), Tomofumi Hayashi (Red Hat), Sebastian Scheinkman (Red Hat), Abdallah Chatila (Kaloom), Hanamantagoud(EST), Ravindra Thakur (EST), Peter White (Microsoft), Suresh Krishnan (Kaloom), Billy McFall (Red Hat),Vivek Thrivikraman (EST), Eoghan Lawless (Intel), Niamh Hennigan (Intel), Balazs Nemeth (Red Hat)

* Regular business
  + Member Candidates
    - Eoghan Lawless (Intel)
    - Balazs Nemeth (Red Hat)
  + Maintainer Candidates
    - Eoghan Lawless (Intel) - <https://github.com/EoghanLawless>
      * + SRIOV CNI, NRI, DP, Network Operator
    - Balazs Nemeth (Red Hat)
      * SRIOV CNI, NRI, DP, Network Operator
  + Project Candidates
  + Meetings during holiday season
    - Doug proposes to cancel the meeting on Dec 30th.
* [Doug] Licenses / copyrights
  + From Red Hat Open Source Program Office: "*So, turns out you're not the only project to deal with this. The answer is that CNCF legal needs to give you a course of action. Which means that you, as project maintainer, need to create a ticket in CNCF service desk:* [*https://cncfservicedesk.atlassian.net/servicedesk/customer/portal/1*](https://cncfservicedesk.atlassian.net/servicedesk/customer/portal/1)"
  + And that also [paraphrased] "It'll take them a while."
  + Official working group status?
    - What does it buy us? Should we consider it?
    - Need to find out the next steps.
    - **TODO Doug: Find out what the process is, and if there's any information about what this entails (for better or worse).**
* [Tomo] Trying to propose new label, `service.kubernetes.io/service-proxy-name`, for endpoint/endpointslice to Kubernetes (sig-network)
  + Context: Similar to current well known label, but relative to headless services for k8snpwg/multus-service.
  + Is there any valid reason (as ‘general’ purpose for Kubernetes, not for multus)?
  + Example (kep for service.kubernetes.io/service-proxy-name): <https://github.com/kubernetes/enhancements/tree/master/keps/sig-network/2447-Make-kube-proxy-service-abstraction-optional>
    - This suppresses the kube proxy side, to create the iptables
    - So it's for endpoint and endpointslices.
  + Sig-network doesn't put an emphasis on Multus, so we'd like to think of other use cases for this particular feature, so that when we propose the KEP, there's some more "oomph" behind it.
* [Tomo] `default-route` annotation change in multus
  + Currently `default-route` annotation only changes actual routing table and keeps CNI result without change (i.e. add/del default route) hence it might happen command CHECK error. Should we change multi-net-spec? (I suppose we don’t need, but let me double check)
  + [Doug] Related, also need to add the network-status change
    - [Original default-route proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)
    - Looks like there was a mistake and there is supposed to be a status annotation for this
      * **TODO: Doug will add a proposed change to the working doc for the spec regarding network-status, and we can vote on it in the next meeting**
* [Abdallah Yasin] Discuss the github CI/CD account Amendment <https://docs.google.com/document/d/1lIWOK-W6fb1VZiSjO1BoFUs0TmoVwgd4XuVc6mtJk2c/edit#heading=h.jltys38rhgql>
  + Decide on a name for the account
    - npwg-robot
  + Email will be a gmail account
    - npwg-robot@gmail.com
  + Decide on a maintainer
  + Next steps:
    - Abdallah will move ahead with creating a GitHub account / gmail account.
    - Abdallah will update the amendment text and we'll vote next session.
    - Wants to be a maintainer/have access:
      * Eoghan1232 ([eoghan.russell@intel.com](mailto:eoghan.russell@intel.com))
* Bond CNI now under NPWG!
* Peter White working through early stages of service mesh draft

## November 18th, 2021

**Attendees:** Doug Smith (Red Hat), Eoghan Russell (Intel), Hanamantagoud(EST), Miguel Duarte (Red Hat), Maciej Skrocki (Google), Niamh Hennigan (Intel), Abdallah Chatila (Kaloom), Eoghan Lawless (Intel), Nikhil Simha (Red Hat), Tomofumi Hayashi (Red Hat), Adrian Chiris(NVIDIA), Ivan Kolodiazhnyi (NVIDIA), Abdallah Yasin (NVIDIA), Peter White (Microsoft), Dimitrios Markou (EST) Per Andersson (Kaloom), Adrián Moreno (Red Hat), Billy McFall (Red Hat), Balazs Nemeth (Red Hat)

* Regular business
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
* [abdallahyas] Should a robot account be created for vendor specific CI.
  + [Proposed patch](https://github.com/k8snetworkplumbingwg/sriov-network-operator/pull/163)
  + Doug notes that it seems like a good idea. If Abdallah Y.
  + Robot is a normal GH user, and we can change the privileges to allow the robot the privileges.
  + Can be linked to external CI/CD tools (such as Jenkins!)
  + Governance extension to handle having a shared account for this [[governance doc](https://docs.google.com/document/d/1lIWOK-W6fb1VZiSjO1BoFUs0TmoVwgd4XuVc6mtJk2c/edit)]
    - Things to add to the doc
      * Point person / maintainer for account
      * How credentials will be stored
      * Who should have access (point person + GH admins?)
    - Adrian Chiris & Abdallah Yasin will work
* [Doug] Istio annotation clobbering
  + Possible change + dev workflow: <https://gist.github.com/dougbtv/babe9b59e4d54e7a0fc67f134b74b908>
* [Miguel] CNI results & default-route config on the network selection element
  + NAD w/out routes => <https://pasteall.org/Tryr>
    - Has no route info in the CNI result
  + NAD w/ routes => <https://pasteall.org/uOJV>
    - Has route info in CNI result
  + Is this intentional to have no route info in the CNI result
    - Tomo notes the initial implementation only filtered out the default route.
    - But there's been further work (Doug thinks it's his fault)
  + Tomo notes that we should look at the initial design/specification and ensure this is covered in the specification
  + [Original default-route proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)
  + Looks like there was a mistake and there is supposed to be a status annotation for this
    - **TODO: Doug will add a proposed change to the working doc for the spec regarding network-status, and we can vote on it in the next meeting**
    - Doug & Tomo to sync about this as well
  + Miguel will also add an issue to Multus regarding the CNI results missing route information, as well.
    - <https://github.com/k8snetworkplumbingwg/multus-cni/issues/760>
* [EoghanR] any update on changing licensing? Doug.
* [EoghanR] Bond CNI
  + Ready move, pending the time for getting the move going!
* [Dimitris] Distribute recording regarding the service abstraction Tomo’s demo
  + <https://github.com/k8snetworkplumbingwg/multus-service>
  + Tomo pending a new recording (with improvements from recent development)

## November 4th, 2021

**Attendees:** Doug Smith (Red Hat), Eoghan Lawless (Intel), Lars Ekman (EST), Tal Liron (Red Hat), Abdallah Chatila (Kaloom), Niamh Hennigan(Intel), Jose Nuñez (Red Hat), Eoghan Russell (Intel)[], Sebastian Scheinkman (Red Hat), Billy McFall (Red Hat), Balazs Nemeth (Red Hat), Suresh Krishnan (Kaloom), Gong Zhang (VMware), Dimitrios Markou (dimitrios.markou@est.tech) (EST), Peter White (Microsoft), Ian Cooli dge (Google), Harsh Modi (Google)

* Regular business
  + Member Candidates
    - Tal Liron (Red Hat)
    - Jose Nuñez (Red Hat)
  + Maintainer Candidates
    - Multusctl
      * Tal Liron (Red Hat) (GH: tliron)
      * Jose Nuñez (Red Hat) (GH: jnunyez)
  + Project Candidates
    - [Tal, Jose] [multusctl](https://github.com/tliron/multusctl) as project candidate
      * Multusctl -- a command line utility for managing Multus and net-attach-defs
      * Maintainers proposal candidate: Tal and Jose
  + We vote in favor unanimously!
* [Doug] Annotation for dynamic attachments
  + Idea being: "*something to signal when hotplug net X iface Y started; succeeded; or failed because of Z*"
  + Another option would be for the client to match "networks" w/ "network status"
  + Is this something we'd like to specify?
    - Is network-status not enough? Possibly since the case where network-status isn't just static after pod creation, we might want to know when/what happened.
  + This could just be outside of the spec, naturally.
    - +1 for now, it seems to be specific to implementation. how about to get prototype and feedback?
  + Abdallah notes that it could be useful, to see back in time.
    - Following kubernetes, looking at timestamps.
  + Kubernetes events
  + Fields
    - Timestamp
    - Net-attach-def name / selection name
    - Error message
    - Fault mode?
      * Operationally blocked / removed for fault
  + Next steps: Talk to Miguel about what's he's got, get a strawman, and propose it to the group.
* [Gong] CNI plugin release plan? Specifically, what’s the target date of next whereabouts release?
  + Working on packaging, and the Whereabouts tagged release is out of date.
  + Added to Multus maintainer's call to get new release tagged.
* [Kevin C] What is consistent manner to annotate and subsequently query network details, so that POD scheduling/ other processing can determine the network they need in a semantic manner. In a node built up of multiple different network interfaces. There may be many ways of finding what networks are possibly available.
* Node interface type { queuing / memory mapping / SRIOV / fabric
* Customer Usage { “media-net” / “storage” / “controlplane}”
* Bandwidth
* Hardware type
* L3 connectivity..maybe
  + Is there some way or standard or richness so that this can be queried?
  + Can this be presented in the Multus annotation...
    - So that the most suitable node can be selected?
  + Dimitris mentions this is covered with SR-IOV, and OVS CNI
    - OVS CNI has an admission phase.
  + Ian brings up: [kubernetes-sigs/node-feature-discovery](https://github.com/kubernetes-sigs/node-feature-discovery)
  + Possibility of stare-and-compare against NFD and/or SR-IOV DP and OVS CNI, and the requirements for this type of node scheduling, and if there's not a match maybe we should put together a strawman about this.
    - Also checkout network resource injector.
* [Dimitris] Recording of service abstraction
  + Doug to check with Tomo to get a new recording / if it's ready for distribution
* [Harsh] ACC100 / sr-iov FEC operator
  + Adding accelerator support to SRIOV Network Operator
  + Changes in February may have prevented some acceleration for some devices (?)
  + Doug advises bringing this to [the resource management call & agenda](https://docs.google.com/document/d/1sJQMHbxZdeYJPgAWK1aSt6yzZ4K_8es7woVIrwinVwI/edit#).
  + Discussion has been happening that functionality such as this could be divided into the specific CNI plugins (example: switchdev)

## 

## October 21st, 2021

**Attendees:** Eoghan Lawless (Intel), Doug Smith (Red Hat), Tomofumi Hayashi (Red Hat), Vivek Thrivikraman (EST), Ivan Kolodiazhny (Nvidia), Suresh Krishnan (Kaloom), Abdallah Chatila (Kaloom), Lars Ekman (EST), Hanamantagoud(EST), Jose Nuñez (Red Hat), Alok Gupta (Ericsson), Niamh Hennigan(Intel), Kevin Clarke (Intel), Billy McFall (Red Hat), Eoghan Russell (Intel), Per Andersson (Kaloom), Peter White (Microsoft)

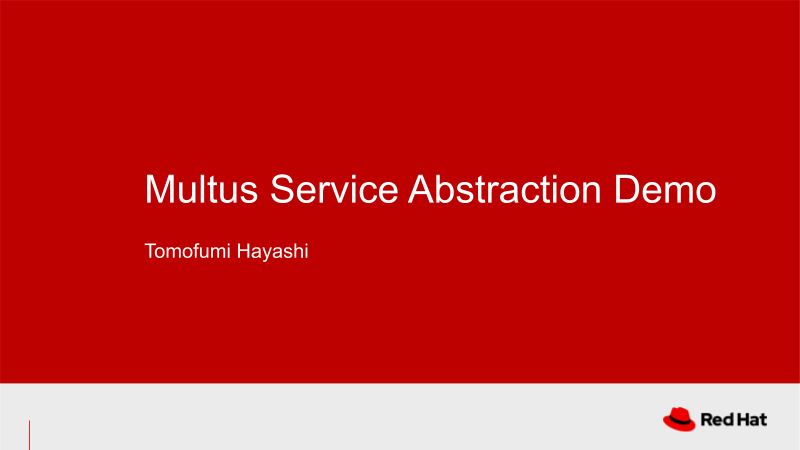
* Regular business
  + Member Candidates
  + Maintainer Candidates
    - <https://github.com/k8snetworkplumbingwg/resource-mgmt-utils>
    - [eoghan.russell@intel.com](mailto:eoghan.russell@intel.com) (Eoghan1232)
  + Project Candidates
    - Bond CNI
      * Maintainers
        + Doug Smith (RH)
        + [eoghan.russell@intel.com](mailto:eoghan.russell@intel.com) (Eoghan1232)
* [Jose] multusctl as project candidate
  + Multusctl -- a command line utility for managing Multus and net-attach-defs
* [Tomo] Headless service for multus network?
  + Headless service assumes all client uses CoreDNS (i.e. Kubernetes cluster DNS) for default DNS…
  + Looking for any input on possible use cases for headless services for secondary networks?
    - In some ways: it's easy (doesn't require load balancing)
    - In the way Tomo describes: the most important items on the network may be external to the k8s cluster and can't access CoreDNS. So it might not be useful.
  + [Peter W] Idea where there's pods on a secondary network, and they're coming and going, and having IPs assigned, it could be a convenient way to have these IP addresses listed, and a way to query for them?
    - Could be useful in this sense, no hard usecase though -- at this time.
    - Reason for headless service in this case?
      * Peter mentions there's possibilities where there just might not be a need for load balancing.
    - Likely useful, but, not necessary essential.
* [Doug] Service Mesh considerations
  + Annotation clobbering
    - Doug has on his to-do list to propose upstream PR against Istio webhook to prevent having the network selection annotation clobbered.
  + problem statement and proposals document @ <https://docs.google.com/document/d/1aD12rid1RmhiFKqEDk4pjV_Ne-qB4LjsbeGM6wauQfM/edit#>
* [Kevin C] Bond-CNI
  + All set, and ready to transfer! Thanks to Intel
  + Officially voted in as well.
* [Doug] File headers and licenses
  + Doug still pending a discussion with open source resources at RH to help with guidance.
* Multus dynamic attachments
  + <https://github.com/kubevirt/community/pull/134>
  + Any input appreciated!

## October 7th, 2021

**Attendees:** Eoghan Lawless (Intel), Peter White (Microsoft), Balazs Nemeth (Red Hat), Tomofumi Hayashi (Red Hat), Or Shoval (Red Hat), Maciej Skrocki (Google), Hanamantagoud(EST), Ivan Kolodiazhnyi (Nvidia), Per Andersson (Kaloom), Suresh Krishnan (Kaloom), Nikhil Simha (Red Hat),Niamh Hennigan(Intel), Abdallah Chatila (Kaloom), Billy McFall (Red Hat), Vivek Thrivikraman (EST), Eoghan Russell (Intel), Lars Ekman (EST)

* Regular business
  + Member Candidates
    - Or Shoval
  + Maintainer Candidates
  + Project Candidates
* [Doug] Normalizing our file headers (for Apache 2 license)
  + [Kubernetes kubelet example header](https://github.com/kubernetes/kubernetes/blob/master/cmd/kubelet/kubelet.go#L1-L15)
  + Should we start some work on normalizing our headers?
  + Multus headers are in a somewhat disorganized state after the repository has moved.
  + Do we want a "Copyright" line?
    - Ivan K notes that it can have confusion where people put their own names, company names, etc.
    - "Network Plumbing Working Group Authors", possible for copyright.
  + License Suggestion - Instead of full license in file header, use the following format and have a LICENSE file in repo root directory:  
    // SPDX-License-Identifier: Apache-2.0
  + Normalizing, good, but, what legally how does it work? With removing, editing, adding, etc.
  + TODO: Doug to follow up with RH resources for OSS legality / counsel.
  + Intel: Who could speak to the Multus copyright?
* [Tomo] Release planning/strategy responsibility (continuing discussion from Eoghan R’s last comment)
  + I believe the project owner should be responsible for release planning/strategy, including tagging because each project has each policy and each situation…
    - Each project has its own trajectory
  + If we have a release every 6 months, it doesn't have to be all projects.
* [Tomo] Demo for service abstraction (if time allows, require 25min+, guess…)
  + <https://github.com/k8snetworkplumbingwg/multus-service>
  + Slide Deck (currently a stub for Tomo to fill in)
    - <https://docs.google.com/presentation/d/1sJhjIW2bOQ0GzX8VXuD-DMqj-3GwWSEDRgoi1QAd8qo/edit#slide=id.p>
  + About selecors: <https://github.com/kubernetes/kubernetes/issues/87412#issuecomment-937889134>
* [Or Shoval] Hello, Or Shoval from Red Hat here,

Participating in Kubemacpool, and would like to become a member of NPWG please.

****

## Sept 23rd, 2021

**Attendees:** Doug Smith (Red Hat), Tomofumi Hayashi (Red Hat), Dimitrios Markou (EST), Ivan Kolodiazhnyi (Nvidia), Hanamantagoud(EST),Vivek Thrivikraman (EST), Periyasamy Palanisamy (EST), Eoghan Lawless (Intel), Abdallah Chatila (Kaloom), Nikhil Simha (Red Hat), Ravindra Thakur(EST), Eoghan Russell (Intel), Niamh Hennigan(Intel), kevin Clarke (Intel), Alok Gupta (Ericsson), Peter White (Microsoft)

* Regular business
  + Member Candidates
    - Nikhil Simha (Red hat)
  + Maintainer Candidates
  + Project Candidates
    - [tomo]Multus-proxy
    - [tomo]Multus-service-controller
* [Doug] Bond CNI
  + Any chance we could ask Intel if it's possible to move this repo under the NPWG?
  + Eoghan: Currently discussing / looking for a timeline to release. Looks good for the time being. Have a definite answer by next for when, basically.
  + Two other possibilities:
    - Userspace CNI https://github.com/intel/userspace-cni-network-plugin
    - SRIOV Metrics Exporter https://github.com/intel/sriov-network-metrics-exporter :)
* [Doug] Multus dynamic attachments [[github issue](https://github.com/k8snetworkplumbingwg/multus-cni/issues/585)]
  + [Enhancement proposal for kubevirt](https://github.com/kubevirt/community/pull/134/files)
  + Question: Predictable / dynamic interface names as opposed to net1,net2,...,netN
    - What did Kactus do again? Thanks.
    - Hash -- "net" and then instead of numerals, use md5sum from the key of the network, and fit the maximum size of the device name (20 characters)
    - Hashing the network name, have it be the network name and interface so that it's more (human) meaningful
  + What happens to traffic when you remove an interface?
    - Could be easier to inject new interface first.
      * Then you detach the old interface after.
      * Possibly any other reconfiguration at this point.
    - Is there a way to mark that the interface is "blocked"
      * Is there a methodology for this? That this resource is there, but it's "blocked"
      * And then when drained, perform the delete.
* [Doug] Whereabouts race condition + optimization updates
  + MONSTER thanks to Martin Kennelly who's uncovered a massive issue with run away processes, as well as found an option for
    - And also Miguel Duarte for assistance, and Tomo's original implementation of leader election.
  + Hopeful that the design for optimization can be postponed for the short term, and put it on the long-term plans for Whereabouts
  + <https://github.com/k8snetworkplumbingwg/whereabouts/pull/142>
  + <https://github.com/k8snetworkplumbingwg/whereabouts/pull/145>
* [Doug] Proposal to add definitions for "thick plugin" and "thin plugin" to the NPWG specification
  + I went to see if we had it defined, and while we reference thick plugins, we never define them.
  + [Proposal document](https://docs.google.com/document/d/1JXt9w69WUXYSDqRSdQJfC7EBqiIaG7XxnkAClT0Sj3A/edit#).
* [Doug] Allow : (colon) in network selection annotation?
  + For example: k8s.v1.cni.cncf.io/networks: macvlan-conf-1@ens33:1
  + The spec doesn't disallow it, it says DNS-1123 format for net-attach-def names, but, not for how they're used with the @interface value
  + From: <https://github.com/k8snetworkplumbingwg/multus-cni/issues/720>
  + How is colon used in linux kernel for network name?
    - Can we create a physical interface name with a colon?
    - Need to double check against the linux kernel
    - Abdallah notes that this is a semantic for layer 3 in the kernel. +1 from Kevin.
  + May need to check our previous discussions about interface names.
* [Eoghan] : Tagging:
  + <https://github.com/k8snetworkplumbingwg/sriov-network-operator/pkgs/container/sriov-network-operator>
  + ghcr.io/k8snetworkplumbingwg/sriov-network-operator@sha256:d7e00e67b3dd08b617b58b946d5011180bd96366691f42e0bdc2b2c2d1cf558e
  + Can we somehow have it clearly linked to a version? Or a specific tag basically?
    - There's image tags for each commits, but, need for each release to be tagged.
    - When to cut a new release?
      * So far, only one release: v1.0.0.
      * Possibly continuous release?
  + for each release, there should be a tag, and the container images should be "pullable" by that tag also.
  + Should we normalize this over the entire NPWG?
* [Abdallah]: is there a provision in the spec. to define a relationships between networks: kind of parent/child e.g. bond/vlan and enslaved devices
  + Currently, nothing in the spec to address this.
  + The CNI needs it, or the CNI passes to container?
    - An attribute to the annotation.
  + Possible next step: Propose a strawman with example annotation(s)/annotation attribute in order to demonstrate the hierarchy

## 

## Sept 9th, 2021

**Attendees:** Hanamantagoud(EST), Doug Smith (RH), Maciej Skrocki (Google), Dimitrios Markou (EST), Peter White (Microsoft), Ivan Kolodiazhnyie (Nvidia), Vivek Thrivkraman (EST), Abdallah Chatila (Kaloom), Eoghan Lawless (Intel), Suresh Krishnan (Kaloom), Tomofumi Hayashi (Red Hat), Alok Gupta (Ericsson), Or Shoval (Red Hat), Niamh Hennigan(Intel), Aaron Smith (RH), Patryk Strusiewicz-Surmacki (Intel), Billy McFall (Red Hat), Eoghan Russell (Intel), Kevin Clarke (Intel)

* Regular business
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
* Service Mesh considerations
  + Thank you Peter for putting together the problem statement and proposals document @ <https://docs.google.com/document/d/1aD12rid1RmhiFKqEDk4pjV_Ne-qB4LjsbeGM6wauQfM/edit#>
    - Multiple services in play -- what does each do? Peter interested in looking into how this is implemented in each one.
    - Peter's case, just sniff eth0, not net1,2,3...
      * Fatih's, configurable, which to sniff and not sniff.
    - One approach as mentioned by Tomo is to have the implementation pass along CNI runtime args, which would fit the CNI spec, and then not ask service meshes to read annotations, if they don't (Istio happens to).
    - Each service mesh will have their own way of capturing that traffic whereas Multus is unified functionality.
      * This unified functionality could be captured in a library.
    - Doug voices that he'd like to avoid creating iptables rules in some CNI implementation (e.g. Multus or a chained CNI plugin) for the possible "moving of the goalposts" by each individual service mesh and having to update it for each change by the service meshes themselves.
  + Sticky issue; Istio clobbering the network selection annotation
    - In order to make Istio useful
    - Istio CNI currently overwrites the network selection annotation, which makes Multus essentially useless from a user perspective. That is, if a user sets:
      * k8s.v1.cni.cncf.io/networks: macvlan-conf
      * Istio CNI will change that to:
      * k8s.v1.cni.cncf.io/networks: istio
    - Outdated references, but, how Istio is writing the annotation is:
      * <https://github.com/istio/istio/blob/4316169acb056756843c11d289a0f05a39300b71/pkg/kube/inject/webhook.go#L783-L786>
    - Doug's sample experiment that "worked" (on his machine) in spring 2020
      * <https://pastebin.com/YDix0uFZ>
    - How Maestra (Red Hat Istio distribution) solves it:
      * <https://github.com/Maistra/istio/blob/ef9a0d567296c0a1f08893653ee3227b8697eca8/pkg/kube/inject/webhook.go#L620>
* [Hanamantagoud]
  + What is the goal of multus+service-mesh(istio) initiative ? To support telco usecases ?
    - [Fatih's blog article](https://medium.com/open-5g-hypercore/episode-iii-meshville-7f0bb7ca0e3b)
    - [Tomo] What is the telco use case for service mesh, to begin with?
      * Peter has management networks, and data networks, and want the traffic inspection on the management.
        + Largely, for TCP traffic. Some of HTTP.
        + Service meshes will support all TCP traffic -- HTTP has some additional functionality in a service mesh situation, and *mutual TLS is key*.
    - Hanamantagoud notes that telco traffic in many cases does not go through the kernel stack.
    - Next step for service mesh effort:
      * Goals and non-goals
  + UDP , SCTP support ?
    - In Peter's case, he's resigned to the fact that service meshes won't encrypt these.
  + Plan to support non-kernel/user-space interfaces such as dpdk/sr-iov
    - Peter has edge cases where user space networking has places where it does send traffic to the kernel.
  + Non-NAT forwarding support ?

## 

## Aug 26th, 2021

**Attendees:** Tomofumi Hayashi (Red Hat), Eoghan Lawless (Intel), Fatih Nar (Red Hat), Doug Smith (Red Hat), Hanamantagoud (EST), Nikhil Simha (Red Hat), Eoghan Russell (Intel), Billy McFall (Red Hat), Suresh Krishnan (Kaloom), Niamh Hennigan(Intel), Abdallah Chatila (Kaloom), Ravindra Thakur (EST), Peter White (Microsoft), Ivan Kolodiazhnyi (NVIDIA) Per Andersson (Kaloom)

* Regular business
  + Governance update
    - [Proposal to change governance doc](https://docs.google.com/document/d/1lIWOK-W6fb1VZiSjO1BoFUs0TmoVwgd4XuVc6mtJk2c/edit) to express that we wish there to be two or more maintainers for a new proposed project.
      * " In order to accept a project, two or more maintainers must also be proposed along with the project"
        + In "governance: section c"
        + From the doc to approve it: *there shall be 5 or more members available to vote and there shall be no more than 50% representation of members in employment of the same employer*
      * Accepted!
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
  + NPWG Group acceptance to email list - [eoghan.russell@intel.com](mailto:eoghan.russell@intel.com)
    - Still waiting to be accepted..
      * <https://groups.google.com/g/network-plumbing-working-group>
    - **TODO: Doug: accept Eoghan.**
* [Doug / Fatih] Service Mesh considerations
  + Fatih Nar has pointed out that something that happens with Istio is that envoy (? could be another component) sniffs traffic for ALL interfaces.
    - This could expose performance problems for network intensive workloads that have service mesh sidecars.
  + [Fatih has recently written a blog article](https://medium.com/open-5g-hypercore/episode-iii-meshville-7f0bb7ca0e3b) about Multus + Service Mesh with telco considerations. And pointed out this failing.
  + Open questions:
    - Casey Callendrello pointed Doug at [this code in istio-cni](https://github.com/istio/istio/blob/6da7a3193970e46ebe6cf748f6411f1de1d286ec/cni/pkg/plugin/redirect.go#L196), which reads annotations and sets up filtering rules for how traffic is captured.
      * <https://istio.io/latest/docs/reference/config/annotations/>
      * Casey pointed out there's a number of ways it's done, and it could be extended to have include/exclude specific interfaces.
      * Could it be as simple as having istio-cni always filter traffic on ONLY net0? That would cover the majority of cases? Yes/No?
        + Tomo mentioned we might want to consider the usecases for service mesh for telco, and see
      * This could possibly be a short term solution
        + It also has parameters for subnet, so you could potentially use that right now as a short-term solution.
    - Tomo pointed out to Doug that it's possible that other service meshes (outside of istio, such as Linkerd) may also need to respect this, should we have something in our specification for how service meshes could enable/disable sniffing?
      * That is… So that we can have a service-mesh-agnostic method to express this.
    - Fatih's article proposed one idea of having a change to the selection annotation in JSON format, to include a new parameter "sidecar: enable/disable" in order to express this.
      * Is this the right approach?
      * Tomo noted there's a possibility we could also send CNI runtime args to delegate plugins.
    - Use cases
      * You might have control on net1, and data on net2, and the data is encrypted, you want to ignore it, but… you'd want to be analyzing data on net1.
    - Istio + Multus integration challenges
      * Istio adding fake net-attach-def, and clobbering the \*/networks annotation.
        + ...at least at some point in time.
      * Additionally, the istio-cni doesn't actually create an interface, which is different.
      * Istio-cni could potentially be changed to be a meta/chained plugin.
      * Tomo proposes that we could work with the istio community in order to assert this change and bring their CNI plugin in line with the CNI specification.
    - Challenges of annotation
      * In the selection annotation (\*/networks): there's no map from what has enabled/disabled service mesh to which is the resulting interface name
      * ...The service meshes would have to read the result annotation (\*/network-status)
  + What's next?
    - Fatih to look into what e/// was doing
      * If there's an intention to upstream their solution
    - Write down the problem, and what they requirements are
* [Kevin] Public calendar / invite
  + From Kevin's mail:
    - just continue your normal call to meet and include k8smeet@gmail.com in the To:
    - <https://calendar.google.com/calendar/embed?src=k8smeet%40gmail.com>
      * If you want to share a forced tz to view you can add something suitable at end of URL
      * <https://calendar.google.com/calendar/embed?src=k8smeet%40gmail.com&ctz=America%2FNew_York>
    - There is also ical link
      * <https://calendar.google.com/calendar/ical/k8smeet%40gmail.com/public/basic.ics>

## 

## Aug 12th, 2021

**Attendees:** Doug Smith (Red Hat), Eoghan Lawless (Intel), Eoghan Russell (Intel), Abdallah Chatila (Kaloom), Alok Gupta (Ericsson), Ivan Kolodiazhnyi (Nvidia) Kevin Clarke (intel), Adrian Chiris(Nvidia), Gary Loughnane (Intel), Maciej Skrocki (Google), Dimitrios Markou (EST), Billy McFall (Red Hat), Tomofumi Hayashi (Red Hat), Hanamantagoud (EST),Vivek Thrivikraman, Suresh Krishnan (Kaloom)

* Regular business
  + Member Candidates
  + Maintainer Candidates
    - Ivan Kolodyazhny: CNI reference plugins
    - Doug Smith: CNI reference plugins
  + Project Candidates
    - <https://github.com/k8snetworkplumbingwg/plugins>
      * Fork of the CNI reference plugins. Proposed by Ivan for use in reference deployments.
      * Mostly to build image with CNI plugins to use with Multus
      * Accepted.
* Topics
  + [adrianc] K8s network & resource management WG meetings - easier way to get meeting invite ?
    - Meeting information is currently published in related projects [CONTRIBUTING.md](https://github.com/k8snetworkplumbingwg/sriov-network-device-plugin/blob/master/CONTRIBUTING.md). ATM each participant just creates his own meeting series with the needed information. Is there an easier way ?
      * E.g have an option to self-sign to the meeting via k8snetworkplumbingwg google group ? or similar?
      * [Doug] There is also [the README.md for the community repo](https://github.com/k8snetworkplumbingwg/community) which lists this meeting and the ancillary meetings.
    - [Doug] Attempted to create a public calendar invite from a personal google groups account and sent it to the mailing list.
      * Attempted to create [event link](https://calendar.google.com/event?action=TEMPLATE&tmeid=N2phZzB1c3BscDA0cWFjcnV0b29qMTl0aXBfMjAyMTA4MTJUMTMzMDAwWiBkb3VnbGFza2lwcHNtaXRoQG0&tmsrc=douglaskippsmith%40gmail.com&scp=ALL)
    - [Kevin] public google calendar
      * And <https://www.ieee802.org/3/calendar.html>
      * TODO: Kevin to write up how we might manage such a thing.
    - Can we create it directly from the google group itself?
      * TODO
  + [kevin clarke] Service Discovery for Multus - next steps
    - Tomo gives an update on his progression and advises about discussion happening in the "additional technical discussion" meeting (On Tuesdays following this meeting) [[agenda and meeting minutes](https://docs.google.com/document/d/129FUXBHvKMOVwsvjgYzZX4CorsN_uJwHTdo8DXs1Tpk/edit#)]
    - Tomo likely to target a first milestone for service abstraction in early September. And to have a limited demonstration of his current iteration of service abstraction.
  + [Doug] Whereabouts: optimization following fix for race condition
    - To be discussed in the "additional discussion" call, which happens on Tuesdays [[agenda and meeting minutes](https://www.google.com/url?q=https://docs.google.com/document/d/129FUXBHvKMOVwsvjgYzZX4CorsN_uJwHTdo8DXs1Tpk/edit%23&sa=D&source=calendar&ust=1607275227216000&usg=AOvVaw1FEnxaPipTtJRA0Db_m-OE)]
    - The gist is that we fixed a race condition using the k8s backend, however, we sacrificed some performance in order to do so.
    - A discussion regarding the design for optimizing this functionality has been started, and we're looking to make the improvements in the short term.
  + [Dimitris] SRIOV Device Plugins
    - All of the bookkeeping is done by the kubelet, so it asks DP to allocate X number of devices, and the DP does the allocation, and then returns the necessary mounts for the devices.
    - So if the allocation happens with an init container, and that exists, it won't release the resource?
      * Dimitris planning to test it out. Theory is that it won't be released
  + [Doug] TODO: Draft a change to the governance.

## July 29th, 2021

**Attendees:** Tomofumi Hayashi (Red Hat), Patryk Strusiewicz-Surmacki (Intel), Eoghan Russell (Intel),Michael OReilly(Intel) , Periyasamy Palanisamy (EST), Gary Loughnane (Intel), Dimitrios Markou (EST) Per Andersson (Kaloom), , Suresh Krishnan (Kaloom)

* Regular business
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
* Topics

## July 15th, 2021

**Attendees:** Patryk Strusiewicz-Surmacki (Intel), Tomofumi Hayashi (Red Hat), Ivan Kolodiazhnyi (Nvidia), Eoghan Russell (Intel), Peter White (Microsoft), Gergely Csatari (Nokia), Vivek Thrivikraman (EST), Suresh Krishnan (Kaloom)

* Regular business
  + Member Candidates
  + Maintainer Candidates
    - Eoghan Russell ([eoghan.russell@intel.com](mailto:eoghan.russell@intel.com)) (GitHub: Eoghan1232)
      * Network Resource Injector
      * SRIOV CNI
      * SRIOV DP
      * SRIOV Network Operator
      * Accepted
    - Michael O’Reilly ([michael.oreilly@intel.com](mailto:michael.oreilly@intel.com)) (Github: michaeloreillyintel)
      * Network Resource Injector
      * SRIOV CNI
      * SRIOV DP
      * SRIOV Network Operator
      * Accepted
  + Project Candidates
    - Multusctl -- a command line utility for managing Multus and net-attach-defs
      * Wanted to have two maintainers
      * Also possibility for having sriov type functionality in a \*ctl utility, and it might be nice to share the same codebase.
      * We had some push back regarding the
* Topics
  + [Doug] Governance -- 2 maintainers
    - We note that you need 2 maintainers to merge a PR
    - But, we don't otherwise require it, maybe we should make it a requirement for a new project. Shows interest, and makes so that PRs can be merged in accordance with the governance.
    - *TODO Doug: Draft up a change for the 2 maintainers*
  + [Levo]: DANM Controllers deep-dive / walkthrough
    - Follow-up on the agreed agenda point from a month ago
    - Mostly replaying some older demo videos
    - Will try to get a live env as well
  + [Doug] SRIOV common functions library
    - <https://github.com/k8snetworkplumbingwg/sriov-cni/issues/187>
    - Brings up that we need common functionality in a library instead of decentralized in a bunch of repos.
    - Do we want to move forward, it also needs a name.

## 

## July 1st, 2021

**Attendees:** Tomofumi Hayashi (Red Hat), Eoghan Russell (Intel), Adrian Chiris(Nvidia), Periyasamy Palanisamy (EST), Dan Williams (Red Hat), Suresh Krishnan (Kaloom), Billy McFall (Red Hat), Michael O’Reilly(Intel), Patryk Strusiewicz-Surmacki (Intel)

* Note: Doug will be absent for this instance
* Regular business
  + Member Candidates
    - Eoghan Russell (Intel) [eoghan.russell@intel.com](mailto:eoghan.russell@intel.com)
      * Accepted Eoghan's member candidate proposal
    - Michael O’Reilly - [michael.oreilly@intel.com](mailto:michael.oreilly@intel.com) (Intel)
      * Accepted Michael's member candidate proposal
  + Maintainer Candidates
  + Project Candidates
    - Multusctl -- a command line utility for managing Multus and net-attach-defs
      * From Tal Liron who attended a previous session to speak and demonstrate this utility, however, we didn't have quorum to accept.
      * There's also been a number of recent fixes/improvements to address TODOs and add parameterization based on container runtime (e.g. crio vs. docker-style k8s defaults for
      * Proxy vote for yes: Doug Smith
      * Tomo expects Tal to be maintainer
      * Condition: Approved if maintainer entries
  + AdrianC mentioned we should have at least two maintainer for all projects (it is documented)
* [Adrianc] 3rd party CI for npwg projects - best practice to provide access to report pass/fail
  + NVIDIA have a “CI github user” which we give write permissions to the projects.
    - Is that OK approach ? (not sure if there is another)
      * Seems everyone in the meeting is OK with this approach.
      * Todo: Tomo asks Doug after his PTO and then let AdrianC know.
    - Alternative: <https://docs.github.com/en/actions/hosting-your-own-runners/about-self-hosted-runners>

## June 17th, 2021

**Attendees:** Doug Smith (Red Hat), Ivan Kolodiazhnyi (Nvidia), Maciej Skrocki (Google), Yury Kulazhenkov(NVIDIA), Gergely Csatari (Nokia), Peter White (Microsoft), Periyasamy Palanisamy (Ericsson Software Technology), Alok Gupta (Ericsson), Billy McFall (Red Hat), Dimitrios Markou (EST), Tomofumi Hayashi (Red Hat)

* Regular business
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
* *(Recap, carried over from last session)* [Adrianc] CRDs in projects within NPWG: group name convention
  + [Doug / Peng] Should someone approve a new api group / subdomain (?) on k8s.cni.cncf.io -- is it the CNI maintainers? maybe?
  + Which group name (prefix) should we use ? K8s.cni.cncf.io ?
    - Multi-networkpolicy, net-attach-def CRD uses it
  + Alternatives:
    - k8s.cni.npwg.io
    - K8s.npwg.io
* [LeventeK/Levovar] Discuss making [DANM](https://github.com/nokia/danm) Controllers meta agnostic, potentially move under NPWG
  + List of Controllers which might potentially hold generic use value:
    - <https://github.com/nokia/danm/blob/master/user-guide.md#usage-of-danms-netwatcher-component>
    - <https://github.com/nokia/danm/blob/master/user-guide.md#usage-of-danms-svcwatcher-component>
    - <https://github.com/nokia/danm-utils#danm-cleaner>
    - <https://github.com/nokia/danm-utils/blob/master/policer_user_guide.md>
  + PoCing viability: <https://github.com/nokia/danm/pull/247>
  + Gauge interest, discussion with community about effort/benefits, potential high-level changes required in the Controllers and in Multus in case of positive reception (spoiler: minimal in both, see PoC)
  + Next steps: Levo will follow up with some presentations / demos so we can all get some eyes on the details, and we'll start to talk about where there are commonalities and move onto design details.
* [Nishant] Pull request for net-attach-def status field
  + <https://github.com/k8snetworkplumbingwg/network-attachment-definition-client/pull/38>
  + Tomo notes that...
    - We'll need a specification change proposal.
    - From a design perspective, net-attach-def is for networks, however there may be a confusion from a user perspective as to what "status" means (e.g. is it related to networks?), and maybe possibly need a change of name (such as "operator-status")
      * Annotation field is used in the net-attach-def CRs across a number of projects, so it's possible that an alternative approach could be taken that uses annotations.
      * Tomo advises use of annotations for now, and later we could make a specification update, as a path to move forward.
  + Clarifying questions from Maciej, How is this used, exactly?
    - Who updates those?
    - If a network attachment is "wrong" what does that mean?
    - Nishant has written a controller which watches the NAD, in the reconciliation logic some other objects are created, depending on the result if the object couldn't be created, there's a success/failure/other type of status.
    - In an admission controller, could you handle the failure modes?
    - Some perspectives voiced that these error states aren't necessarily appropriate for the NetworkAttachmentDefinition
      * It may be solution dependent. Possibly we need some clarification on the general applicability of the status field addition.
      * Again, for a solution dependent usage, the annotations may be appropriate to use, as they are arbitrary and not specified by the net-attach-def spec.
  + Next step:
    - 1. Could look into annotations and/or admission controller?
      * <https://github.com/k8snetworkplumbingwg/net-attach-def-admission-controller>
    - 2. In parallel (or in serial, if the annotations / admission controller doesn't fit the bill), could work on a proposal for a specification update?
      * Example proposal (for default route selection): <https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit>
      * Proposal should address why annotations or the admission controller isn't sufficient.

## June 3rd, 2021

**Attendees:** Doug Smith (Red Hat), Tomofumi Hayashi (Red Hat), Maciej Skrocki (Google),Peter White (Microsoft), Suresh Krishnan (Kaloom), Ivan Kolodiazhny (Nvidia), Jeff d'ambly (netskope), Yury Kulazhenkov (Nvidia), Billy McFall (Red Hat), Gary Loughnane (Intel), Alok Gupta (Ericsson), Per Andersson(Kaloom), Gergely Csatari (Nokia)

* Regular business
  + Member Candidates
  + Maintainer Candidates
    - Ivan Kolodiazhnyi (Nvidia) for <https://github.com/k8snetworkplumbingwg/helm-charts>
    - Accelerated-bridge-cni
      * Yury Kulazhenkov (Nvidia)
  + Project Candidates
    - accelerated-bridge-cni
      * [Yury K] accelerated-bridge-cni discussion
        + Overview:

[Accelerated-bridge CNI overview](https://docs.google.com/document/d/1wn5HqckPs3SjQNHubMbo7X0YN2_yTnxK18jL7DTifGk/edit?usp=sharing)

<https://github.com/Mellanox/accelerated-bridge-cni>

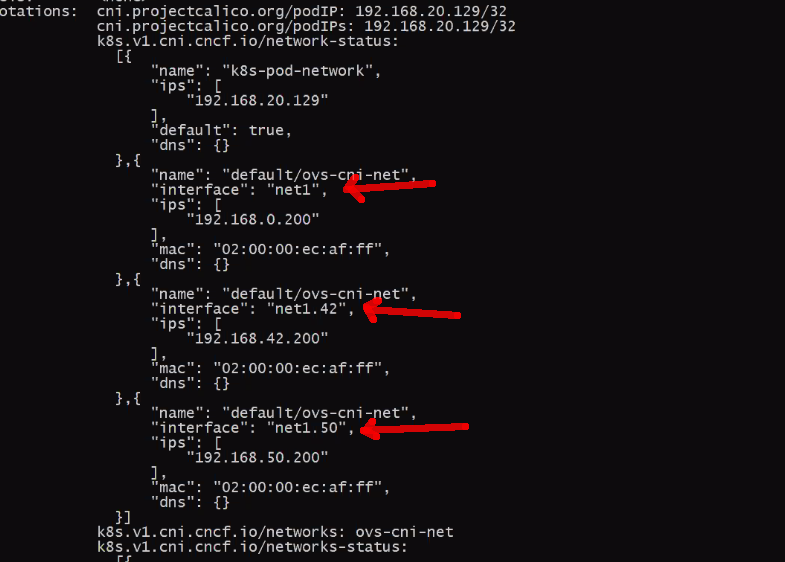
* + - * + Moving repo to npwg
  + Accepted both new projects and both maintainers.
    - **TODO**: Update the community for this.
* [Doug] NPWG GH repo -- LGTM.com integration
  + I noticed this is enabled for the whole org -- that's totally fine, but do we mind if we configure it "per repo"?
    - I didn't disable it right away in case it's relied on for other repos.
  + We'll make it per repo and it can be reenabled.
* [Doug] VRFs on secondary networks (have we discussed this before? probably…)
  + Doug notes that Per mentioned this end of 2020, seems.
  + Any conclusions or other discussions that Doug missed?
    - VRF CNI reference plugin came about end of 2020
    - Doug checks the alt meeting notes as well, Tomo doesn't recall any conversation.
* [Adrianc] CRDs in projects within NPWG: group name convention
  + Which group name (prefix) should we use ? K8s.cni.cncf.io ?
    - Multi-networkpolicy, net-attach-def CRD uses it
  + Alternatives:
    - k8s.cni.npwg.io
    - K8s.npwg.io
  + A change may be non-trivial
    - due to adoption of net-attach-def / the associated selection annotation
    - Would require a migration plan
  + [Maciej] using `k8s.cni.cncf.io` in sriov operator
    - <https://github.com/k8snetworkplumbingwg/sriov-network-operator/pull/101#issuecomment-849321218>
    - Changes from openshift.io to k8s.cni.cncf.io
      * Discussion limited to: Do we have the mandate to use this name?
        + Doug mentions we'll probably have it for selection annotation
        + Billy gives a +1 re the group name, and mentions we should be able to use any sub-names
        + Tomo gives a +1 for the current group name

Possibly change group name for new major version of net-attach-def or otherwise major change.

* + - * Technical considerations (including migration of names) left to maintainers for now.
* [Alok] Kubernetes (external) Networking Orchestration for Multus secondary networks.
  + Presentation Link: [External Network Operator (ENO).pdf](https://drive.google.com/file/d/1jAMpQbnr8QzEMXM65a_G8MbFMU61PUsS/view?usp=sharing)
  + ENO Github link: <https://github.com/Nordix/eno>
    - **[WIP]** For ENO fabric plugin: <https://github.com/Nordix/eno/tree/fabricPlugin>
  + ENO API Data Model: [ENO External Networking Data Model.pdf](https://drive.google.com/file/d/1YSexxyVZHrihczXlaPcnWLzcH1SbtZuL/view?usp=sharing)
  + Discussion in CNCF CNF WG: <https://github.com/cncf/cnf-wg/discussions/118>

## May 20th, 2021

**Attendees:** Dimitrios Markou (EST), Doug Smith (RH), Adrian Chiris (Nvidia), Jan Scheurich (Ericsson), Peri (EST), Abdallah Chatila (Kaloom), Billy McFall (Red Hat), Peter White (Microsoft)

* Regular business
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
* [Jan/Peri] Enhance VLAN trunking with IPAM in OVS CNI plugin
  + Presentation slides:  
    [Enhanced VLAN trunking in OVS CNI Network Attachments.pdf](https://drive.google.com/file/d/1bsy6TMsXP58A-B-RBuwMhYo5VLcXGSZN/view?usp=sharing)
  + How can we support for trunk interfaces for secondary networks using our reference implementation
  + OVS CNI when it comes to kernel interfaces,
    - access interfaces (through a veth pair connected to a tagged port in OVS)
      * Can work with ipam modules (such as Whereabouts)
    - Trunk interfaces, transparent trunk interfaces and selective trunk interfaces
      * Can see tagged traffic on parent interfaces
      * There's no support for ipam, as the parent interface isn't the one that should have the ip address assigned
      * There should be vlan sub interfaces that are configured with ip addresses
    - Proposal that's here today, to suggest way forward for ipam on these trunk interfaces
    - Enhance OVS CNI with optional IPAM configuration, which would invoke the IPAM CNI several times
      * And then could create vlan sub interfaces, and then apply IPAM configuration for each
      * And then OVS CNI would return information for all of the sub interfaces
  + Peri has a PoC with the necessary enhancement, and then two small changes in Multus. And the net-attach-def-client to demonstrate how it could work.
  + LAG?
    - Maybe/possibly on parent interfaces, but not in this proposal.
    - There is a DPDK application flavor, but, not as relevant (e.g. re: IPAM)
    - VLAN sub interfaces, and automate the creation and IPAM for them.
  + (Demo from Peri)
  + No change the CNI results (aside from
    - Change is to Multus ([pull request](https://github.com/k8snetworkplumbingwg/multus-cni/pull/662/files)) and net-attach-def-client ([pull request](https://github.com/k8snetworkplumbingwg/network-attachment-definition-client/pull/36))
    - For the networks-status object
    - May provide some challenges related to reference CNI plugins (such as ptp)
    - May need changes to net-attach-def spec, as well as cni spec itself
      * "Multiple interfaces in one result" -- previously there was a conversation about this in the past. Tomo recalls that Dan Williams had commentary on it.
    - In the case of SRIOV CNI, CNI doesn't see the access to many networks in parallel.
    - Semantic change to the networks-status object is that previously we have had each element map to "a network attachment" and this would change each element mapping to "a network interface"
    - Additionally, there's a kind of "factory" type implementation here where a single attachment creates a number of interfaces.
      * Group of L2s that get created on the same attachment point.
    - 
  + What about the naming convention?
    - Does it care about net1,net2,...,netN
    - Or does it need net1.42,net2.43,...,net2.N
    - Per brings up hashing the networking names in kactus, the 15 chars wasn't enough.
  + Possible next steps
    - Outline usecase in generic terms (useful for other cases that are not purely OVS CNI)
      * Billy mentions challenge passing information in device info spec
    - Present to the CNI maintainers?
    - Is there a stop-gap we can use here to allow for this use case -- in reconciliation with the current state of CNI spec and what we can do with the multi-net-spec
      * one idea: what about a "subinterfaces" object inside each element in the networks-status list[]? And embed/pack those in some return element that multus can parse (instead of multiple results)?

## May 6th, 2021

**Attendees:** Dan Williams (RH), Tomofumi Hayashi (RH), Maciej Skrocki (Google), Gary Loughnane (Intel),Dimitrios Markou (EST), Kedar Kulkarni(RH), Per Andersson(Kaloom)

* Regular business
  + Member Candidates
  + Maintainer Candidates
    - Reference Deployments
      * Jeff d'ambly (Netskope, Inc)
  + Project Candidates
* [mskrocki] SR-IOV Operator
* [Tomo] Troubleshooting ideas?

## April 22nd, 2021

**Attendees:** Dan Williams (RH), Doug Smith (RH), Tomofumi Hayashi (RH), Dimitrios Markou (EST), Ivan Kolodiazhnyi (Nvidia),Maciej Skrocki (Google), Gary Loughnane (Intel), Shane Utt (Kong), Patryk Strusiewicz-Surmacki (Intel), Abdallah Chatila (Kaloom), Suresh Krishnan (Kaloom)

* Regular business
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
* [Doug] [Dynamic attached Considerations outline document](https://docs.google.com/document/d/1Fb7t7h3Yg2x4tzjJZwDSnN1R77y93sAX1YobaMsdaXE/edit#)
  + Generated from discussion from last session
  + Probably biggest consideration is that we'll need to define what to do for persistence -- this is the trickiest consideration we've encountered yet
    - For next session, let's review what we have discussed in the doc.
    - Could potentially move forward with a KEP for changing daemonset/deployment behavior in tree.
  + Still rather raw.
  + Please feel free to edit in place, or add comments.

## April 8th, 2021

**Attendees:** Maciej Skrocki (Google), Tomofumi Hayashi (Red Hat), Adrian Chiris (Nvidia), Peter White (Microsoft), Gary Loughnane (Intel), Ivan Kolodiazhnyi (Nvidia), Peri (EST), Patryk Strusiewicz-Surmacki (Intel), Dimitrios Markou (EST), Suresh Krishnan (Kaloom), Doug Smith (Red Hat), Abdallah Chatila (Kaloom)

* Regular business
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
* [Doug] Could the \*/networks-status annotation be improved to capture a better set of results?
  + This Multus issue kind of pointed out to me that the default-route entry is, kind of limited. Seeing it's only set when it's set through the network selection annotation.
    - And well, this is a true result of what we did.
  + Could it be improved to have kind of a snapshot of the CNI results that captured more broadly "default gateway" (whatever it was)
  + Could this feed into CNI 2.0? Make all of these elements more easily accessible?
    - Could more information be available, could it track dynamic attributes?
  + Currently, this does come from the CNI results object, and it's just gathering the CNI delegates output.
    - Next consideration -- what about dynamic? It becomes slippery when there's a thick plugin and properties can change during runtime (or say in a NET\_ADMIN capable pod)
* [Doug] Document for tracking requirements for dynamic attachments
  + Let's start a google doc!
    - TODO: Doug and Tomo to stub it out and share with group
  + Benefits / considerations
    - Entrypoint is bloated and difficult to maintain
      * Multus maintainers to further discuss the feasibility of refactoring the current entrypoint as a go code, need to discuss trade of in terms of complexity.
    - Kubeconfig
      * Kube ca rotation will be better handled
    - Logging
      * Afforded some improvements
    - Devices with resources
      * Allocated by DP and bookkeeping by kubelet
    - Simple JSON verification
      * (might already be covered)
      * <https://github.com/k8snetworkplumbingwg/net-attach-def-admission-controller>
    - UX considerations (CNI configs aren't always easy)
    - How to make it persistent -- if the pod gets scheduled, it has the same attributes
      * When the pod is defined by a higher level method, e.g. daemonset, replicaset.
      * So \*/networks = foo,bar,quux, but originally defined as \*/networks = foo (and two networks were added). So when it restarts, how do we get it back to foo,bar,quux.
      * Kactus knows that it's a deployment, and it stashes the info and then can update it as such.
      * Dynamic attachment custom resource and a selector of some variety?
* [Tomo] kubectl-multinet is in krew (kubectl plugin package collection)
  + <https://krew.sigs.k8s.io/plugins/>

## 

## March 25th, 2021

**Attendees:** Dan Williams (Red Hat), Tal Liron (Red Hat), Billy McFall (Red Hat), Doug Smith (Red Hat), Peter White (Microsoft), Per Andersson (Kaloom), Abdallah Chatila (Kaloom), Tomofumi Hayashi (Red Hat)

* Regular business
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
    - [multusctl](https://github.com/tliron/multusctl) [Tal]
      * Should it be its own repository or directly integrated into the Multus codebase?
        + Tomo notes examples where \*ctl (istioctl, kubectl) utilities are versioned separately from the core projects.
      * Generally decided that multusctl will be its own repository, this likely makes sense from a dependencies perspective, as well as a binary distribution perspective.
      * Deferred to next week (no quorum)
* [Tomo] Q: Does anyone use multi-NetworkPolicy?
* [Doug] Multus dynamic attachments
  + Recently had a re-presentation from Abdallah (thank you!) to refresh our memories and learn from the experience.
  + Hoping to make some forward movement on this in the coming months.
* [Per] Network Semantics presentation (to be presented in a future meeting)

## March 11th, 2021

**Attendees:** Adrian Chiris(Nvidia), Tomofumi Hayashi (Red Hat), Per Andersson (Kaloom), Doug Smith (Red Hat), Abdallah Chatila (Kaloom), Maciej Skrocki (Google), Ivan Kolodiazhnyi (Nvidia), Peter White (Microsoft), Dave Cremins (Intel)

* Regular business
  + Member Candidates
    - Chris Randles (Comcast)
  + Maintainer Candidates
    - Chris Randles - Whereabouts
    - Doug Smith Whereabouts
    - Tomofumi Hayashi - cni-route-override (to be in npwg)
  + Project Candidates
* [Dave] multus-cni is now in NPWG!!
  + Next steps for Multus
    - Move the container image to GH container registry
      * Does this require a login to the GH container registry?
        + Tomo believes that images that are marked public should not require login to pull.
        + A quick validation from Tomo looks like that is the case, that a login is not required.
      * <https://docs.github.com/en/packages/guides/pushing-and-pulling-docker-images#authenticating-to-github-container-registry>
* [Tomo] kubectl-podnet -> kubectl-multinet
  + <https://github.com/k8snetworkplumbingwg/kubectl-multinet>
  + changed name due to <https://krew.sigs.k8s.io/docs/developer-guide/develop/naming-guide/>
  + Updates reflected in README, there's some formatting for the "-o wide" mode that provides additional metadata (including the namespace)
  + v0.2 has been released.

## February 25th, 2021

**Attendees:** Maciej Skrocki (Google), Tomofumi Hayashi (Red Hat), Gary Loughnane (Intel), Adrian Chiris (Nvidia), Doug Smith (Red Hat), Peter White (Metaswitch / Microsoft), Geoffrey Lefebvre(Kaloom), Patryk Strusiewicz-Surmacki (Intel), Ivan Kolodiazhnyi (Nvidia), Abdallah Chatila (Kaloom), Dave Cremins (Intel), Per Andersson (Kaloom)

* Regular business
  + Member Candidates
  + Maintainer Candidates
  + Project Candidates
* [Adrianc] [multus CNI](https://github.com/intel/multus-cni) - There were plans to move the project to NPWG/CNCF ? was there progress on this front ?
  + Proposal for CNCF?
    - ...Which
  + Last update from Dave Cremins, they've made forward progress, however there's some internal processes that need to be completed for orchestrating the hand off.
    - And Dave confirms that hand off will be to the NPWG.
* [Adrianc] [whereabouts](https://github.com/dougbtv/whereabouts) - Are there plans to move to k8snetworkplumbingwg ?
  + Yes. Doug needs to speak with co-maintainer to get him to join the NPWG.
  + Also, happy to get any contributions, or input during the Multus maintainers meeting
* [Tomo] kubectl-podnet is in k8snpwg repo!
  + <https://github.com/k8snetworkplumbingwg/kubectl-podnet>
  + "All the bells and whistles type deployment" in reference deployments?
    - Could be used in some of the introductory materials
    - Tomo notes that some the items don't all run in cluster
    - Maybe similar timing to youtube / website materials
* [Doug] Dynamic attachments discussion from [Tuesday additional discussion agenda](https://docs.google.com/document/d/129FUXBHvKMOVwsvjgYzZX4CorsN_uJwHTdo8DXs1Tpk/edit#heading=h.z9zubui0zsju)
* [Gary] Update on move to vendor neutral container registry
  + example:
    - <https://github.com/k8snetworkplumbingwg/multi-networkpolicy-iptables>
    - <https://github.com/orgs/k8snetworkplumbingwg/packages?repo_name=multi-networkpolicy-iptables>
  + We have provisionally chosen the GitHub container registry, Tomo has updated GitHub actions to push images for multi-networkpolicy-iptables as a hands-on trial.
  + Resource Management group working to move container registry references and builds. SR-IOV network operator is the first target.
    - Note(adrianc): This is something **i'm planning** to bring up on next meeting (upcoming Monday) so first target might change.

## February 11th, 2021

**Attendees:** Dan Williams (RH), Per Andersson (Kaloom), Maciej Skrocki (Google), Tomofumi Hayashi (RH), Suresh Krishnan (Kaloom), Dimitrios Markou (EST), Billy McFall (Red Hat), Adrián Moreno (Red Hat), Peter White (Metaswitch / Microsoft), Patryk Strusiewicz-Surmacki (Intel), Adrian Chiris (Nvidia), Abdallah Chatila (Kaloom)

* Regular business
  + Member Candidates
  + Maintainer Candidates
    - kubectl-podnet: Tomofumi Hayashi, Doug Smith
  + Project Candidates
    - kubectl-podnet [Tomo]
      * Parses network-status annotation and gives overview of attributes based on results from metaplugin attachment of additional networks.
        + Optional Device-Info fields not currently parsed. Sample annotation: [annotations\_deviceinfo\_pci](https://github.com/openshift/app-netutil/blob/master/samples/annotations/annotations_deviceinfo_pci)
* Agenda
  + [Doug] Protobuf updates for repos
    - Just a PSA that each project we have that vendors the k8s libraries should likely update for this protobuf CVE.
    - "The skippy peanut butter issue": <https://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2021-3121>
  + [Tomo] Container Registry updates
    - See update (BOLD) of Feb 1st
    - Which one is better?
      * Quay (GAed service)
      * Github Container Registry (beta)
  + [Doug] NPWG - Logo
    - [Logo ideas](https://docs.google.com/drawings/d/15Ke4DY6q9DRaPCpSu5i1OE_uQZOCKvQXHnSuEFMuAW0/edit?usp=sharing)
    - Anyone else want to contribute ideas and we can look at them as a whole?
    - Figured could be useful as part of the effort for a cohesive introductory web page (and other materials Tomo has been discussing such as some youtube videos)
  + Question Dimitris
    - Whereabouts - DNS
      * DNS configuration didn't take?
        + New issue for tracking: <https://github.com/dougbtv/whereabouts/issues/87>
    - Tomo notes that you can specify multiple nameservers, but only one is used. So if Server A (first line) is available, then it always uses Server A.
      * Should we have docs
    - Tomo mentions this brings up the question: How should DNS be managed in a multi-network case?
      * Previous behavior that first DNS is always used, this is implicity the rules, in the linux/unix network, not container specific.
      * If multiple DNS servers are in one result object -- the CNI spec doesn't go into further than "this shows up in resolv.conf"
      * Per network DNS / split DNS -- you'd need some local caching nameserver that's specific to a container
      * Dan mentions this idea where you could have DNS sent to 127.0.0.1 and something that intercepts it and sends it another DNS server.
    - Tomo notes this brings up two issues:
      * How to manage one resolv.conf from multiple CNI invoking, or we specify the behavior resolv.conf in CNI explicitly
        + Could be handled in the CNI 2.0 specification.
        + Or the NPWG spec, since that's what talks about combining network information (like routes, etc)
      * Imagine two or more DNS servers (coreDNS, dnsmasq, etc), use pattern matching to change DNS query.
        + Regarding coreDNS, all containers will have assigned IP address (well, if not L2), you could image that all goes to coreDNS, and have coreDNS know the source ip and, then you could have some rules for some domains go to one or another DNS server.

## January 28th, 2021

**Attendees:** Tomofumi Hayashi(Red Hat), Peter White (Metaswitch/Microsoft), Maciej Skrocki (Google), Doug Smith (Red Hat), Per Andersson (Kaloom), Dan Williams (Red Hat), Patryk Strusiewicz-Surmacki (Intel), Billy McFall (Red Hat), Adrian Chiris (NVIDIA), Peri (EST), Abdallah Chatila (Kaloom)

* Regular business
  + (none this week)
* Agenda
  + Container Registry updates?
    - ...we blew the Dockerhub limits for a free account for Multus & SR-IOV images (!) (not actually the case, turned out to be just a pull limit from an anonymous account)
    - Github supports multi-arch at lat Sep.
      * Doug and Tomo to follow up with some trials and report back.
      * **Update (at Feb 1st):**
        + **Github offers two container registry service, GitHub Container Registry (i.e. ghcr.io, public beta, need to make it beta service) and Package registries (docker.pkg.github.com)**

**Official page for difference between both** [**https://docs.github.com/en/packages/guides/about-github-container-registry#about-github-container-registry**](https://docs.github.com/en/packages/guides/about-github-container-registry#about-github-container-registry)

* + - * + **Multi-arch supports only in ghcr.io**
        + **Concern: Github Container Registry is currently beta so we can use it as free, but no information about GA…**
  + Service Abstraction
    - Doug mentions the current "state of the union" for the service abstraction PoC, for Tomo's current PoC -- it's in need of updates for endpointslices (which have become favored since the advent of his PoC)
    - On SIG Network mailing list has some interesting topics about additional IP addresses, and may require an additional field in the pod status.
      * Thread "pod.Status.PodIPs isn't extensible without an API break?"
      * Pod.status.podip -- this was extended in 1.18 for dual stack, to create an additional Pod.status.podip, which was a list of structs with at least one field.
      * Idea was to extend that struct, and then add labels to connect the dots between CRI, kubelet, and Multus, however, it's limited to one v4 and v6.
      * Per brings up, what about overlapping IPs? (Or as he mentions, "IP domains"). Which requires two routines, pod-to-address, and then for filters you need address-to-pod.
        + Per has some slides together for this, however Dan mentions that hasn't come up in relation to this discussion.

## January 14th, 2021

**Attendees:** Martin Kennelly (Intel), Maciej Skrocki (Google),Petr Horacek (Red Hat), Peri (EST), Doug Smith (Red Hat), Billy McFall (Red Hat), Adrian Chiris (Nvidia), Michael Cambria (Red Hat), Peter White (Metaswitch / Microsoft) Per Andersson (Kaloom), Zenghui Shi (Red Hat), Dimitrios Markou (EST), Shane Utt (Kong), Suresh Krishnan (Kaloom), Tomofumi Hayashi(Red Hat), Abdallah Chatila (Kaloom)

* Regular business
  + NPWG Member Candidates
    - Petr Horacek [Red Hat]
  + NPWG Maintainer Candidates
    - Periyasamy Palanisamy (Ericsson Software Technology)
      * <https://github.com/k8snetworkplumbingwg/network-resources-injector>
    - Petr Horacek
      * ovs-cni
      * Net-attach-def client library.
    - Martin Kennelly (Intel)
      * SRIOV Operator
        + Contributor and maintainer of Network Resources Injector / SRIOV CNI & SRIOV DP.
  + NPWG Project Candidates
    - OVS CNI
      * <https://github.com/kubevirt/ovs-cni>
      * This plugin allows user to define Kubernetes networks on top of Open vSwitch bridges available on nodes. This project also delivers OVS marker, which exposes available bridges as Node resources, that can be used to schedule pods on the right node via [intel/network-resources-injector](https://github.com/intel/network-resources-injector/)
      * Used across a number of organizations.
    - IB SR-IOV CNIw (Infiniband SR-IOV CNI)
      * <https://github.com/Mellanox/ib-sriov-cni>
      * This CNI enables k8s secondary network over Infiniband VF
      * Vendor agnostic, Supported by sriov-network-operator and Openshift.
    - All of the above accepted!
    - **TODO Doug**: Update community repo
  + Pull Requests
    - Doug merged [Nvidia member s added to community repo PR](https://github.com/k8snetworkplumbingwg/community/pull/10).
* [Doug/tomo] New container registry namespace
  + Docker.io
    - Pros: most famous
    - Cons: new image retention policy will make something to us
      * <https://www.docker.com/blog/docker-hub-image-retention-policy-delayed-and-subscription-updates/>
  + github/packages?
    - <https://docs.github.com/en/free-pro-team@latest/packages/guides/about-github-container-registry>
    - pros: everything in github
    - Todo:
      * need to check multi arch support
      * need to check price plan (free for Open Source!)
  + Quay.io?
    - Pros:
      * multi arch support
    - Cons: ?? (no big concerns?)
  + GCR - Google Cloud Registry
    - <https://cloud.google.com/container-registry/>
    - May require a subscription.
    - $ for storage/bandwidth
  + Any suggestions?
  + TODO: Tomo will return next session with more complete information and we'll vote and start creating accounts / getting people setup to push to the new registry namespace.
* [Tomo] Top web page for NPWG?
  + Short intro -- 17repos (!!)
  + Example: <https://www.cni.dev/> <https://github.com/containernetworking/cni.dev>
  + Volunteers to help write an intro and description for introductions?
    - Doug Smith
    - Billy McFall
    - Martin Kennelly (For gdoc inclusion: martin.kennelly at intel.com)
  + Next step: start a google doc to collect content?
  + NPWG graphic (would be nice)
  + We should have a TLD!
    - Let's brainstorm some TLDs in the doc, and we'll bring it back to the group.
* [Tomo] Additional meeting slots
  + Every other week (from this meeting)
  + [Agenda and connection info](https://docs.google.com/document/d/17-vkuoObBFBb6feXNA7tjTaKr-rs8ea0VTnqvlEdCv8/edit#)
  + <https://github.com/k8snetworkplumbingwg/community#topic-specific-meetings>
* [Doug] Other topics that are kind of brewing…
  + Multus CNI as a thick plugin / resident daemon architecture
  + Service Abstraction -- k8s service objects for secondary networks

**NO MEETING DECEMBER 31st**

## December 17th, 2020

**Attendees:** Doug Smith (Red Hat)**,** Adrian Chiris(Nvidia), Dan Williams (Red Hat), Federico Paolinelli (Red Hat), Sebastian , Scheinkman (Red Hat), Tomofumi Hayashi (Red Hat), Peri (EST), Dimitrios Markou (EST), Aaron Smith (Red Hat), Patryk Strusiewicz-Surmacki (Intel), Peter White (Metaswitch / Microsoft), Billy McFall (Red Hat)Per Andersson (Kaloom)

* Regular business
  + NPWG Member Candidates
  + NPWG Maintainer Candidates
    - Sriov network operator - Sebastian Scheinkman (SchSeba) / Federico Paolinelli (fedepaol)
      * Accepted
  + NPWG Project Candidates
  + Pull Requests
    - Doug merged [Nvidia member s added to community repo PR](https://github.com/k8snetworkplumbingwg/community/pull/10).
* [Doug] Service Abstraction
  + Raw notes from Multus maintainer's meeting.
    - Martin and his team are looking to converge the interfaces into native Kubernetes. Looking at the net-attach-def controller, and a race with the endpoint controller (related to service abstraction)
      * Tomo notes the changes to the kube proxy wouldn't be accepted upstream as the net-attach-def is not recognized.
      * Tomo mentioned the prototyping for the endpoints/endpointslices (endpointslices to do)
      * <https://github.com/kubernetes/kubernetes/blob/master/pkg/proxy/apis/well_known_labels.go#L22>
      * Tomo's plan is to make no changes to k/k and use the well known labels to prevent Kubernetes from adding the iptables rules.
      * 3 months ago, this worked just fine, however, now endpointslices are favored, and this will need to be verified at this point in time (and there's some work to do)
      * Martin notes that the scheduler has extensibility, and he asks the question: can you make it so that endpoints are extensible? (I believe there's some rethinking of this after the above conversation)
    - Tomo's previous POC modified Kubernetes proper.
    - Tomo is now prototyping the next version, implementing an endpoint controller. Upstream has moved to use endpointslices. So the code will need some changes.
    - Tomo is planning to utilize iptables as multi-netpolicy does.
    - Tomo is planning on extrapolating on the architecture and design.
      * However the focus for now is on the multi-netpolicy, which Tomo has prioritized.
    - Selectors on multiple IP addresses? Still workable or not?
      * With dual stack we have the capability for multiple IPs, and this was made extensible so we can add fields in the future.
      * There's a couple issues that are being worked in sig-network.
      * Multiple ips means from the primary and also Multus?
        + Right now with API server, restricts the pod IPs to two -- v4 & v6.
        + Labels on both IPs, and that would be conveyed from CNI into the runtime, and the runtime sends those to kube.

If each of those IPs had labels, you could set the label to the net-attach-def name.

Then you could have services that have pod IP selector, and that service says "I only want to select network endpoints with name $foobar"

* + - * + Per notes you need some dynamic capability to detect changes in the IPv6 scenarios.

Address assignment has to be mutable.

* + - * + Dan notes there are some possibilities brewing for enabling this.
      * Per has some slides that are in work, and they deal with needs for VRFs and orchestration and what not. Could be presented at the end of January.
      * If we have dynamic attachments, we could look into using CNI CHECK (possibly)
        + There is a lot of road ahead for dynamic attachments.
        + Per: "multihoming looks easy, but it's not" (Doug: I think we can all agree with that!)
      * Dan notes that gRPC for CNI v2 (for example) could handle the two-way communication during pod lifecycle.

## 

## December 3rd, 2020

**Attendees:** Martin Kennelly (intel), Dan Williams (Red Hat), Billy McFall (Red Hat), Tomofumi Hayashi (Red Hat), Michael Cambria (Red Hat), Suresh Krishnan, Maciej Skrocki (Google) (Kaloom),Hanamantagoud(EST), Doug Smith (Red Hat), Peter White (Metaswitch / Microsoft), Peri (EST)

* Regular business
  + NPWG Member Candidates
  + NPWG Maintainer Candidates
    - Network Resources Injector (italicized added by Doug)
      * *Abdul Halim (Intel)*
      * *Martin Kennelly (Intel)*
      * *Killian Muldoon (Intel)*
      * *Zenghui Shi (Red Hat)*
      * *Peng Liu (Red Hat)*
      * No objections.
  + NPWG Project Candidates
  + Pull Requests
    - [Pull Request](https://github.com/k8snetworkplumbingwg/community/pull/9): Updates to community repo to update members & maintainers, as well as add additional meeting info.
      * Just need a review / merge.
    - [Multi-net-spec pull request](https://github.com/k8snetworkplumbingwg/multi-net-spec/pull/9): Updates to version 1.2
      * Also just needs a review / merge.
* SR-IOV Network Operator
  + TODO: Doug sync up with Zenghui and Peng for an update.
  + Also a note that it does operate with vanilla kubernetes! (this has been tested by Martin, thanks Martin)
* Multus CNI Dynamic attachments [Doug]
  + Topic is coming up again (...as if Kaloom will be surprised! They've been doing this for ~3 years!)
  + Possibility of changing Multus to be a thick-plugin architecture to support this (e.g. shim CNI plugin + long-running process)
    - Additional benefit: Having the daemon-style pod, the thick part, could run in a pod and could enable some better logging for troubleshooting.
    - Also would enable caching of the pod annotations and network CRs, reducing network attachment latency and number of apiserver calls
  + What would the mechanism be to request / change a dynamic attachment?
    - [dcbw] change in pod annotations?
  + What about the possibility of Multus becoming a CRI-compatible run-time feature?
    - [dcbw] what would benefits of this be rather than the library approach where that library gets used from CRI-O or other runtimes?
  + What happens with CNI 2.0? Would this have overlap there?
    - [dcbw] yes, there certainly could be
  + How does the application (running in a pod) know about a newly added interface?
    - Suresh notes that in the kaktus case the workloads are already in-the-know about the fact that there could be a new interface.
    - [mcc] bind() to 0.0.0.0 ? Known static IP
    - [dcbw] process can also watch netlink. eg, I think the process in the pod has to have some knowledge of dynamic interfaces[
  + Downward API -- the annotations are available, but do they update dynamically?
    - TODO: Doug to take a look.
    - Peter notes that they do, but, there's a number of seconds delay.
      * Billy has the same recollection.
  + Next steps: Let's sync with Abdallah about Kactus and learn about the lessons learned there.
    - In two meetings time we can get Abdallah on the call
* Next couple meetings
  + Dec 17th - will be held
  + Dec 31st - canceled

## November 19th, 2020

**Attendees:** Dan Williams (Red Hat), Maciej Skrocki (Google),Michael Cambria (Red Hat), Gary Loughnane (Intel), Per Andersson (Kaloom),, Adrian Chiris (Nvidia), Doug Smith (Red Hat), Peter White (Metaswitch / Microsoft), Dave Cremins (Intel), Billy McFall (Red Hat), Aaron Smith (Red Hat), Suresh Krishnan (Kaloom)

* Regular business
  + NPWG Member Candidates
  + NPWG Maintainer Candidates
  + SR-IOV Network Operator
    - Approved! Doug will create the repository.
* [Billy] Advertisement: “K8s Network & Resource Management” meeting
  + SR-IOV Network Device Plugin & CNI, SR-IOV Network Resource Injector, SR-IOV Operator, App-NetUtil, Userspace CNI
  + Every other Monday, 15:00 - 16:00 GMT / 10:00-11:00 ET / 07:00-08:00 PST
  + Next Meetings: 11/23/2020, 12/07/2020
  + Agenda Doc: [K8s NPWG Network & Resource Mgnt Projects Agenda](https://docs.google.com/document/d/1sJQMHbxZdeYJPgAWK1aSt6yzZ4K_8es7woVIrwinVwI/edit#)
  + **~~Action Doug~~**~~: Add to community repo~~
* [Doug] Additional discussion meeting (primarily discussing additional Networkpolicy) cancelled for next week (due to Thanksgiving in the USA, as well as Tomo's absence)
  + We'll have the next meeting on Dec 8th @ 10:30am Eastern
* [dcbw] CNI next
  + Casey and CNI maintainers discussing what the next version of CNI should look like
  + Similar to discussions upstream in Kubernetes about a "Networking API"
  + Impacts this group since much of our work is CNI-related
* [Dave] Network Resource Injector moving into the NPWG
  + (Already approved)

## November 5th, 2020

**Attendees:** Dan Williams (Red Hat), Maciej Skrocki (Google), Billy McFall (Red Hat), Gary Loughnane (Intel), Moshe Levi(Nvidia), Adrian Chiris(Nvidia), Peter White (Metaswitch/Microsoft), Vivek Thrivikraman (EST),Hanamantagoud(EST), Aaron Smith (Red Hat), Adrian Moreno (Red Hat), Per ANdersson (Kaloom), Suresh Krishnan (Kaloom), Doug Smith (Red Hat)

* Regular business
  + NPWG Member Candidates
  + NPWG Maintainer Candidates
  + SR-IOV Network Operator [Punted from last session]
    - The SR-IOV Network Operator provides an integration of the SR-IOV components with an opinionated lifecycle management of those under Kubernetes.
    - <https://github.com/openshift/sriov-network-operator>
    - How will we handle the changes for upstream k8s compatibility / what's necessary / what are we going to change?
* [Doug] Spec editors? Who should be able to edit / approve spec changes?
  + Doug suggests that it be github org owners? Seems OK
  + TODO: Doug will add those as editors to the doc (with Dan)
    - Doug: Used the "asked to share button"
  + Doug update the markdown lists of members / maintainers / etc
* What should spec version 1.2 constitute?
  + We have added
    - Device-info-spec
    - Infiniband
    - Namespace in selection annotation items
  + Probably enough to constitute a 1.2
    - Vote? All yes.
  + What constitutes a bump in revision, generally?
    - Maybe this should be formalized, or, gut instinct.
  + TODO: Doug to update the github repo / generate the new docs.
* [Billy] Device-Info-Spec Update
  + Spec merged: <https://github.com/k8snetworkplumbingwg/device-info-spec>
  + PR to add DeviceInfo to NetworkStatus definition: [network-attachment-definition-client PR#29](https://github.com/k8snetworkplumbingwg/network-attachment-definition-client/pull/29)
    - Adds data structures and helper methods.
    - [Doug] I realized that we don't have any tagged version of the client library. I think we should probably tag it before we change params for a public function.
      * Any input on what version to use to start? v1.1.0 sound OK?
      * Doug will tag a version. (Done)
  + PR to write DeviceInfo to NetworkStatus: [multus-cni PR#577](https://github.com/intel/multus-cni/pull/577)
* [Doug] Merge robot suggestions?
  + Doug is going to start looking into automated merge robots
  + Currently, the plan is to look into GitHub actions to do this, and create a basic action that essentially says "If the tests pass, and we have [some labels / condition for acceptance] then, merge it"

## October 27th, 2020 (additional meeting)

See <https://docs.google.com/document/d/129FUXBHvKMOVwsvjgYzZX4CorsN_uJwHTdo8DXs1Tpk/edit?ts=5f886e49#>

## October 22nd, 2020

**Attendees:** Dan Williams (Red Hat), Abdul Halim(Intel), Michael Cambria(Red Hat)

Adrian Chiris(Nvidia), Moshe Levi(Nvidia), Doug Smith (RH), Billy McFall (Red Hat), Suresh Krishnan (Kaloom), Ryan Tidwell (SUSE), Maciej Skrocki (Google), Hanamantagoud(EST), Adrián Moreno (Red Hat) , Dave Cremins (Intel), Vivek Thrivikraman(EST), Zenghui Shi (Red Hat)

* + Regular business
    - NPWG Member Candidates
      * Zenghui Shi (Red Hat)
      * Peng Liu (Red Hat)
    - NPWG Maintainer Candidates
      * Zenghui Shi (Red Hat) @zshi-redhat
        + <https://github.com/k8snetworkplumbingwg/sriov-cni>
        + <https://github.com/k8snetworkplumbingwg/sriov-network-device-plugin>
        + (+ SR-IOV Network Operator)
      * Peng Liu (Red Hat) @pliurh
        + <https://github.com/k8snetworkplumbingwg/sriov-cni>
        + <https://github.com/k8snetworkplumbingwg/sriov-network-device-plugin>
        + (+ SR-IOV Network Operator)
      * Moshe Levi (Nvidia)
        + <https://github.com/k8snetworkplumbingwg/sriov-cni>
        + <https://github.com/k8snetworkplumbingwg/sriov-network-device-plugin>
        + (+ SR-IOV Network Operator)
      * Adrian Chiris (Nvidia)
        + <https://github.com/k8snetworkplumbingwg/sriov-cni>
        + <https://github.com/k8snetworkplumbingwg/sriov-network-device-plugin>
        + (+ SR-IOV Network Operator)
    - NPWG Repository Proposals
      * SR-IOV Network Operator [Punted to next session]
        + The SR-IOV Network Operator provides an i ntegration of the SR-IOV components with an opinionated lifecycle management of those under Kubernetes.
        + <https://github.com/openshift/sriov-network-operator>
  + [Doug/Billy] Spec Updates for Device Info
    - Billy has suggested updates in the [v1.1 doc](https://docs.google.com/document/d/1Ny03h6IDVy_e_vmElOqR7UdTPAG_RNydhVE1Kx54kFQ/edit)
      * Needs to have the changes accepted
      * [dcbw] Accepted
    - Shall we bump to version 1.2?
      * AI: discuss next time
    - FYI - Device-Info-Spec conversion from approved doc to Markdown (comments welcome):
      * <https://github.com/k8snetworkplumbingwg/device-info-spec/pull/1>
  + [Adrianc] Are there plans to move whereabouts IPAM plugin to npwg ?
    - <https://github.com/dougbtv/whereabouts>
    - [Doug] We voted it in a couple sessions ago! I need to move it, but, I need to coordinate with my primary contributors to join.
  + [Dave C] NPWG Roadmap - what do we want to drive?
    - [Doug] I would say that maybe focusing energy on service objects would be practical for a short term
    - [Doug] There's also a discussion going on among the industry about "a Networking API for Kubernetes"
      * This constitutes a number of things, there's been a conversation going on about this that came out of
      * My own opinion is that some kind of orchestration of net-attach-defs might make for more of a macro method to
  + [Tomo] cannot make the call today but let me notice that next Tuesday we'll have a meeting to discuss NetworkPolicy on secondary interfaces. Please see my email sent to npwg mailing list (or google group)
    - <https://github.com/k8snetworkplumbingwg/multi-networkpolicy-iptables>

## 

## October 8th, 2020

**Attendees:** Doug Smith (Red Hat), Maciej Skrocki(Google), Tomofumi Hayashi (Red Hat), Kural (Intel), Ritu (Intel), Per Andersson (Kaloom), Dan Williams (Red Hat), Abdul Halim (Intel), Adrian Chiris (Nvidia), Maxime Coquelin (Red Hat), Adrián Moreno (Red Hat), Suresh Krishnan (Kaloom), Ryan Tidwell (SUSE), Billy McFall (Red Hat), Aaron Smith (Red Hat), Dave Cremins (Intel),Hanamantagoud (EST),Vivek Thrivikraman(EST), Michael Cambria (Red Hat), Dimitrios Markou (EST)

* + Tomo will talk about my topics below first
  + Regular business
    - Meeting is passcode protected now: 77777
    - NPWG Maintainer Candidates
      * Abdul Halim (Intel) @ahalim-intel
        + Abdul is a long-standing maintainer of both of these repositories.
        + <https://github.com/k8snetworkplumbingwg/sriov-network-device-plugin>
        + <https://github.com/k8snetworkplumbingwg/sriov-cni/>
      * Martin Kennelly (Intel) @martinkennelly
        + [k8snetworkplumbingwg/sriov-network-device-plugin: SRIOV network device plugin for Kubernetes](https://github.com/k8snetworkplumbingwg/sriov-network-device-plugin)
        + <https://github.com/k8snetworkplumbingwg/sriov-cni/>
      * Killian Muldoon (Intel) @killianmuldoon
        + [k8snetworkplumbingwg/sriov-network-device-plugin: SRIOV network device plugin for Kubernetes](https://github.com/k8snetworkplumbingwg/sriov-network-device-plugin)
        + <https://github.com/k8snetworkplumbingwg/sriov-cni/>
      * No objections; maintainers accepted.
    - Community updates
      * Pull request to add new docs for members, maintainers, owners @ <https://github.com/k8snetworkplumbingwg/community/pull/8>
        + Needs a review / lgtm / merge.
    - SR-IOV Device Plugin & SR-IOV CNI Plugin have been transferred!
    - We'll add Bond CNI & Userspace CNI for vote for the next session.
    - Still pending: Mailing list solution for the code of conduct
  + Topics
    - [Tomo] Additional meeting for discussion time slot is fixed
      * Thank you for your voting!
      * Timeslot is 2:30PM-3:30PM (UTC) Tuesday (bi-weekly, opposite week of this meeting = same week of SIG-Network)
      * Next item (Tomo will do):
        + List up agenda (current TODO topics)
        + Double check meeting URL (can we use this one for it?)

Need to have another zoom URL

* + - * When will we start?
        + Oct 20 -> Oct 27 (20 is the week of this one!)
    - [AdrianM / Billy] Device Information Spec
      * [Proposal document](https://docs.google.com/document/d/1rBm-L1ymXIjoKNA6w2lixwBAjt9-tnbs-ee7AcLRbVE/edit#heading=h.1bflt0ii8e9d)
      * Summary of changes:
        + Added “version” field in the device information format (MAJOR.MINOR.PATCH format) and the Spec itself
        + Addressed some minor comments (Thanks to all)
        + There is a comment to add “mdev” device information. Since it’s quite late, the suggestion is to vote on the Spec as-is and then enhance it with the new devicetype.
      * Voting
        + No objections; proposal accepted
    - [Doug/Kural] OVN4NFV K8s Plugin
      * Kural email the list and introduced these projects
      * <https://github.com/opnfv/ovn4nfv-k8s-plugin>
      * Service Function Chaining(SFC) implementation with SDEWAN controller demo here - <https://github.com/opnfv/ovn4nfv-k8s-plugin/tree/master/demo/sfc-setup>
      * SDEWAN CNFS and controller framework - <https://github.com/akraino-edge-stack/icn-sdwan/tree/master/platform/crd-ctrlr>

## September 24th, 2020

**Attendees:** Martin Kennelly (Intel), Dan Williams (RH), Doug Smith (RH), Tomofumi Hayashi (RH), Ryan Tidwell (SUSE), Jaime Caamaño (SUSE), Per Andersson (Kaloom), Adrian Chiris (Nvidia), Dimitrios Markou (EST), Suresh Krishnan (Kaloom), Adrian Moreno (Red Hat), Periyasamy Palanisamy (EST), Billy McFall (Red Hat), Dave Cremins (Intel),, Moshe Levi (Nvidia), Maciej Skrocki (Google),Peter White (Metaswitch), Michael Cambria(RH)

* Regular business
  + NPWG Member Candidates
    - Doug Smith (Red Hat)
    - Tomofumi Hayashi (Red Hat)
    - Killian Muldoon (Intel)
    - Adrian Chiris (Nvidia)
    - Martin Kennelly (Intel)
    - Billy McFall (Red Hat)
    - Dave Cremins (Intel)
    - Per Andersson (Kaloom)
    - Suresh Krishnan (Kaloom)
    - Abdallah Chatila (Kaloom)
    - Zenghui Shi (Red Hat)
    - Peng Liu (Red Hat)
    - Gary Loughnane (Intel)
    - Abdul Halim (Intel)
    - Adrián Moreno (Red Hat)
    - Emma Kenny (Intel)
    - Moshe Levi (Nvidia)
    - Dan Williams (Red Hat)
    - Maciej Skrocki (Google)
    - Peter White (Metaswitch)
    - Vote: all in favor, none opposed. Membership accepted.
  + NPWG Maintainer Candidates
    - Doug Smith (Red Hat)
      * <https://github.com/k8snetworkplumbingwg/reference-deployment>
      * <https://github.com/k8snetworkplumbingwg/multi-networkpolicy-iptables>
      * <https://github.com/k8snetworkplumbingwg/multi-networkpolicy>
      * <https://github.com/k8snetworkplumbingwg/net-attach-def-admission-controller>
      * <https://github.com/k8snetworkplumbingwg/community>
      * <https://github.com/k8snetworkplumbingwg/network-attachment-definition-client>
      * <https://github.com/k8snetworkplumbingwg/multi-net-spec>
    - Tomofumi Hayashi
      * <https://github.com/k8snetworkplumbingwg/multi-networkpolicy-iptables>
      * <https://github.com/k8snetworkplumbingwg/multi-networkpolicy>
      * <https://github.com/k8snetworkplumbingwg/net-attach-def-admission-controller>
      * <https://github.com/k8snetworkplumbingwg/community>
      * <https://github.com/k8snetworkplumbingwg/multi-net-spec>
    - Peter White (Metaswitch - GitHub ID: plwhite)
      * <https://github.com/k8snetworkplumbingwg/community>
      * <https://github.com/k8snetworkplumbingwg/multi-net-spec>
    - Per/Suresh
      * <https://github.com/k8snetworkplumbingwg/community>
      * <https://github.com/k8snetworkplumbingwg/multi-net-spec>
    - Vote: all in favor, none opposed; maintainers accepted
  + NPWG GitHub Organization Ownership Candidates
    - Doug Smith
      * As a long-standing member and current owner Doug wishes to retain his ownership status, with a record of promoting collaboration among projects as they have stood prior to the acceptance of the NPWG governance document. Doug is also a contributor to a number of projects under the NPWG GitHub organization such as the network-attachment-definition-client library, as well as the multi-net-spec itself.
    - Dan Williams
      * As another long-standing member, current owner, and editor of the NPWG spec, Dan would like to continue his org ownership status. Dan is also a co-chair of SIG Network and a CNI maintainer.
    - Dave Cremins (Intel) davecremins
      * Dave has volunteered for ownership
    - Suresh Krishnan (Kaloom) sureshkrishnan
      * Suresh has volunteered for ownership
    - Moshe Levi (Nvidia) moshe010
      * Moshe has volunteered for ownership
    - Adrian Chiris (Nvidia) adrianchiris
      * Adrian has volunteered for ownership
    - Vote: all in favor, none opposed; owners accepted
  + NPWG Repository Proposals
  + SR-IOV CNI
    - * Current repository: <https://github.com/intel/sriov-cni>
      * The SR-IOV CNI is a CNI plugin which facilitates attachment of SR-IOV interfaces to pods in Kubernetes. The SR-IOV CNI is fitting for maintenance from the NPWG given our focus on attaching multiple networks to pods in Kubernetes, attaching SR-IOV virtual functions to pods in Kubernetes provides the opportunity for attachment of pods to additional high speed networks using SR-IOV hardware.
    - SR-IOV Network Device Plugin
      * Current repository: <https://github.com/intel/sriov-network-device-plugin>
      * The SR-IOV Network Device Plugin is a Kubernetes Device Plugin which manages SR-IOV Virtual Functions. The SR-IOV Device Plugin is used for resource allocation of the hardware devices that back up userspace networks configured with the SRIOV CNI. Its synergy with the SR-IOV CNI for creating high speed networks makes it fitting for maintenance in the NPWG.
    - Network Resources Injector
      * Current repository

<https://github.com/intel/network-resources-injector>

* Network Resources Injector provides functionality to patch pod spec with limits/requests of custom network resources.
  + - Whereabouts IPAM CNI
      * Current repository: <https://github.com/dougbtv/whereabouts>
      * One of the challenges when attaching multiple interfaces to pods in Kubernetes is how to manage IP address assignment for those interfaces. Whereabout solves this problem using a centralized store of IP address allocations using Kubernetes custom resources (or optionally, pure etcd).
    - Route-override CNI
      * Current repository: <https://github.com/redhat-nfvpe/cni-route-override>
      * Route-override plugin works as a meta CNI plugin to override IP routes given by previous CNI plugins. Route-override CNI is designed for multiple interfaces (i.e. net-attach-def) so that users can explicitly change routes and outgoing interfaces.
    - Device Information Spec repository
      * No existing repo.
      * Proposed repository name: device-info-spec
      * Will be the official repository to store the markdown specification for the Device Information.
    - Multus CNI
      * Current repository: <http://multus-cni.io/>
      * A meta plugin built as a reference implementation of the NPWG de-facto standard for multiple network attachments in Kubernetes
    - Vote: all in favor, none opposed; repositories accepted
* Topics
  + [Tomo]Need an additional time slot to discuss use-cases and design? (1h meeting/2w could not enough for current activity and followings)
    - NetworkPolicy use-cases and design
    - Discussion about network object for net-attach-def
      * Is that actually required or not?
    - IPv6 related design/gap analysis…
    - Add email address for interest (will send out Doodle poll to figure out a time slot):
      * [dosmith@redhat.com](mailto:dosmith@redhat.com)
      * [suresh@kaloom.com](mailto:suresh@kaloom.com)
      * [per@kaloom.com](mailto:per@kaloom.com)
      * [tohayash@redhat.com](mailto:tohayash@redhat.com)
      * [dcbw@redhat.com](mailto:dcbw@redhat.com)
      * [mcambria@redhat.com](mailto:mcambria@redhat.com)
      * [rtidwell@suse.com](mailto:rtidwell@suse.com)
      * [dave.cremins@intel.com](mailto:dave.cremins@intel.com)
      * [martin.kennelly@intel.com](mailto:martin.kennelly@intel.com)
      * [maciejskrocki@google.com](mailto:maciejskrocki@google.com)
      * [zshi@redhat.com](mailto:zshi@redhat.com)
      * hanamantagoud.v.kandagal@est.tech
      * [abdul.halim@intel.com](mailto:abdul.halim@intel.com)
  + [AdrianM/Billy] Device Information Proposal
    - **Request for vote for approval at next meeting**
      * [Proposal document](https://docs.google.com/document/d/1rBm-L1ymXIjoKNA6w2lixwBAjt9-tnbs-ee7AcLRbVE/edit#heading=h.1bflt0ii8e9d)
    - PoC:
      * Multus: <https://github.com/amorenoz/multus-cni/tree/npwg_poc2>
      * Host-device: <https://github.com/amorenoz/plugins/tree/npwg_poc>
      * SR-IOV Device Plugin: <https://github.com/amorenoz/sriov-network-device-plugin/tree/npwg_poc>
  + [Doug] Pending housekeeping
    - ~~Addition of new owners~~
    - community repo
      * Creation of member / maintainer / owner lists
    - Code of Conduct
      * group mail list
      * Pull requests to add to each repo

## September 10th, 2020

**Attendees:** Martin Kennelly (intel), Dan Williams (Red Hat),Billy McFall (Red Hat), Erez Cohen (Nvidia), Itay Ozery (NVIDIA), Doug Smith (Red Hat), Gary Loughnane (Intel), Maciej Skrocki (Google), Tomofumi Hayashi (Red Hat), Adrián Moreno (Red Hat) Per Andersson (Kaloom), Zenghui Shi (Red Hat), Abdul Halim(Intel), Liel Shoshan (Nvidia), Ryan Tidwell (SUSE), Michael Cambria (Red Hat), Killian Muldoon (Intel)

* Governance doc voting ([Governance proposal doc](https://docs.google.com/document/d/1lIWOK-W6fb1VZiSjO1BoFUs0TmoVwgd4XuVc6mtJk2c/edit#heading=h.qcv1vhrxomou))
  + We will vote on the proposal -- for the governance doc this is two sections in the proposal that will go into its own document: "mission statement" and "governance" -- notably this excludes the overview, and notes.
  + The code of conduct will be voted on separately. It's intended that we will put a code of conduct markdown document in each discrete repository under the GitHub organization.
  + We'll need to plan for some "housekeeping" next meeting. We'll need to have folks follow the procedures as outlined in the doc (if accepted), such as noting their names for membership/maintainership/ownership status, and (short) write-ups for each new repository. Doug anticipates this will include:
    - Accepting all members
    - Accepting all maintainers
    - Accepting GitHub organization owners
    - Accepting new repositories
      * Review of current repositories
  + Vote to accept the "Mission Statement" and "Governance" sections
    - Yes: all in favor
    - No: none opposed
    - Proposal accepted
  + Vote to accept code of conduct
    - Let's have both an individual volunteer to accept emails as well as an alias that goes to all the owners -- including
    - Defer this to next time. Doug will come back with a proposed email address & alias suggestion
  + Next steps include…
    - We'll need to create the stub documents for the community repo
    - Need to create governance document in community repo (as markdown)
    - Doug to fill out next week's agenda with examples of how to add yourself as a candidate (for each possible section) and send out an email to the list to let everyone know to do the same.
* [Tomo] MultiNetworkPolicy update
  + <https://github.com/k8snetworkplumbingwg/multi-networkpolicy>
  + Have new repo: multi-networkpolicy-iptables for iptables based implementation
  + Multi-networkpolicy could be a repo for API/utils among various implementation (eBPF/DPDK/tc and so on)
    - Currently API/utils will include
      * Schema
      * Go types
      * Generated client
  + Any comments/concerns?
  + [AdrianM] Is someone interested in TC-flower based one?
* [AdrianM/Billy] Device Information Proposal
  + [Proposal document](https://docs.google.com/document/d/1rBm-L1ymXIjoKNA6w2lixwBAjt9-tnbs-ee7AcLRbVE/edit#heading=h.1bflt0ii8e9d)
  + PoC:
    - Multus: <https://github.com/amorenoz/multus-cni/tree/npwg_poc2>
    - Host-device: <https://github.com/amorenoz/plugins/tree/npwg_poc>
    - SR-IOV Device Plugin: <https://github.com/amorenoz/sriov-network-device-plugin/tree/npwg_poc>

## August 27th, 2020

**Attendees:** Billy McFall (Red Hat), Dan Williams (RH), Doug Smith (RH), Tomo Hayashi (RH), Adrian Chiris (Nvidia/Mellanox), Dimitrios Markou (Intracom Telecom), Parth Yadav (University of Delhi), Ryan Tidwell (SUSE), Vivek Thrivikraman (Ericsson), Zenghui Shi (RH), peri (Ericsson), Hanamantagoud

* [Doug] GH org ownership: Right now Dan, Doug & Mike S. let's make sure we change this as we implement governance doc.
  + ...Maybe should add some language to the doc?
* [Doug] [Governance proposal doc](https://docs.google.com/document/d/1lIWOK-W6fb1VZiSjO1BoFUs0TmoVwgd4XuVc6mtJk2c/edit#heading=h.qcv1vhrxomou) updates
  + Smaller set of changes this time
  + How do we handle repos where only one company's employees has interest in maintenance, is this worth addressing?
  + How close are we? Can we vote next session? Any pressing issues?
    - Vote under new rules
    - Votes accepted from participants of at least 2 meetings (including meeting of the vote)
* [dcbw] Updates on Device Information proposal?
  + [Proposal document](https://docs.google.com/document/d/1rBm-L1ymXIjoKNA6w2lixwBAjt9-tnbs-ee7AcLRbVE/edit#heading=h.1bflt0ii8e9d)
  + [billy] will address comments in the proposal before next meeting
  + [billy] will write the "spec" document for device info JSON/etc format, key definitions, etc
  + [Billy] Provide a list of repos where POC work is being performed.
    - Peri and Dimitrios Markou willing to help with PRs once spec is defined/finalized
    - See “Device ID proposal” from July 16th below.
* [Tomo] MultiNetworkPolicy Update
  + <https://github.com/k8snetworkplumbingwg/multi-networkpolicy>
  + Name changed macvlanNetworkPolicy
  + APIVersion is changed to v1beta1
  + Any feedback?

## August 13th, 2020

**Attendees:** Billy McFall (Red Hat), Adrian Chiris (Nvidia), Maciej Skrocki (Google), Dan Williams (Red Hat), Doug Smith (Red Hat), Tomofumi Hayashi (Red Hat)

* [Doug] Governance document updates
  + [Proposal document](https://docs.google.com/document/d/1lIWOK-W6fb1VZiSjO1BoFUs0TmoVwgd4XuVc6mtJk2c/edit#heading=h.5x0d5h95i329)
  + Action Doug: Sync with Dave Cremins & Zenghui Shi
* [Adrian.C] Do we have a first candidate to start moving under NPWG ? (Given we are close to converging on the proposal doc)
  + First candidates would be SR-IOV CNI & Device Plugin
  + Some implementation details between changing the ownership of these repositories, doing a github fork, or pushing to a new remote
    - Concerns are about usage as a go library, and possible confusion for consumers and contributors to the software existing in two places on GitHub
* [Doug] "Network API" discussion from OpenDev conference
  + Doug will forward the email conversation to the group.
  + Doug participated in a round table discussion at opendev this week, and some folks were talking about the need for a "network api" in Kubernetes, and are looking to further.
  + In some brainstorming the group talked about the NPWG as being a forum for this discussion. Doug is interested to see if this group is interested in that discussion, or if this conversation belongs here or not.
  + Etherpad from the session: <https://etherpad.opendev.org/p/OpenDev_Containers_TelcoNetworkFunction>
* [Tomo]
  + macvlan-networkpolicy -> multi-networkpolicy!
    - <https://github.com/k8snetworkplumbingwg/multi-networkpolicy>

## July 30th, 2020

* [Doug] Governance document
  + [Proposal document](https://docs.google.com/document/d/1lIWOK-W6fb1VZiSjO1BoFUs0TmoVwgd4XuVc6mtJk2c/edit#heading=h.5x0d5h95i329)
  + Code of conduct
    - Doug's official opinion is to go with the contributor-covenant after review of CNCF code of conduct or contributor-covenant. This opinion is not very strong, they're quite similar.
  + SR-IOV repo move
    - Both CNI & device plugin
    - Shall we begin?
      * Billy will talk to the current SRIOV maintainers and find out if there's a particular date or time
  + What about current repos?
    - Doug says we'd put the current repos through the proposed process
* [Doug] Official working group status
  + Doug spoke with Josh Berkus from Red Hat's Open Source Program Office, and he seems to think that it should be very straight forward to propose the NPWG to the CNCF
  + Additionally, Josh notes that there's been a relaxation of the definition of a "sandbox" project under CNCF, and this may be a path forward for having a number of repositories, or an umbrella repository created as an official CNCF project.
  + Related to the code of conduct, this would be handled more readily by the CNCF.
  + [dcbw] K8s vs CNCF?
    - Doug will get more clarifications on this, is the process different? Also get Josh's opinion.
    - We already used a cncf namespace (and not k8s namespace)
* [Tomo] Last call for change repo name "macvlan-networkpolicy" to "multus-networkpolicy" (because it is not only for macvlan...)
  + Doug: What about multi-net-networkpolicy?
  + multi-networkpolicy+? secondary-networkpolicy?
* [AdrianM] Device Identification Proposal: Updates
  + [Proposal document](https://docs.google.com/document/d/1rBm-L1ymXIjoKNA6w2lixwBAjt9-tnbs-ee7AcLRbVE/edit#heading=h.1bflt0ii8e9d)

## July 16th, 2020

* [Doug] Proposal for repository governance & code of conduct
  + [Proposal document](https://docs.google.com/document/d/1lIWOK-W6fb1VZiSjO1BoFUs0TmoVwgd4XuVc6mtJk2c/edit#heading=h.5x0d5h95i329)
  + Considerations
    - Trying to keep it as simple as possible: Defining how to join, and how to become a core contributor
      * Another consideration has been raised which is: Should we have something like a "technical steering committee" -- to resolve issues with creation of new repositories and/or arbitrate conflicts with code making it into repositories?
    - Code of conduct, Doug used one from [contributor-covenent.org](http://www.contributor-covenant.org/), do we like this idea? Or possibly, should we use the CNCF code of conduct.
    - Action Doug:
      * Add links to CNCF code of conduct, and indicate recommendation / give overview
      * Note(adrianc): CNCF code of conduct is based on contributor-covenent : <https://github.com/cncf/foundation/blame/master/code-of-conduct.md#L51> :)
  + Shall we begin moving SR-IOV CNI + device plugin?
* Device ID proposal - updates from Adrian
  + Multus: <https://github.com/amorenoz/multus-cni/tree/npwg_poc>
  + SR-IOV CNI: <https://github.com/amorenoz/sriov-cni/tree/npwg_poc>
  + SR-IOV Device Plugin: <https://github.com/amorenoz/sriov-network-device-plugin/tree/npwg_poc>
  + Host-device CNI: <https://github.com/amorenoz/plugins/tree/npwg_poc>
  + All the logic of how to create / read a Device information file is in this library:
  + Network-attachment-definition-client: <https://github.com/amorenoz/network-attachment-definition-client/tree/poc/devinfo>
  + Demo-recording: <https://asciinema.org/a/9IdvLiy6loouYIwkqid1iNHYl>
  + Credits to Periyasamy Palanisamy (Ericsson)
  + Proposal: [NPWG - Device Information](https://docs.google.com/document/d/1rBm-L1ymXIjoKNA6w2lixwBAjt9-tnbs-ee7AcLRbVE/edit#heading=h.ozf4pntalp5a)

## July 2nd, 2020

* [Doug] Repos for SR-IOV CNI / device plugin -- can we host it?
  + Some concerns have been raised about the current github namespace under which the SR-IOV components have been hosted. This concern appears to be growing over time, and I'd like to propose that we could host them under the NPWG github namespace for the time being.
  + Doug is currently working on a proposal for Multus CNI to be under the CNCF, however, he hasn't been able to devote as much time to this as he would like, and therefore… It's taking some time.
    - These could potentially moved to this new namespace under the CNCF, assuming we could structure it so that associated/relevant projects make their way here.
  + No one from Intel on the call today -- we'll need to follow up
  + Looks like we need some kind of contribution guidelines and policies
    - In order to help us have some framework to work through conflicts should they arise in the future (as of now, we haven't had the need, thankfully!)
    - Tomo also mentions we need a code of conduct
      * Higher priority
    - Doug: Propose a code of conduct doc, we'll vote on it next time (if possible) and then we'll follow up and add it to all the repos.
    - Is there a model that we can follow for the contribution guidelines?
      * Doug: To talk to Red Hat resources for a model to follow herein.
  + Tomo mentions, should Multus also move at the same time?
    - Let's talk to Intel @ maintainer's meeting next week
    - [Agenda](https://www.google.com/url?q=https://docs.google.com/document/d/17-vkuoObBFBb6feXNA7tjTaKr-rs8ea0VTnqvlEdCv8/edit%23&sa=D&source=calendar&ust=1594043171755000&usg=AOvVaw0QxOGbxtRknrbYOuov7dNT)
* [Adrian.M] Update in Device Information Proposal
  + [(Draft) NPWG - Device Information](https://docs.google.com/document/d/1rBm-L1ymXIjoKNA6w2lixwBAjt9-tnbs-ee7AcLRbVE/edit?ts=5ed8e0ed)
  + The document is starting to consolidate, a quick overview of how it's going: Adrian has tried to consolidate the schema of what the device info file should contain, and there's some examples herein.
  + Fields have been defined, the type is mandatory and the additional fields are objects and the rest of the fields should exist only one-at-a-time
    - Adrian would like any input on fields that are missing (or otherwise need changes)
      * Currently there's a pci & vdpa & vhost-user device.
      * Examples are provided for each type.
  + A plumbing proposal has been written up, and Adrian has started on a diagram
    - A meta plugin implementation would read the file from this well known path after the plugins have been called.
  + Some explanation about using the file on disk as the CNI spec doesn't allow for arbitrary data in the CNI results
    - Additionally, the device plugin is called prior to scheduling, therefore it needs to communicate some information out-of-band of the CNI process, and storing data in a file is a way to have a common place for this information.
    - Some consideration raised by Peri regarding cleanup, Adrian planning add implementation details herein, especially regarding CNI DEL.
      * Same goes for device plugin, which should delete it in that case.
      * Adrian C mentions concern for device plugin cleanup, as allocate is only covered at the moment… possibly a background task somewhere?
        + The device information has nothing that is specific to the pod it's assigned to. It's kind of a snapshot representation of what the DP has in memory. The resource name is in the path, even if there's a crash in the DP and it does not shutdown cleanly, as long as the configmap hasn't changed during a restart, it will try to create the same resource pool again, and create the same root dir, and it could just clean it up and recreate it.
  + One of the most complicated cases is userspace CNI, Adrian plans to sync with Billy upon his return.
  + Adrian and Peri has a PoC under way to provide feedback to the document and specification

## June 18th, 2020

* [Tomo] macvlanNetworkPolicy update
  + support docker runtime (previously only works with cri-o)
  + adding unit-test code
  + Refactoring
  + Cleanup comments and so on.
* [Marcus N.] Additional annotations proposal
  + Override default network (already up for consideration in v2 doc, point 19)
    - * Use case: EKS replaced network breaks webhooks, Multus + override default solves this
    - Method as currently available in Multus: <https://github.com/intel/multus-cni/blob/master/doc/configuration.md#specify-default-cluster-network-in-pod-annotations>
      * v1.multus-cni.io/default-network: calico-conf
  + Namespace annotations - Allow networks to be defined for all pods within a namespace
    - Use cases:
      * Related to the above, override the default network of kube-system to use same network as control plane
      * Team specific networks / CIDR blocks within a multi-tenant environment
    - Pod annotations could still take precedence and override namespace annotations
      * [dcbw] might be nice to have namespace take precedence; since namespace permissions can be locked down via RBAC better than pods can. eg your org admin can restrict networks your namespace pods cna connect to
    - Current draft PR: <https://github.com/intel/multus-cni/pull/523>
* [Adrian.M] Updates on Device Information Proposal:
  + Option 2 and Option 3 standing. Mostly identical except for the way to expose info to the pod
  + Common:
    - Standardized Device Information formatted file
    - Device Plugin uses a directory that depends on <resourceName> and <deviceID> to store Device Information
    - NPWG Implementation:
      * If resourceName == “” { resourceName = <networkName>/<podID>}
      * A) forward <resourceName> and <deviceID> to the CNI (so it can consume information or create it)
  + Option 2:
    - Uses a bind mount to make the file accessible to the pod
  + Option 3:
    - Adds the device information to Network Status Annotations
  + Container Orchestrated Device Workgroup:
    - <https://docs.google.com/document/d/1gUgAMEThkRt4RJ7pA7ZbPPmIOX2Vb7fwH025MjfcTYU/edit#heading=h.b0tiytdjhduq>

## June 4th, 2020

* [Tomo]
  + Brainstorming macvlanNetworkPolicy
    - How do we implement networkPolicy scoping?
      * e.g. policy-test1 is only for net-attach-def, net-test1
        + Specified net-attach-def name in policy annotation? (1st)
        + Specified policy name in net-attach-def annotation? (may not implemented)
        + LabelSelector in policy (in some future)
        + LabelSelector in net-attach-def (in some future)
        + PolicyBinding which make association between net-attach-def and networkpolicy
        + Any idea?
    - Naming convention for networkpolicy (as opposed to macvlan networkpolicy)
      * Net-attach-def-network-policy
      * Additional-network-policy
      * (add more!)
* [Adrian.C] Infiniband GUID - add runtime config parameter to multi-net-crd (Voting?)
  + Google docs proposing the change are in place
    - [Issue#8](https://github.com/k8snetworkplumbingwg/multi-net-spec/issues/8) - clarifies that MAC as runtime config does not refer to IPoIB (remove IPoIB bits)
      * <https://docs.google.com/document/d/1m0q1TNhmcwKzJiCtgGuyENsaN0FxTDSHdZ9tXbJ80tY/edit>
    - [Issue #4](https://github.com/k8snetworkplumbingwg/multi-net-spec/issues/4) - Add infinibandGUID runtime config
      * <https://docs.google.com/document/d/1V0R_MEiPapZOD_SuBjzTOdGYqILBFovuy1xacYCqFHg/edit>
  + Approved by voice vote, none opposed
* [Doug] Just need a mental refresher -- where did we leave off with service abstraction?
  + It's a popularly asked question around the community. I remember we had a couple demos in the January timeframe.
    - We had proposed the KEP, but, I think we had another approach that didn't require us to add the well known label.
  + Notably: I don't want to take away from our efforts on NetworkPolicy (for example)
  + Using the current Kubernetes functionality, we can implement the service abstraction by adding a label in the service object, and kubernetes does not inject IPtables rules for the endpoint. Once we implement endpointcontroller for net-attach-defs we could implement whole end-to-end service abstraction
    - To do: need to implement endpoint controller
* [Adrian.M] Feedback on Device Information Proposal
  + <https://docs.google.com/document/d/1rBm-L1ymXIjoKNA6w2lixwBAjt9-tnbs-ee7AcLRbVE/edit?ts=5ed8e0ed>

## May 21th, 2020

* [Tomo]
  + Brainstorming for net-attach-def interface creation is mandatory or not
    - <https://github.com/intel/multus-cni/issues/492>
    - Should we have some description to have the interface mandatory in spec?
    - sec 7.2 in SPEC, there is one already, so no prob from NPWG point of view. Just need to fix it in multus...
    - In case of 'code = Unavailable ', should multus do retry?
    - Part of what could be enhanced in the specification, which states if one attachment fails -- the pod fails. However, this addresses when you can't get the annotation, that is… Before you know if the pod has additional attachments or not.
      * Multus maintainers will move forward and come back with recommendations
* [Doug] Proposal to include "should" language for section 5.3.1
  + Proposal document: <https://docs.google.com/document/d/1cm_IaQj7V_f-LedbdO1fddKY_Hs2PUvQ6qOlQz1QRJA/edit>
  + Ready to vote?
    - Proposal approved
* [Adrian.M] Document about Device Information standarization <https://docs.google.com/document/d/1rBm-L1ymXIjoKNA6w2lixwBAjt9-tnbs-ee7AcLRbVE/edit#>
  + Reference to device ID in Multus kubeletclient.go <https://github.com/intel/multus-cni/blob/master/kubeletclient/kubeletclient.go#L79-L103>

## 

## May 7th, 2020

* [Doug] Proposal to include "must" language for section 5.3.1
  + Proposal document: <https://docs.google.com/document/d/1cm_IaQj7V_f-LedbdO1fddKY_Hs2PUvQ6qOlQz1QRJA/edit>
  + Open question: Is "default/" sufficient? Or shall we use something else, I used a mix of "default/" and "namespace-a/", "namespace-b/", and "other-ns/"
* [Tomo] Macvlan-networkpolicy is now in github
  + <https://github.com/k8snetworkplumbingwg/macvlan-networkpolicy>
  + comments/feedback is welcome!
* [Adrian.C] Infiniband GUID - add runtime config parameter to multi-net-crd (Voting?)
  + [PR#742](https://github.com/containernetworking/cni/pull/742) [PR#764](https://github.com/containernetworking/cni/pull/764) was merged in CNI
  + Next step is to add support in multi-net-spec
    - Google docs proposing the change are in place
      * [Issue#8](https://github.com/k8snetworkplumbingwg/multi-net-spec/issues/8) - clarifies that MAC as runtime config does not refer to IPoIB (remove IPoIB bits)
        + <https://docs.google.com/document/d/1m0q1TNhmcwKzJiCtgGuyENsaN0FxTDSHdZ9tXbJ80tY/edit>
      * [Issue #4](https://github.com/k8snetworkplumbingwg/multi-net-spec/issues/4) - Add infinibandGUID runtime config
        + <https://docs.google.com/document/d/1V0R_MEiPapZOD_SuBjzTOdGYqILBFovuy1xacYCqFHg/edit>
  + Decision: one more round for comment, vote on proposal at the May 21st meeting
* [Adrian.M] Update on Device Plugin use of Annotations
  + Device Plugin Annotations go to the Container, not the Pod
  + Not available on downstream API
  + sriov-device-plugin env var
    - key := fmt.Sprintf("%s\_%s\_%s", "PCIDEVICE", rs.resourceNamePrefix, rs.resourcePool.GetResourceName())
    - value is a comma-separated list of PCI device addresses
  + Core problem
    - DevicePlugin has no context for network attachment mapping to device resources so it cannot put meaningful information into the environment variable name/values
    - Network Plugin has that context (via annotations, resource names, etc) but cannot modify container environment variables or mounts
  + [dcbw] Strawman proposal to start discussion
    - standardize the format of the environment variable name and value
      * <resource\_type>\_<prefix>\_<resource name>=<value1>[,<value2>...]
      * resource\_type = PCIDEVICE
        + value = PCI device addresses
      * resource\_type = VDPA
        + value = <vdpa type>,<path>
        + vdpa\_type = chardev, server, client
      * resource\_type = VHOSTUSER
        + value = <vhost\_type>,<path>
        + vhost\_type = server, client
    - standardize mount point inside the container, should be added by the DevicePlugin or manually to container mounts
      * Container path: /etc/k8s.cni.cncf.io/network-attachment-definitions
      * Host path: ?? (maybe DevicePlugin has to create a unique host-side dir that the implementation can read?)
    - implementation (multus, danm, cnigenie) writes a file to that directory for each attachment definition, with that attachment definition's name, that contains the env var (formatted as above) for that attachment
  + Adrian M will stub in a document to cover the use cases, and we'll contribute use cases as a way to get the ball rolling to come up with solutions to cover the primary cases.

## April 23th, 2020

* [tomo]
  + RFC: Does NetworkStatus object need to have a namespace for net-attach-def?
    - If Pod is in namespace1 and uses namespace2/macvlan-1, and there are namespace1/macvlan-1 and namespace2/macvlan-1, then then Pod NetworkStatus’s name cannot identify which macvlan-1 is used because status only contains its name, without namespace.

k8s.v1.cni.cncf.io/network-status: |-

{

"name": "macvlan-conf-1",

"interface": "net1",

"ips": [

"10.1.1.101"

],

"mac": "7a:8e:fe:64:da:ef",

"dns": {}

}

* + - 5.3.1 "name"
      * This required key’s value (type string) shall contain either a NetworkAttachmentDefinition object name from the pod’s Network Attachment Selection Annotation, or the name of the cluster-wide default network. The "name" may contain a namespace reference as defined in Section 4.1.1. [ref 2018-02-01 meeting @22:30]
      * eg "namespace2/macvlan-conf-1"
    - [dcbw] should we update section 5.3.1 to say "should", or "must" when in a different namespace?
      * [doug] prefers a "must" for all cases
      * [doug] will propose a spec change to 5.3.1 to require/must namespace reference in the "name" key
* [Adrian.C] Infiniband GUID - add runtime config parameter to multi-net-crd
  + [PR#742](https://github.com/containernetworking/cni/pull/742) [PR#764](https://github.com/containernetworking/cni/pull/764) was merged in CNI
  + Next step is to add support in multi-net-spec
    - Google docs proposing the change are in place
      * [Issue#8](https://github.com/k8snetworkplumbingwg/multi-net-spec/issues/8) - clarifies that MAC as runtime config does not refer to IPoIB (remove IPoIB bits)
        + [dcbw] +1 from me
      * [Issue #4](https://github.com/k8snetworkplumbingwg/multi-net-spec/issues/4) - Add infinibandGUID runtime config
        + <https://docs.google.com/document/d/1V0R_MEiPapZOD_SuBjzTOdGYqILBFovuy1xacYCqFHg/edit>
        + [dcbw] suggest "infiniband-guid" to be consistent with other keys like "default-route"
  + Will propose PRs to [Multus](https://github.com/intel/multus-cni)  , [ib-sriov-cni](https://github.com/Mellanox/ib-sriov-cni) for implementation of the new runtime config.
* [Adrian.M] Device-identification in Network-Status annotation and vDPA support
  + working on adding vDPA support to Device Plugin
  + <https://docs.google.com/document/d/1DgZuksLVIVD5ZpNUNH7zPUr-8t6GKKQICDLqIwQv-FA/edit#heading=h.s0t1yqe1jwb8>
  + Control flow
    - DP inspects kernel framework or the device itself and probes existence of vDPA DPDK framework
      * if userspace/dpdk is a unix socket in which case it can be running in server or client mode. socket directory is mounted into container
      * if kernel then it's a vhost char device, added to the container through device specification and appears a char in the container under /dev/vhost
    - Usually use DPDK with a userspace driver, CNI usually wouldn't have much to do
  + Question: if there are multiple networks, how does the application inside the container know which socket is for which network?
  + Device plugin adds an environment variable with the PCI address (has no use in vDPA because it's not a hardware device)
    - Device plugin could add annotations to the pod, which show up as a file mounted into the container
    - Env var is not standardized in kubelet Device Plugin spec
    - SRIOV device plugin implementation uses PCI\_RESOURCE\_NAME with a value of the PCI address
  + Question: do most DevicePlugins need a kubeclient?
    - Adrian M. says the DP API allows returning annotations to kubelet as a result of the Allocate() call
      * <https://github.com/kubernetes/kubernetes/blob/3e2ae631b4caef5f823a5e121f860c653da32ff5/staging/src/k8s.io/kubelet/pkg/apis/deviceplugin/v1alpha/api.pb.go#L328>
    - Adrian M. will double-check that the annotations returned are added to the Pod object
  + Question: how does an NPWG implementation (like Multus) match up information provided by the DevicePlugin with a specific NetworkAttachmentDefinition?
    - through the "resource name" that the device plugin returns and kubleet provides as the resourceMap
  + Action Item: answer questions above and discuss again next week

# [Tomo] macvlan-network policy demo? (if I finish the preparation ;)

## April 9th, 2020

* [Billy McFall - Red Hat] Device-identification in Network-Status annotation
  + Follow-up from the last meeting, Dan Williams asked for a flow of how Pods were consuming the annotation data. This does not necessarily need to be discussed in this meeting, but for reference. This is a description of how Userspace CNI works today and open to changes/recommendations going forward.

[Userspace CNI - Pass Config to Container](https://docs.google.com/document/d/1S7Rmb5NrUx-Y6i1GiPJkGxpgYjm-h_sxAIrm3dKUsIw/edit?usp=sharing)

* [Doug] Improvement of Device plugins
  + Mukesh had made us aware in the Multus maintainers meeting of an on-going effort for device plugin improvements
  + Proposal: <https://docs.google.com/document/d/1wPlJL8DsVpHnbVbTaad35ILB-jqoMLkGFLnQpWWNduc/edit?pli=1#>
  + CDI: <https://github.com/RenaudWasTaken/cdi>
* [Doug] Thoughts on injection of chained CNI plugins in addition to the existing default network?
  + Pardon for the Multus specific portions of this item, but, as input to thoughts on this kind of functionality.
  + Was taking a look at upstream Istio integration, with Multus specifically, and the default way that you use the istio-cni is as a chained CNI plugin.
  + Something that can be difficult is manipulation of the default network during day 2 operations.
  + The current istio docs (which are in the context of OpenShift) recommend an installation method which disables the chained methodology and then injects a "/networks" annotation that points at "istio-cni" and then drops an on-disk configuration (a lesser used Multus CNI feature) -- to use this, you also need to create a net-attach-def with the name "istio-cni" with an empty spec, and then it picks it up on disk.
    - This presents a few challenges
      * 1. If you're using the Multus namespace isolation feature, this likely means you need to put an istio-cni named config in each namespace
      * 2. Currently Istio completely clobbers the "/networks" annotation: <https://github.com/istio/istio/blob/4316169acb056756843c11d289a0f05a39300b71/pkg/kube/inject/webhook.go#L783-L786>
    - Tomo points out the spec 1.1 in section 3.4.2 has the specification for the empty "spec:" portion of the net-attach-def.

## March 26th, 2020

* [Jan Scheurich - Ericsson]
  + Please review first draft of spec update for device-identification in Network-Status annotation:  
    <https://docs.google.com/document/d/1xd-kAdsPzXrLds4Q7LLEJMsN8A6grZlBTnd7nBQ937s/edit>
  + [dcbw] request to map out the flow for vhost case; eg Kubelet notices container, starts DevicePlugin, DP allocates device, Kubelet calls CNI (multus/etc), then ???
    - Reach out to Billy McFall ([bmcfall@redhat.com](mailto:bmcfall@redhat.com)) if needed.
  + FYI: K8s Network & resource management: SRIOV Network Device plugin/CPU Manager/ NUMA
    - <https://docs.google.com/document/d/1sJQMHbxZdeYJPgAWK1aSt6yzZ4K_8es7woVIrwinVwI/edit#>
* [Tomo]
  + Create multus service abstraction issue in multus repo
    - <https://github.com/intel/multus-cni/issues/466>
    - To put the information/news/help
    - To track the update

## March 12th, 2020

* [Itay Ozery - Mellanox Technologies]
  + CNI and Device plugin site on Github.
    - Currently the CNI and Device plugin code are hosted at Intel's repo. We ask that we move this to a vendor-neutral Github site.
      * Doug: I've been discussing with Intel about getting Multus moved to the CNCF (and they're behind it) and have started a proposal for the CNCF TOC along these lines.
  + **Action:** Doug will coordinate with Itay/Intel/CNCF/etc and make this happen
    - Anyone invited to join the [Multus maintainers agenda (and meeting connection info)](https://docs.google.com/document/d/17-vkuoObBFBb6feXNA7tjTaKr-rs8ea0VTnqvlEdCv8/edit#)
  + Doug needs review on the presentation for CNCF
    - dcbw, Peter White and Tomo volunteered to review
    - [CNCF TOC Presentation](https://docs.google.com/presentation/d/1ARFM35yNsxLi6HUq8rllMgLF8Mdv04KqvPHGTwqJckQ/edit#slide=id.p1)
* [Jan Scheurich - Ericsson]
  + Extend Network-Status annotation:   
    Secondary CNIs injecting network attachments without a Linux netdev representation have the problem to supply the containers with the necessary identification of the attachments, e.g. PCI address of an SRIOV VF bound to vfio-pci driver (SRIOV CNI) or a Unix domain socket name for DPDK virtio-user or VPP memif (Userspace CNI).  
    To provide these CNIs with a standard way for exposing this data to containers, we suggest extending the Network-Status pod annotation with a device\_identification field. This field should be a string map allowing arbitrary key strings in order to allow CNI-specific IDs and to be able to carry more than one ID, if so needed.
  + <https://github.com/k8snetworkplumbingwg/network-attachment-definition-client/pull/21>
  + Dan suggests we start with a NPWG Spec proposal for DeviceID
    - Example proposal: <https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit>
    - Another proposal: <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
* [Adrian]
  + infiniband GUID/MAC follow-up
    - PR742 - <https://github.com/containernetworking/cni/pull/742>
    - [dcbw] naming questions: we settled on infiniband\_guid
  + Multus PR passing deviceid to chained plugins:
    - <https://github.com/intel/multus-cni/pull/448>
  + [dcbw] perhaps there's a way to pass
* [Jan Scheurich - Ericsson]
  + secondary network service abstraction - what's the status?
    - <https://github.com/kubernetes/enhancements/pull/1561>

## February 27th, 2020

* [tomo]
  + multus service abstraction update
    - <https://github.com/kubernetes/enhancements/pull/1561>
    - WIP about KEP
    - prototyping multus-service-controller
      * without KEP we may implement service
  + [peter] concern he has with this approach is that if we go with custom endpoints controllers, somebody has to write one and keep it maintained. Bugs will happen because ours and the upstream are different.
  + Notes/Options from SIG Network meeting 2020-02-20
    - Agenda doc: <https://docs.google.com/document/d/1_w77-zG_Xj0zYvEMfQZTQ-wPP4kXkpGD8smVtW_qqWM/edit>
    - Youtube:
    - ~~Option 1: when more flexibility is required from core components they are often generalized into a "Class" which external components can implement, replacing the existing Kube components~~
    - Option 2: what if the Service controller could select endpoints based on a label selector that could look at Pod.Status.PodIPs, and PodIPs had per-IP metadata. Would that be general enough to cover the use-case too?
      * Requires that we add label-style map to the PodIPs array, which is something that's been discussed before
      * Also requires that container runtime is able to pass back the right label-style map info on pod sandbox creation (eg must extend CRI
      * as well)
      * A multi-network Service would then set a label selector that indicates it wants to select IPs from pod.Spec.PodIPs that have the label "network=foobar" or "type=secondary" or something like that
    - ~~Option 3 (hacky but works today): use an admission webhook that looks for a label/annotation~~
      * ~~[minhan] annotate service as “is foobar”. Admission control sees this, copies the selector to another annotation, and clears the selector. Custom endpoints controller acts on that.~~
  + [dcbw] a KEP for defining how PodIPs and associated metadata interact would be very welcome; that would be the base for so many multi-network things

## February 13th, 2020

* [dougbtv] Admission controller
  + Is there a better way to detect a CNI conflist?
    - <https://bugzilla.redhat.com/show_bug.cgi?id=1793418#c6>
    - [dcbw] CNI's libcni could probably help out here
    - <https://github.com/containernetworking/cni/issues/750>
* [adrian] infiniband GUID/MAC follow-up
  + GUID is only one part of the hardware address, and it’s the only part that is configurable
  + Hardware address is built out of the partition ID and the GUID and some other stuff
  + Example proposal for changing the CNI spec: <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
* [tomo] follow-up on the net-attach-def security discussion/doc?
  + Implemented filter function in multus
  + <https://github.com/s1061123/multus-cni/blob/dev/filter-args/doc/configuration.md#filtering-cni-args-passing-by-the-networkattachmentdefinition-annotation>
  + list could be "+"(allow) "-"(deny) then we don't have two annotations…
  + mutually exclusive and both configured then multus failed (-> add in readme)

## January 30st, 2020

## [dcbw] infiniband GUID/MAC follow-up

* + Spec already accommodates IPoIB Link Layer address per [RFC4391 section 9.1.1](https://tools.ietf.org/html/rfc4391#section-9.1.1) [dcbw: no]
  + Is this enough for <https://github.com/k8snetworkplumbingwg/multi-net-spec/issues/4> (probably not)
  + (jell) if it is - possibly <https://github.com/containernetworking/cni/pull/742> should be rejected
  + Punted til next time due to lack of Infiniband expertise on the call
* [Doug] NetworkPolicy for secondary networks
  + Anyone else interested?
    - [dcbw] there is interest
  + Doug is interested, however, he has not yet looked into the implications or scope of this, but wanted to run it past everyone to see if anyone had initial thoughts / ideas on this topic matter.
  + Goals for this group
    - Doug's initial investigation would focus on what would be necessary upstream or what could be done out of tree
    - Dan suggests that we look at how we select which pods (and networks) can be accessible by others as one perspective on how to approach our contributions
    - Peter says we should just start with a basic API and then iterate. How do we have to extend NetworkPolicy to talk about connections between different networks, if at all?
    - Traditional way of implementing NP in a Telco world is separate networks with a firewall connecting them
    - Billy asks if L2 is relevant for NP on secondary networks; probably it is, as NetworkPolicy doesn't dictate how
  + Doug's Action Item: think more about NP on default networks, start to think about pod and network selection
    - And gather use cases and use those to feed our thought process
* [dcbw] Service abstraction follow-up
  + Peter and Tomo's implementations differ quite a bit in scope and only overlap at the edges
  + Should probably turn into the same thing in the future, but hard right now
  + Have both implemented similar features through the Multus interface
  + Peter: write a spec that says "this is how services work in multi-network" and then steal code from both PoCs to provide an implementation
  + Current discussion board (in google doc) <https://docs.google.com/document/d/1tYs_O7Dz-YQenwPz6QHwm4ZoQ3bu0-1m-2c_7dno4N8/edit>
* [dcbw] Any follow-up on the net-attach-def security discussion/doc?
  + Wants more comments on the doc, but thinking it should just be implemented
  + Tomo will just work on it and do a demo in one of the next few meetings
  + <https://docs.google.com/document/d/1jARM9WbjzpaXKC6e2W3d3_6Ir9FmA4qPeL7dweOMoSg/edit#heading=h.uxio5btjm3fu>
* [Tomo] Multus network-status
  + Multus previously (and incorrectly) used "networks-status" in the results annotation (plural networks) -- which was incorrect, it is singular "network-status" in the specification. Tomo has found that other implementations have correctly implemented the status annotation. Tomo is working on Multus changes, and will carry the incorrect annotation for some time, and gives a heads up to the deprecation of that field.
* Net-attach-def client
  + Any feedback on it?
  + Dan mentions the possibility of convenience functions, and especially validation of network selection annotations.

## January 16th, 2020

* Service Abstraction
  + [plwhite] demo of services on secondary networks
    - GitHub code at: <https://github.com/plwhite/net-service-controller>
    - Peter will populate newly created repo under NPWG @ <https://github.com/k8snetworkplumbingwg/net-service-controller>
  + [tomo] alternative demo for multus service
    - <https://github.com/s1061123/multus-proxy-k/tree/dev/work1> (note: it is pretty early stage prototype…)
  + Discussion: How do we move forward?
    - Firstly, we'll put Peter's & Tomo's work under the NPWG
    - Next, maybe we should put together a proposal to socialize these ideas further, but, with a keen eye towards addressing concerns as this has been a fairly tricky subject historically.
* [tomo/plwhite/others] <https://github.com/k8snetworkplumbingwg/network-attachment-definition-client/issues/17>
  + Multus uses ‘k8s.v1.cni.cncf.io/networks-status’ but spec uses ‘k8s.v1.cni.cncf.io/network-status’ (networks v.s. network)
  + Which one should be corrected?
  + Tomo proposes we should make some "request for comment" in the public -- we'll start with the NPWG mailing list to get some commentary.
    - What other tools are relying on this annotation?
    - Tomo will send the email out to the group.
  + Some agreement that changing the spec due to the code not matching doesn't feel great, however, with the reference implementation being widely deployed, it could have a fairly wide ranging impact.
* [Adrian/Mamduh] <https://github.com/k8snetworkplumbingwg/multi-net-spec/issues/4>
  + Mellanox is working towards adding support for Infiniband as L2 fabric  
    Leveraging IPoIB for IP networking. In infiniband the L2 unique address is called GUID and is 64bits. We would like to support passing GUID in the network annotation much like it's done today with MAC on an ethernet fabric.
  + Adrian notes that the MAC address is already overloaded in the network CRD spec (as noted in the linked issue)
  + Essentially comes down to two options:
    - Extend the overloaded field to accept the 64bits
    - Or, we can create a purpose built field for the GUID
  + Doug asks if there's any initial possible problems with extending the field. Jell voices that it seems better suited to its own field.
  + Michael C suggests that a chained CNI plugin could be used
  + Tomo mentions the possibility of the GUID being a well-known ‘cni-args’
    - See 4.1.2.1.6 in <https://github.com/k8snetworkplumbingwg/multi-net-spec/blob/master/v1.1/%5Bv1.1%5D%20Kubernetes%20Network%20Custom%20Resource%20Definition%20De-facto%20Standard.pdf>
  + Adrian notes that the "a valid 20-byte IP-over-InfiniBand Hardware address" is problematic. He'll go ahead and start a proposed change document for group review.
* [jell] back to discussion about making KEP from [Native network object proposal](https://docs.google.com/document/d/1BEKECJ4ks-GjH9f4XdtU3REn05c9AN3qv_yZ-hlnRus/edit)

## January 2nd, 2020

* Canceled due to holiday

## December 19th, 2019

* [dcbw] v1.1 spec update
* [mspreitz] Official workgroup process update?
* [tomo] net-attach-def security discussion
  + any comments?
  + <https://docs.google.com/document/d/1jARM9WbjzpaXKC6e2W3d3_6Ir9FmA4qPeL7dweOMoSg/edit#heading=h.uxio5btjm3fu>
  + Two parts to the problem:
    - 1) how to determine which options in the CNI configuration are more privileged than others
    - 2) how to determine whether a user is authorized to create/modify pods that use these more privileged options in their Network Attachment Selection Annotation
  + Discuss if RBAC can be leveraged, we'd rather not invent something new. However, there's considerations on how that can be enforced and where and at what point in time (such as an admission web hook).
    - One option is to define two ClusterRoles
      * one for basic network attachment definition creation
      * one for creating network attachment definitions that have “more privileged” options
  + Some information passed as CNI ARGs can be privileged type of information, and how/should a meta plugin (or another implementation) be informed of these
* [dougbtv] Monitoring (and debugging?)
  + <https://github.com/redhat-nfvpe/kokotap>
  + <https://github.com/networkmachinery/networkmachinery-operators>
    - (Also Kubecon EU 2019 talk, [YouTube](https://www.youtube.com/watch?v=JsJoRkmzoa0))
* Next meeting: Jan 2 or Jan 16?
  + Jan 2 canceled; next meeting will be Jan 16
* [plwhite] Services on additional networks
  + Have a rough demo
  + Tomo also interested in this
  + Peter will post the code to github

## December 5th, 2019

* net-attach-def security discussion
  + <https://docs.google.com/document/d/1jARM9WbjzpaXKC6e2W3d3_6Ir9FmA4qPeL7dweOMoSg/edit#heading=h.uxio5btjm3fu>
* Spec v1.1 update
  + still working on converting to final versions to be posted to github
  + locked down editing of the Google doc because there have been inadvertent edits
* KubeCon
  + Mike: official WG, talk of submariner, too much overlap between NSM and this group to ignore
  + Billy: kubecon get together more social
  + NSM discussion: should collaborate more closely with the Network Service Mesh group. Perhaps on the multiple Pod IP address tags that could come in v1.19.
  + Anil: missing deep dive talks
* Anil: question about NSM; discussion about NSM

## November 20th, 2019 - KubeCon San Diego meetup

* Thanks!
* Year at a glance
* What's up next?
  + Mike Sprietzer requests that we become an official WG!
  + Service abstraction -- back around on the banjo?
  + What's the impact of IPv6/IPv4 dual stack?

## 

## November 21th, 2019 - canceled due to KubeCon San Diego

* KubeCon Meetup: Wednesday November 20, 12:00 PM - 1:30 PM
  + <https://www.eventbrite.com/e/network-plumbing-working-group-meetup-kubecon-na-tickets-77882266957>

## November 7th, 2019 @ 9:30AM US Eastern

* Voting:
  + Doug’s default route proposal [[proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)]
    - Proposal accepted
  + V1.1 spec
    - CNI args [tomo]
      * <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
    - default route selection
      * <https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit>
    - runtimeConfig
      * <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
    - prefix length clarifications
      * December 6, 2018 meeting (use ToC on left side to find it)
    - bandwidth/portmappings
      * <https://docs.google.com/document/d/1-45WVRCq5CGPr0_0U09LlYoBsvxnCCDhLNXzg65uT94/edit>
    - Vote on v1.1
      * Accepted along with the Default Route proposal
  + OK to drop MS Word version
    - Keep ODT, PDF, Markdown
* [Tomo] net-attach-def security discussion
  + No update, but please take a look into it if you don't look it yet
  + <https://docs.google.com/document/d/1jARM9WbjzpaXKC6e2W3d3_6Ir9FmA4qPeL7dweOMoSg/edit#heading=h.uxio5btjm3fu>
* [jell] Native network object proposal
  + [Native network object proposal](https://docs.google.com/document/d/1BEKECJ4ks-GjH9f4XdtU3REn05c9AN3qv_yZ-hlnRus)
  + Eventually will be a KEP
* [dcbw] npwg Go library
  + parsing annotations
  + add to <https://github.com/k8snetworkplumbingwg/network-attachment-definition-client>
  + AI: Tomo will create PR next week (by Tue?)
* [Peter] Service Abstraction
  + PoC by Kural: <https://github.com/k8snetworkplumbingwg/k8s-net-attach-def-controller>
  + Please add a thread on our group for this topic to keep discussion offline

## October 24th, 2019 @ 9:30AM US Eastern

* [Doug/Tomo] Change K8sNetworkPlumbingWG to lowercase (instead of mixed case), maybe to k8snetworkplumbingwg (or change the name entirely, maybe at the time when we are made official)
  + Current proposal: we'll make the current name all lower case
  + **Renamed as of 2019-10-24**
  + <https://github.com/k8snetworkplumbingwg>
* [Doug] default route selection proposal -- shall we include in the next dot release? [[proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)]
  + No major changes since last meeting
  + Reference implementation is close: <https://github.com/intel/multus-cni/pull/393>
  + Changes for next round:
    - Add footnote regarding reasoning behind having a default route on another (see Dan's comment)
    - Add an implementation details section on routing expected CIDRs over the default network
    - Default gateway per node -- add to previously discussed items?
  + Doug will also add to the spec doc
* [dcbw] v1.1 spec? (repeat from last week for status reasons)
  + CNI args
  + default route selection (?)
  + runtimeConfig
  + prefix length clarifications
  + Nov 7th?
  + Conclusion: this is still the plan
  + Should send out mail to Google Group and other places that we will ratify v1.1 on Nov 7th
* [Doug] Kubecon Meetup
  + official invite link @ <https://www.eventbrite.com/e/network-plumbing-working-group-meetup-kubecon-na-tickets-77882266957>
* [Doug] Doug whiffed accepting his invite to the new mailing list! Can he/any others get a new invite? Or, can we make it open to join?
  + <https://groups.google.com/forum/#!forum/network-plumbing-working-group>
  + Does it not work?
  + (Doug's problem was PEBKAC!!)
  + Group was private; now public
  + <https://groups.google.com/forum/#!forum/network-plumbing-working-group>
* [Tomo] net-attach-def security discussion
  + <https://docs.google.com/document/d/1jARM9WbjzpaXKC6e2W3d3_6Ir9FmA4qPeL7dweOMoSg/edit#heading=h.uxio5btjm3fu>

## October 10th, 2019 @ 9:30AM US Eastern

* [dougbtv] default route selection proposal update [[proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)]
  + Would like to discuss Tomo's concern: *"What about the case where you need a default route unique to each node?"*
    - Tomo is thinking this may be a case on the network edge
    - Question regarding is this a global issue? Does this require addressing this at another higher layer to
    - Doug to make notes about the concern and think through some of the implications for the next round.
  + No further updates at this time. Would like to start collecting some of the biggest concerns for the next round of updates.
* [tomo]
  + runtimeConfig and cni-args PRs are in review:
    - <https://github.com/intel/multus-cni/pull/388>k
    - <https://github.com/intel/multus-cni/pull/387>
* [dougbtv] Kubecon gathering
  + Currently proposed for the Wednesday November 20th @ noon -- anyone have conflicts or another suggestion?
  + Andy Toth from Red Hat is working with the Red Hat events team to have a catered lunch and location for us to gather.
* [dcbw] v1.1 spec?
  + CNI args
  + default route selection (?)
    - Doug to reach out to Per, Suresh and Mike S. for input for next meeting on this item
  + runtimeConfig
  + prefix length clarifications
  + Nov 7th?
* [dcbw] DeviceID
  + Multus has an option to pass a DeviceID obtained from a Device Plugin down to CNI/delegate plugins; could/should this be formalized into the spec?
  + Doug & Tomo to socialize with some teammates with device plugin expertise to get some input
  + Get an overview of how "k8s.v1.cni.cncf.io/resourceName" is used and whether there should be a proposal to formalize it
* [dcbw] Will create NPWG Google Group
  + <https://groups.google.com/forum/#!forum/network-plumbing-working-group>

## September 26th, 2019 @ 9:30AM US Eastern

* (Doug will not be present due to being on vacation)
* [tomo] 'args'/'RuntimeConfig' proposal Final vote!
  + - [https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sx f9VcWeRYXFe5ko/edit](https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit)
  + Doug gives his vote (in his absence) in approval of Tomo's proposal!
  + 5 yes votes, 1 abstention, proposal adopted
* [dcbw] No update yet on Kube WG status

## September 12th, 2019 @ 9:30AM US Eastern

* [dougbtv] default route selection proposal update [[proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)]
  + Refactor made to change “gateway” key name to “default-route” and some minor edits for language when using that key name in context inside prose.
  + Still pending: Updates to specification where “This list may be empty” -- to add detail regarding “ip route add default dev eth” / with IPv6 learning the gateway
  + Question regarding how do we handle in golang the empty list values for the default-route key -- how to distinguish between set/unset here, do we make a pointer and check for a nil pointer?
  + Decided that we’ll leave metric specification for later, if requested / when appropriate
* [dcbw/tomo] review on ‘args’ proposal
  + <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
  + Tomo is not present this meeting, we’ll wait until next meet, and we’ll give a final vote. Doug to give a final read-through as well.
* New meeting location?
  + Suggestion from Kubernetes/CNCF to be a formal Kubernetes Working Group, or use a different meeting link
  + Mike requests that we formalize our governance, either through a Kube WG or SIG or some other mechanism
  + Doug/Dan will investigate Kube WG and report next meeting

## August 28th, 2019 @ 9:30AM US Eastern

* [dougbtv] default route selection proposal update [[proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)]
  + Just more tweaks. Tomo had some comments about a section that was intended to be removed during the last refactor, cleaned up that section (was dealing with the multiple keys situation previously)
  + Main topic for today on this item: Are we happy with the naming of this? The concern has been brought up that the “gateway” name is descriptive enough? Sure, the value is the gateway. But, the core change being made here is that we’re trying to express that a particular attachment has the default route.
    - Doug proposes calling the key “default-route” with a value of gateway.
  + “This list may be empty”
    - Doug will add detail here regarding IPv6 learning routes / “ip route add default dev eth0”
* [tomo] making 'last-call' for runtimeConfig (ip and mac) and cni-args
  + <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
  + Please add comments into the doc, by next meeting!
* Kubecon planning
  + Per suggests the idea of getting together for lunch
  + Doug will lead up setting up a venue / gathering people for it.

## August 15th, 2019 @ 9:30AM US Eastern

* [dougbtv] default route selection proposal update [[proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)]
  + Just tweaks this round…
    - Changed gateway to list of strings (instead of both string or list of strings)
      * Update prose + examples
    - Added note that empty list is OK (w/o mentioning IPv6 learning routes, that ok?)
    - Added stanza about order of items in the gateway list, for implementations that may add metrics to those in a given order.
  + Still need to discuss Dan’s concern with name of “gateway” (from last session)
* [tomo] CNI round table @ ONS EU (as LFN unconference)
  + <https://wiki.lfnetworking.org/display/LN/Unconf+Topic+Proposals%2C+Sept+%2719>
  + Please add your name if you join!
* ip/mac (for runtimeconfig) and cni-args (update use-cases)
  + proposal doc: <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
  + Needs some updates to the text
    - Action Item Doug: Go through with an editorial eye

## August 1st, 2019 @ 9:30AM US Eastern

* [dougbtv] default route selection proposal update [[proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)]
  + Condensed into a single key, “gateway” (removing “default-route” key)
    - [dcbw] kinda wondering if we should have decided to just use "default-route" as the key with the list of IPs as the value, rather than "gateway". I don't remember why we chose "gateway" as the name, I don't immediately associate that with a default route in my head.
  + Could use some input on the string/list-of-strings type -- added for IPv6 where multiple default routes can be used.
* [dougbtv] follow-up on multiple implementations running in parallel?
  + no follow-up yet, punt to next meeting
* [tomo] ip/mac (for runtimeconfig) and cni-args (update use-cases)
  + proposal doc: <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
  + Separate cni args requirement to separate section, 4.1.2.1.6.2 CNI Delegating Plugin Requirements
  + Should we add example use-case in spec? (I don't think so but double check....)
    - Remove example in spec.

## July 18th, 2019 @ 9:30AM US Eastern

* [dougbtv] default route selection proposal update [[proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)]
* Discussion
  + - Do we need both default-route and gateway? Can’t think of a good use for point-to-point links that wouldn’t require a gateway (eg ‘ip route add default dev eth0’).
    - Decision: combine default-route and gateway into one single “gateway” key that is an IP address.
    - IPv6: can have multiple gateways/routers on each link via Router Advertisements, the RA determines the priority. Suresh asked whether the “gateway” key should be a list?
    - IPv4 can also have multiple default routes with manually specified priorities, but this is much less common.
    - Question: for v6 the default route often comes from RA, so do we even need a static ‘gateway’ key for that? Could just say “this attachment gets the default route and whatever it already configured for the default route is OK”.
* Questions
  + - IPv4/v6
      * Should we specify this? Or should we just simply state “IP Address”, otherwise, Dan has a comment regarding
* Changes for 7/18
* Validation
  + Changed to failed validation for multiple instances of “default-route”
  + Change to failed validation for “gateway” being present when default-route is not.
* Added definition for gateway.
  + - * Would like any feedback here
* [tomo] ip/mac (for runtimeconfig) and cni-args (update use-cases)
  + <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
  + added some use-cases in cni-args (sriov cni requires it for some config that is tend to be pod-based)
* [dcbw] Update on Services PoC?
  + [Tomo] implement net-attach-def library (for net-attach-def controller as well as multus-cni)
* [Doug] What happens when there’s two implementations playing together? (mostly, food for thought for now, but think about it)
  + That is, what if there’s a system where we have two implementations that use NetworkAttachmentDefinitions -- is there a way to have some attachments made by one, and other attachments made by another?
  + Doug has recently spoke with some folks working on Contrail about this, and has invited them to come to the NPWG meetings and talk through this more.
  + See April 11th, 2019 meeting, “controllerType” for Network Attachment Definitions

## July 4th, 2019 @ 9:30AM US Eastern

* Meeting canceled due to overlap with USA public holiday

## June 20th, 2019 @ 9:30AM US Eastern

* [dougbtv] default route selection proposal update [[proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)]
  + Added section for modification to “6. Cluster-wide default network”
  + Added section with edits to the status annotation
* [tomo] ip/mac (for runtimeconfig) and cni-args (update use-cases)
  + <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
* [danwinship] noted that annotations may allow users that should not have permission to do network-y things, to do network-y things and administrators may not be aware of this.
  + [doug] suggests adding a spec section about auxiliary tools (admission controller) and how they might deal with these issues
  + [doug] also notes that with dynamic attachment and service abstraction will be auxiliary tools in the future too
  + Decision: add generic section explaining potential security pitfalls (eg which users should be able to set what annotations or use networks etc). Can also add section about example implementations of various auxiliary tools
* [tomo] any chance to change network-attachment-definition to NetworkAttachmentDefinition? (e.g. in v2 or later?)
  + [dcbw] Do you mean in the Custom Resource Definition? or somewhere else
    - -> singular, plural, shortNames in CRD yaml
  + Todo: Tomo collect current k8s trends and revisit again in next mtg
  + https://kubernetes.io/docs/tasks/access-kubernetes-api/custom-resources/custom-resource-definitions/

## June 06th, 2019 @ 9:30AM US Eastern

* [dougbtv] default route selection proposal update [[proposal doc](https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit)]
  + Added section regarding CNI plugins, especially related to having the implementation analyze and manipulate the routes after *each* attachment in order to enforce the state as implied by the defroute/gateway parameters in each annotation.
  + Could use some input on this previous observation in our agenda:
    - *Plugins may or may not return a default route (if it doesn’t, the implementation should do it? Or should it fail? Or the default route doesn’t show up for that plugin?*
    - Doug’s current thought is that it shouldn’t matter if the plugins set it or not? Since it’ll be up to the implementation to enforce? In the case of a failure within the implementation, it should probably cause a failure of all attachments.
  + Action items (Doug)
    - Re-work section to talk about how it needs to happen after all the attachments (or attachment with default route could be executed last)
    - Results object will need updates
    - Add description to default network section covering default route (including situation where there’s no defroute/gateway set but the default network attachment doesn’t set default route, as this could cause a broken pod network)
* [dcbw] runtimeConfig proposal
  + <https://docs.google.com/document/d/1-45WVRCq5CGPr0_0U09LlYoBsvxnCCDhLNXzg65uT94/edit>
  + **Proposal accepted** as modified for Mike S.'s comments
* ~~[Tomo] 'args' proposal~~
  + [~~https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit~~](https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit)
  + No update in this week. Now rewriting to use "runtimeConfig", instead of "args", for ips and mac (may add some sections to runtimeConfig doc of Dan.W)
* [Tomo] working on service abstraction PoC design
  + There hasn’t been updates to the code for a while so Tomo has picked it up and is working through the design/architecture.
  + When Tomo finalizes the design proposal he’ll share it with the group.
* [Doug] Service object extensions for IPv6 dual stack
  + We should likely keep an eye out for changes coming later this year
  + PR: <https://github.com/kubernetes/kubernetes/pull/73977>
  + KEP: <https://github.com/kubernetes/enhancements/pull/808>
  + Thockins deck from kubecon EU 2019 sig-network deep dive: <https://speakerdeck.com/thockin/sig-network-deep-dive-kubecon-eu-2019>
* [Doug] Ok to merge into net attach def admission controller?
  + <https://github.com/K8sNetworkPlumbingWG/net-attach-def-admission-controller/pull/17>
  + Will need a follow-up commit for the vendor stuff
  + If no objections in the next couple days, Doug/Tomo will merge
* [Doug] Quick note about putting controllers all together
* [Doug] CNCF proposal to move Multus to CNCF org
  + See multus-proposal branch
  + <https://github.com/K8sNetworkPlumbingWG/toc/blob/multus-proposal/proposals/multus.adoc>

## CANCELED: May 23rd, 2019 @ 9:30AM US Eastern

* Canceled due to overlap with KubeCon Barcelona

## May 09th, 2019 @ 9:30AM US Eastern

* [dcbw] runtimeConfig
  + <https://docs.google.com/document/d/1-45WVRCq5CGPr0_0U09LlYoBsvxnCCDhLNXzg65uT94/edit>
* [Tomo] 'args' proposal
  + <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
  + Need to enhance 'args' for conflist ('plugins' chain) in CNI runtime, writing proposal for that for now.
  + ‘args’ should be ‘cni-args’ to clarify the name
* [dcbw] services - develop proposal that creates a mirror Service/Endpoints objects as CRs that say which network they are present on?
  + Would require another endpoint controller, would run as a deployment in the cluster, and have some leader election. Basically the same as the Kubernetes endpoint controller, using the Kubernetes endpoint controller source, and add CR support. And then ensure that the network attachment names are populated.
  + Source repo would be managed as a fork of the upstream endpoint controller, stay as close as possible to it, and then tracked closely -- with regular pulls in the upstream changes into the fork.
  + Peter posits that there’s a possibility to leverage functionality from Istio for a service mesh.
* KubeCon Barcelona
  + Peter, Doug, Christopher, Gergely
  + Would be great to have trip reports after people get back
  + Doug will coordinate meetup on SIG Network Slack
* Next meeting (June 23) overlaps KubeCon Barcelona
  + Cancel June 23, **next meeting will be June 06, 2019**

## April 25th, 2019 @ 9:30AM US Eastern

* [Doug] Selecting which attachment gets the default route
  + Proposal: <https://docs.google.com/document/d/1pqbWYtFdEYyXd1cXuyvq_J5SRnhiXCRptXho63gI4A8/edit>
  + I used two keys:
    - “defroute” and “gateway” -- defroute is boolean, whereas gateway is a string with an IP address.
      * These related but dependent keys seem to be ok, but, would love any input on possibly simplifying to one key? Or, anyone have thoughts on that?
    - Is “defroute” ok? Or do we prefer “defaultroute” for verbosity? (or something else)
  + Discussion
    - Can we avoid the user having to specify 'gateway'? Ideally yes.
    - Need to specify what happens with interaction with CNI plugins, which add the default route themselves and may fight over it. The implementation probably needs to enforce the default route after all attachments have finished by jumping into the netns (or calling a CNI plugin to do so) and setting the route (including gateway IP) that was returned by the defroute:true plugin.
      * Plugins may or may not return a default route (if it doesn’t, the implementation should do it? Or should it fail? Or the default route doesn’t show up for that plugin?)
    - What about multiple default routes with different metrics? That's perfectly legal in Linux, but not yet supported via CNI (because it lacks the metric option for routes in Result). Skip for now.
    - Tomo brought up the issue of ClusterNetwork and ServiceNetwork routes; if the cluster-wide-default-network no longer has the default route, don't we still need to route ClusterNetwork and ServiceNetwork CIDRs to the cluster-wide-default-network regardless of what the default route is?
    - Multiple default routes? It’s possible with metrics, but, the CNI results don’t have a key for metric. So we'll skip this for now.
    - Peter notes that there isn’t anything here (at first glance) that looks like it breaks source based routing.
  + Per, Suresh & Michael (or anyone else, of course) -- any input on ECMP?
* [dcbw] runtimeConfig for bandwidth management again
  + (no changes to portMappings)
  + <https://docs.google.com/document/d/1-45WVRCq5CGPr0_0U09LlYoBsvxnCCDhLNXzg65uT94/edit>
  + Updated to make allowed mechanisms generic, and to indicate that the mechanism can differ between ingress & egress (eg policing for one, shaping for the other)
* [Tomo] Update 'args' proposal (added examples) <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
  + Mikes, Dan, Tomo will continue discussion in the doc and offline
  + Selection annotation has existing fields for ip/mac, can we just use those instead of putting them in 'args'? implementation could pass the static mac/ip in both CNI\_ARGS and in 'args' if calling CNI plugins
  + CNI Maintainers would like to move a lot of 'args' usage from CONVENTIONS.md into RuntimeConfig because that (a) ensures the value will be respected and (b) allows plugins to specify that they support particular features. 'args' cannot do either of these things.
    - But yes, this would require updates to CNI plugins
  + Mike S. asked whether Tomo's proposed args would be passed a single plugin in the chain or all of the plugins in the chain. Tomo replied that it would be passed to all of them, Mike wondered if that was too widely applicable. [history: In the CNI spec, CNI\_ARGS is mostly-deprecated in favor of 'args', but CNI\_ARGS applies to all plugins because it's an environment variable, while 'args' is currently per-plugin]

## April 11th, 2019 @ 9:30AM US Eastern

* [Doug] Service abstraction
  + What’s the status on the PoC?
    - <https://github.com/K8sNetworkPlumbingWG/k8s-net-attach-def-controller>
  + I’d like to get more involved and give the PoC a whirl, and maybe start developing a straw man proposal
  + [dcbw] need to define the basics if we want to move forward with this
    - Fully interconnected cluster nodes
    - but is each pod fully interconnected, or some pods get Net A and some Net B? If so, how do Services work (or are pods without full interconnection simply not able to access services on other networks)
  + **Action**: Doug to write a high level of what’s expected when a pod comes up and how the cluster is set up
    - strawman(?): each node has 2 NICs, 1Gb (control/signaling) and one 10Gb (fast data). All 1Gb NICs are connected to the same switch, and all 10Gb NICs are connected to a different switch. Thus all nodes are fully interconnected. Assume each network is isolated from the other (they do not share a broadcast domain).
* [Doug] Still to do re: default route proposal
* [dcbw] controllerType for NAD objects
  + requested last year, IIRC for the KubeVirt project, allows multiple implementations to coexist and know which NAD each implementation is responsible for
  + default cluster-wide network still owned by the default implementation
  + Dan will go back in NPWG meeting history and find the original use-case
* Spec update deadlines
  + v1.1: (June 1) [static proposal from tomo, runtimeConfig from dcbw, default route from Doug, ??]
  + v2.0: (October 1?) [dynamic attachment, maybe services on secondary networks?]

## March 28th, 2019 @ 9:30AM US Eastern

* [Doug] Possibility to add a tag/parameter/etc to a given annotation to say “This particular attachment should have the default route”
  + Did we discuss this previously? -- we did, and decided to punt to a later version of the specification than V1
  + Michael Cambria asked if this precluded working with ECMP; Per said ECMP is either on/off and not specific to a route
  + **Action**: Doug will develop a proposal and ask Per, Suresh & Michael for input on the ECMP issue
* [Tomo]
  + Reference-deployment repo is created
    - <https://github.com/K8sNetworkPlumbingWG/reference-deployment>
    - Please submit PR if you have deployment yaml file
  + Update ~~'ipam'~~ -> 'args' proposal <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
  + **Action:** Add some examples with various cni/args to review its feasibility
* [dcbw] runtimeConfig approval
  + [https://docs.google.com/document/d/1-45WVRCq5CGPr0\_0U09LlYoBsvxnCCDhLNXzg65uT94](https://docs.google.com/document/d/1-45WVRCq5CGPr0_0U09LlYoBsvxnCCDhLNXzg65uT94/edit)
  + **Action**: Dan will research wording of Kubernetes bandwidth annotations and respond to Mike's suggestions
* [Sebastian]
  + Open an organisation in quay.io
  + <https://groups.google.com/forum/#!topic/kubernetes-sig-network/k57njDE5eQw>
  + **Action:** Dan & Doug will investigate

## March 14th, 2019 @ 9:30AM US Eastern

* [Tomo] PR for net-attach-def-admission-controller
  + <https://github.com/K8sNetworkPlumbingWG/net-attach-def-admission-controller/pull/17>
  + Todo: will split into two PR (about vendor and others)
* [dcbw] runtimeConfig approval
  + [https://docs.google.com/document/d/1-45WVRCq5CGPr0\_0U09LlYoBsvxnCCDhLNXzg65uT94](https://docs.google.com/document/d/1-45WVRCq5CGPr0_0U09LlYoBsvxnCCDhLNXzg65uT94/edit)
  + [mike] will review in the next couple days
  + Will wait for mike’s (and more) review and approve/disapprove in next meeting
* [Sebastian Scheinkman] Request to host [kubemacpool](https://github.com/SchSeba/kubemacpool) under [K8sNetworkPlumbingWG](https://github.com/K8sNetworkPlumbingWG) repo
  + NPWG agrees to host kubemacpool under the github org, with the following requests
    - Please change references to Multus that are not examples of how to run kubemacpool to refer to the NPWG de-facto standard, rather than multus
    - File issues on the project addressing Mike's concerns around atomic transactions and leader election; continue the good discussion on implementation there
* [Tomo] Ask to create repo for reference-deployment (for multus and several cni, like flannel+multus daemonset)
  + Todo: Tomo will create repo
* [Sushanth Shetty] Intro to CNI Genie
  + <https://github.com/cni-genie/CNI-Genie>
* Kaloom demo follow-up
  + Kactus-cni: <https://github.com/kaloom/kubernetes-kactus-cni-plugin>
  + Pod-agent: <https://github.com/kaloom/kubernetes-podagent>

## February 28, 2019 @ 9:30AM US Eastern

* [tomo] no update on ipam, but working on update to adjust to other ipam (not only static)
  + <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
  + but wondering any use case (sharing same net-attach-def with different ipams...) any usecase?
* [dcbw] runtimeConfig again
  + [https://docs.google.com/document/d/1-45WVRCq5CGPr0\_0U09LlYoBsvxnCCDhLNXzg65uTsta94](https://docs.google.com/document/d/1-45WVRCq5CGPr0_0U09LlYoBsvxnCCDhLNXzg65uT94/edit)
  + Kural to see how the bandwidth option will work with SRIOV
* Kaloom demo
  + Open-sourcing their pod agent (for dynamic attachments) and their CNI metaplugin (kactus) by end of the week
* Other items?

## February 14, 2019 @ 9:30AM US Eastern

* [tomo] static proposal (status: draft) -> "ipam"
  + <https://docs.google.com/document/d/1j9kSTIIKydjqGiYd8Ni9Tej7gv1sxf9VcWeRYXFe5ko/edit>
  + TODO: Tomo will update the draft
* [dcbw] no update on runtimeConfig yet
* kaloom demo today? -> sends regrets, will push to next meeting
  + pushed to February 28th

## January 31, 2019 @ 9:30AM US Eastern

* [dougbtv] any follow-up from the goal-setting document
  + <https://docs.google.com/document/d/1bf_6j0jZbSMPH5LQJ9DZmAjn5DhP9B_YPJs70tiu-iU/edit#>
* [dcbw] vote on runtimeConfig proposal (bandwidth & portMapping)
  + Please review and leave comments before the meeting!!
  + <https://docs.google.com/document/d/1-45WVRCq5CGPr0_0U09LlYoBsvxnCCDhLNXzg65uT94/edit>
  + Tomo added some comments, which Dan will address. Punt voting to next meeting
* [dcbw] “section 0” in the CRD Spec describing document versioning
  + No objections so document versioning will proceed according to section 0 for the time being.
* [kural] Idea of creating “Cloud Native Compute & Network Framework “ CCNF/CNF repos under <https://github.com/cncf/toc>

## January 17, 2019 @ 9:30AM US Eastern

* [dougbtv] Started [goal setting document for 2019](https://docs.google.com/document/d/1bf_6j0jZbSMPH5LQJ9DZmAjn5DhP9B_YPJs70tiu-iU/edit#)
  + Doug is out on PTO and will miss the meeting!
  + Everyone is free to add, and absolutely change what’s there
  + What’s there is just some condensed items from the face-to-face
  + Thought it might be a chance to gauge interest, scope out the goals, and then try to figure out who can contribute to which portions
  + **See goal setting document for Action Items and notes**
  + [mike] one of the biggest question in front of us is Network Service Mesh, would be shame if we had diverged communities with little interaction
* [dougbtv] Stubbed in some content for the github [community repo](https://github.com/K8sNetworkPlumbingWG/community)
  + Also Thanks to Tomo for formatting it following the practices of the Kubernetes/community repo
  + PR’s welcome! (as usual!)
* [dcbw] Added “section 0” to the CRD Spec describing document versioning
  + Please leave any thoughts/suggestions in the doc as comments
* [dcbw] runtimeConfig proposal (bandwidth & portMapping)
  + <https://docs.google.com/document/d/1-45WVRCq5CGPr0_0U09LlYoBsvxnCCDhLNXzg65uT94/edit>
  + Will vote on additions next time if there is no need for significant rework

## January 03, 2019

* **NEW MEETING TIME: 9:30 AM US Eastern**
* [dougbtv] draft goal setting document proposal
  + Doesn’t have the document ready to propose yet, but would like everyone’s input
  + Ideas
    - Dynamic attachments (attach/detach outside of Kubernetes CRI ADD/DEL operations)
    - Security considerations - NetworkPolicy, ways to handle “who can access what” which we explicitly punted in V1
    - Equal capabilities for secondary attachments; make everything “primary”
    - Interworking with DevicePlugins and working with ResourceManagement
    - Kural had talked about Service objects
* [dcbw] spec versioning
  + [dougbtv] propose that once-per-quarter we ratify a new version (eg 1.1 or such)
  + [dcbw] Dan will add section to the Spec clarifying what the versioning means (eg what does “-dev” really mean)
* [dcbw] runtimeConfig proposal
  + <https://docs.google.com/document/d/1-45WVRCq5CGPr0_0U09LlYoBsvxnCCDhLNXzg65uT94/edit?usp=sharing>
* [dougbtv] network-attachment-definition admission controller
  + Now available in our github org @ <https://github.com/K8sNetworkPlumbingWG/net-attach-def-admission-controller>
* [tomo] suggests to add a “community” directory under our github, with meeting time and readme and other general WG info
  + <https://github.com/K8sNetworkPlumbingWG/community>
  + Then add short note to refer to above in <https://github.com/kubernetes/community>

## December 20, 2018

* NEW MEETING TIME: 9:30 AM US Eastern
* [dougbtv] Goal setting for the next year
  + We talked about a number of goals for the next year (at the face-to-face at Kubecon 2018 @ Seattle), e.g. before the next Kubecon, let’s start a document to outline these goals, scope them, and decide on what we’d like to tackle for the upcoming year.
  + Doug will make a new document, distill the Dec 12 Face-To-Face items into a few specific bullet points
    - eg: Mike was big into dynamic capabilities on the NICs, Mellanox was interested in bringing secondary networks to the same level as primary (services, etc); Kural working on Services
    - Also planning for incremental spec release v1.1 and then v2.0
    - Jan 03 - draft plan
    - Jan 17 - agreed/approved work schedule for next 3 - 6 months
* [dougbtv] admission controller
  + <https://github.com/K8sNetworkPlumbingWG/net-attach-def-admission-controller>
  + Merged initial working framework by Przemysław: <https://github.com/K8sNetworkPlumbingWG/net-attach-def-admission-controller/pull/1>
* [kural] working on Services on secondary networks PoC with endpoints, perhaps ready by mid-January
  + Link to services abstraction doc: <https://docs.google.com/document/d/1bDDmxqZUOkXgLuxWGuOUJJTEKj0kYqfZmbaf2xYGkzQ/edit#heading=h.s4nrypj5py64>
* [dougbtv] will mail the SIG Network list to remind people of the new time (done)
  + Reach out to Peter White, Nokia people, Levente (Kalas?) and Kaloom (Per/Suresh) to remind them of the new time
* [kural] Userspace networking considerations: how should kube handle networking that is container-specific (eg, socket to ovs-dpdk on the host) and that doesn’t involve a network namespace? Both from the setup procedure (mount points aren’t available at CNI time)

## December 12, 2018 (Kubecon meetup!)

*These notes are fairly terse and quickly written down by Doug (he encourages you to edit them!)*

* Thanks for all the work in the last year!
* What’s our big considerations for the next year! (Written quickly by Doug in advance)
  + Short term:
    - Security considerations (who can access what CRDs, what limitations there?)
  + Long term:
    - Service abstraction
    - Run-time changes to networks (attachments, IPs, routing, etc)
* What’s our wish list? (Doug brings this up to kick off the conversation)
* Kural: Multi-network impact on services
  + Can we do it with annotations, can we change the data scheme?
  + Kural notes that Dan mentions we could have a selector model?
  + Possibility for making a spec that’s specific to this topic.
* Mike: What about dynamic capabilities?
  + Mike notes that the changes after the pod is created are not respected. If anything goes wrong with a single attachment -- all attachments fail.
    - This is something fundamental that would likely have to change.
    - We’ll have to decide how to define the final state.
    - If we go dynamic, it fulfills the ones that it can, and that those that it cannot “aren’t there **yet**”. Therefore it’s inactive (in some form)
    - What about motivators? Running VMs in a pod, for example.
  + Srini mentions how he’s got annotations for setting routes to attach multiple services
    - Srini mentions that he has considerations for ONAP
    - Shall we consider the routes? How about in deployment specs? And how about policy? -Srini
* Doug: Security considerations
  + A dove-tailed conversation from Srini’s comments on network policy
  + What do we wish to see changed in v2?
  + Erez mentions, how well does our specification play with other Kubernetes tools that consider policy such as Cillium?
  + Erez, should all interfaces be first-class instead of kind of primary & secondary.
    - Dan says: Does the Kube API have the capabilities to let us address all of what we need in order to make those guarantees?
    - Are we ready to go there? Dan thinks so.
* Erez: Interfaces should be equals, default network & secondary -- with the same capabilities for both
  + Doug proposes we go there step-wise. Set
  + Let’s set a goal → let’s make them equals.
  + We should define a document to say “here’s the big picture goals. Here’s the first step. Here’s the missing steps”
    - Dan mentions that we should have service abstraction
    - Network policy, ingress as well for Kubecon 2019.
  + Let’s start a document in the next 45 days to define the big picture goals, and then define the necessary steps to get there.
  + Turn of the conversation towards resource class and which-network-is-which (wish Mike was here!), how to define topology. Conversation comes up as Srini mentions having an enode-b and connection to front-haul / back-haul and determining which is which (it’s “not exactly device plugin” to determine which is which)
* How does multi-network interwork with resource management and device plugin? (Dan mentions as a 6 month goal)
  + Feng mentions we should do this discovery automatically. A system can discover this configuration, say, lldp your devices, build a topology map
  + Erez says the automation is inherently limited, in that an operator will have to teach this automation how to learn it, for example “which pool goes where? Does it go to the radio or… where?”
    - Tomo notes that there’s tools available, noting Microsoft, for this kind of discovery.
  + Erez also mentions that say, with RDMA devices, you can’t rely solely on CNI, device plugin is required. Is this appropriate for this group? In short, yes at least under the topic of exploring the overlap and interworking of resource management and device plugins.
  + Kural mentions that some of these problems have been addressed in the considerations and implementation of the SR-IOV device plugin.
* Other projects? There’s the possibility of other topics and projects in the group, for example formalization some kind of RFCs that we can incubate and graduate? -Kural
  + Mentioning similar type of problems encountered with SR-IOV & RDMA, Doug mentions that idea could we create a library that handles both of these?
* Feng brings up what’s necessary in v2?
  + Service abstraction need to be there, -Dan
  + Mike has expressed his concern for dynamic capabilities, -Doug
  + Interaction with DP at resource management levels
  + Security consideration -Doug
    - Network policy, admission control: is about can you even attach at all? Network Policy: can these two pods talk to each other? -Dan
* Takeaways from the meeting:
  + We’ve started to come up with a goal for the next kubecon
  + Next meeting we’ll start a doc to figure out a timeline for that to define the goals
  + What other projects & topics should we consider?
  + Let’s keep solidifying what’s necessary in v2?

## December 6, 2018

* [dougbtv] KubeCon meetup
* [fpan] Propose new meeting time
  + Feng will post to list to indicate time change to 9:30 US Eastern on Thursdays and ask for one last round of objections
  + If no objections, we will change invite and this document to reflect the new time by Dec 14th
* [dcbw] 4.1.2.1.3 "ips"
  + This is currently specified to be "at least one array element and each element must be a valid IPv4 or IPv6 address" but says nothing about prefix (eg, /x).
  + This prevents plugins that do not have/need configuration for IP subnets from correctly assigning static IPs to a pod. Eg, host-local CNI plugin requires configured ranges, into which any static IP must fit, so it doesn’t need the prefix. But the ‘static’ CNI plugin doesn’t have any range, because it’s sole purpose is to assign a static IP, so it does need the prefix.
  + Proposal: section 4.1.2.1.3 should read:
    - This optional key with value of type string-array requires the plugin handling this network attachment to assign the given IP addresses to the pod. This key’s value must contain at least one array element and each element must be a valid IPv4 or IPv6 address with an optional network prefix length (eg “/24”). If the value is invalid, the Network Attachment Selection Annotation shall be invalid and ignored by the implementation. Plugins are allowed to fail the attachment request if they require a network prefix length but the request does not contain a network prefix length. Plugins are also allowed to fail the attachment request if the specified network prefix length is unacceptable to the plugin.
* [dcbw] Kubernetes “runtimeConfig” options passed to cluster-wide default network only
  + Proposal: add section 7.5:
    - Any “runtimeConfig” options passed from Kubernetes to the implementation via CNI JSON configuration must not be passed to or applied by network attachments other than the cluster-wide default network. Kubernetes expects these options to apply to only the cluster-wide default network and they may not be generally applicable.
  + Will work on proposal for “bandwidth” and “portmappings” in Network Selection Annotation extended format for next meeting (see Nov 8th meeting for rough example)

## November 22, 2018

* Canceled due to US public holiday (Thanksgiving)

## November 8, 2018

* [fpan] Propose new meeting time
  + Current time is not friendly to Asia/Europe or even Eastern
  + Proposal: 9:30 AM US Eastern
  + Feng will send proposal to SIG-Network mailing list
* [dcbw] New github org for NPWG:
  + <https://github.com/K8sNetworkPlumbingWG>
  + MD format spec:
    - <https://github.com/K8sNetworkPlumbingWG/multi-net-spec/blob/master/%5Bv1%5D%20Kubernetes%20Network%20Custom%20Resource%20Definition%20De-facto%20Standard.md>
* [dcbw] source-based routing plugin update?
  + Peter has some updates in the pipeline
* [dcbw] Conformance test plan update?
  + <https://docs.google.com/document/d/1GYWIMcevdDOmZiWqOmHZNdAWazzyJg2bYrcb0MmsKlk/edit>
* [dcbw] Kubernetes pod-specific "runtimeConfig" options: pass to default network or all networks?
  + Options that are specific to an attachment, not a network (eg per-pod-per-attachment). Ex: bandwidth shaping, portmapping
  + Proposal:
    - Specify that Kubernetes Runtime CNI "runtimeConfig" (bandwidth shaping and portmapping) options be passed through only to the default cluster-wide network
    - Add options to the extended-format Network Attachment Selection Annotation to allow setting those options on a per-attachment basis

annotations:

k8s.v1.cni.cncf.io/networks: |

[

{

"name":"net-b",

"portMappings": {

"hostPort": 8080,

"containerPort": 80,

"protocol": "tcp"

},

"bandwidth": {

"ingressRate": 2048,

"egressRate": 4096

}

}

]

* + - CNI Delegating Plugins would translate this into the CNI "runtimeConfig" key of the stdin JSON sent to the attachment's CNI plugin
  + Mike: suggests putting them into a 2nd-level "options" or "args" key
  + Dan will write up a formal proposal
* [doug] Kubecon meetup?
  + General agreement that we should have one
  + Not Monday or Tuesday or Thursday
  + **Wednesday during the day**
  + Doug will create a Doodle Poll
* Next Meeting? 22nd is a US public holiday (Thanksgiving)
  + 22nd canceled; next meeting will be Dec 6th

## October 25, 2018

* NOTE: This week is not recorded, we had a SNAFU with using the [361123509](https://zoom.us/j/361123509) zoom room, and decided to use the [5806599998](https://zoom.us/j/5806599998) zoom room to work around it. However, we could not record the meeting.
* [suresh/per] Demo
* Intel & RHT demo of SRIOV + DevicePlugin + NPWG Spec v1 + NUMA manager
  + [fpan/Abdul/zshi]
    - Showing SRIOV + Multus using NPWG Spec v1
      * <https://docs.google.com/presentation/d/1Gk_QRsRzhEWgJbpDIifcLz33iMR2YkSkXvk8H7hyhAE/edit#slide=id.p1>

## <https://asciinema.org/a/208327>

## October 11, 2018

* [Tomo/Kural] Default Network in Multiple network scenario, changing default network per pod
  + Adding flag ‘default’ (or cirtain) into net-attatch-def and admission controller (or some other stuff) verify that its network reachability
* [suresh] consistent interface naming work item from v2 document
* [Kural] Multi-Network impact on Kubernetes services
  + How to expose the additional network in a kubernetes services
  + Getting collective idea from the NPWG for a better solution
  + Proposal Incubation <https://docs.google.com/document/d/1bDDmxqZUOkXgLuxWGuOUJJTEKj0kYqfZmbaf2xYGkzQ/edit#heading=h.s4nrypj5py64>

## Sept 27, 2018

* Anyone going to KubeCon Seattle in December? We should have a meet-up/discussion…
  + dcbw, Tomo, pcm, suresh, Doug, per
* [Peter White] We have implemented a proof of concept using a Telco app (Voicemail) with multiple networks running in a Kubernetes cluster in Azure with multiple networks for physical traffic separation, using the multus plugin and our own source based routing CNI plugin. We’d like to “demo” this (actually, probably more describe what we did and what we found in the POC rather than a real demo). Expecting this to take around 10-15 minutes.
  + slides: <https://docs.google.com/presentation/d/1IOIkn7JhJY-hlvhSevjJ-m8kP2xMruhZYLKu7ozaT_A/edit?usp=sharing>

## Sept 13, 2018

* [dcbw] <https://github.com/kubernetes/community/pull/2665>
  + PR for v1 specification long-term home
* [Kural] Source based routing and multi-network
  + With Peter white use cases:
    - Link: <https://docs.google.com/document/d/1dPRrnJ1DOhVaB6roRLeObpa1xf7GmY3nU8BB27DbNZY/edit?usp=sharing>
    - Suggestion

<https://docs.google.com/document/d/1bDDmxqZUOkXgLuxWGuOUJJTEKj0kYqfZmbaf2xYGkzQ/edit?usp=sharing>

* [dcbw] Update on Conformance Tests and plan?
* [kural] Admission controller that validates the NetworkAttachmentDefinition object
  + <https://github.com/intel/multus-cni/pull/129>
* [dcbw] Round 2 on v2 considerations
  + <https://docs.google.com/document/d/1grqQ4Twqn0gnt2QraM-HVctT4HdyJgtZ-gqiGThCgaM/edit>
  + Previously agreed/accepted short term items (eg v1.5 spec):
    - **[Dan, Tomo, Kural, Doug]** Bandwidth / Capability flags
      * <https://github.com/intel/multus-cni/pull/132>

## August 30, 2018

* V1 Spec repository
  + [dcbw] still working on that :(
* Conformance test plan
  + <https://docs.google.com/document/d/1GYWIMcevdDOmZiWqOmHZNdAWazzyJg2bYrcb0MmsKlk>
  + Feng (fpan@redhat.com), Doug ([dosmith@redhat.com](mailto:dosmith@redhat.com)) and Aniket G (aniket.mailbot@gmail.com) will help Mike out
* Short-term items (eg "what can we agree on in the next 3 months?")
  + [mike] #1 Security: the pod-to-attachment-definition privilege question
    - What's the right way to exert control over which pods can reference which NetworkAttachmentDefinitions
  + [doug,suresh] #14: predictable interface names
  + [Abdul, Zhengui, Vikas, Louise, Kural, Doug, Feng] Device plugin, CNI and Resource Management alignment
    - Continue discussion/PoC with ResourceManagement WG and determine whether or not any spec changes are required
  + **[Dan, Tomo, Kural, Doug]** #4: Bandwidth / Capability flags
* Long-term items (eg "what needs PoC and lots of discussion, 6+ months?")
  + What 1 or 2 items can we pick to concentrate on?

## August 16, 2018

* [Doug] Conformance testing for v1
  + Would anyone like to collaborate on creating some conformance tests that can be used for any implementation?
  + Any considerations we need here?
  + May be useful for implementers to verify that their applications meet the requirements of the specifications.
  + [dcbw] will look into where the conformance test repo should go, likely under kubernetes community repos
  + [mike] will begin writing document describing which conformance testcases to start with and also begin bootstrapping the conformance test suite
* [Kural] Discussion regarding [Version 2 considerations document](https://docs.google.com/document/d/1grqQ4Twqn0gnt2QraM-HVctT4HdyJgtZ-gqiGThCgaM/edit#)
  + Spec release cadence
    - Pick low-hanging fruit/simple items for a v1.1 or v1.5 in 3 months
    - Continue experimenting/discussing larger and more contentious features and target 6 months for v2
  + **August 30 meeting: identify short-term and long-term items from the V2 Considerations document**
  + Items to prioritize according to discussion
  + Distinguish the spec and implementation details in version 2
  + Place for version 1 spec ?
    - [dcbw] decided to put it in kubernetes-community for now, but working on cleaning up the Markdown conversion before I push the PR
    - [dcbw] anyone know of a good Word/PDF -> Markdown converter?
      * <https://word-to-markdown.herokuapp.com/>
  + Version 2 to take the thick plugin (kuryr) / daemonset into consideration than CNI spec

## August 02, 2018

* [dcbw] spec updates review
  + kubernetes.cni.cncf.io -> k8s.cni.cncf.io
  + Added 3.2.2 "YAML Example: CNI configlist JSON in object"
* [kural & peter zhao] additional CRD object short names?
  + net
  + nad
  + Network
  + Decision: leave as “net-attach-def” for now, revisit shorter names for v2
* [peter zhao] Make CRD parts of spec optional? eg a plugin that would implement selection and status annotations, but implement custom method of storing network information
  + Decision: add to v2 document and revisit for later iterations
* [dougbtv] [Version 2 considerations document](https://docs.google.com/document/d/1grqQ4Twqn0gnt2QraM-HVctT4HdyJgtZ-gqiGThCgaM/edit#)
  + Rather rough to start, just refined the existing considerations, tried to clean out some chaff from therein, and then added a few items that I had from my notes (which likely need more information / more thought)
  + What are the next steps? Should we give some time for others to add / retract from it and then we can determine where to go from there?
* [danwinship] Are we OK with v1 being “every user can use every NetworkAttachmentDefinition”?
  + [dcbw] add a recommendation that implementations use RBAC or admission controllers to restrict?
* **Approval:**
  + **voice vote, all in favor, none opposed. V1 specification approved.**
* [peter zhao] introduction to Knitter and a demo if there will be time left.
  + Repo: <https://github.com/ZTE/Knitter>
  + Demo: <https://github.com/ZTE/Knitter/blob/master/example/demo.md>

## 

## July 19, 2018

* [dcbw] spec updates review
  + Network -> NetworkAttachmentDefinition
  + Reworked readiness to remove CNI-specific language from section 6.1, and to allow plugins to define the default network however they wish
  + Updated 5.1.1 and 5.3.3.1 to clarify how Status Annotation is constructed for CNI Result < 0.3.0
  + Section 6.2 added; cluster-wide default network must be attached first
  + Updated status annotation (5.3) and attachment selection JSON List format (4.1.2.1) sections to allow reverse DNS notation non-standard keys.
  + Deleted section 7.1 (Runtime CNI Configuration and Result Versioning)
  + Updated section 7.2 to clarify teardown failure handling
  + Added section 7.3 to echo what the CNI spec requires, which is serialization of pod network attachments
  + Added section 1.1.6 stating that implementations which are not CNI plugins are not covered by the specification.
  + Updated 3.0, 4.0, and 6.0 to allow cluster-wide default network to be implementation-defined, including in a NetworkAttachmentDefinition object
* [dcbw] Section 6.2: should cluster-wide default network always be attached first?
* [dougbtv] Should we be able to define the default network as a CRD object? Right now I believe this can only be defined on the static CNI config?
  + If you have a change in default networks, you might not be able to deterministically delete the correct default network during a CNI DEL.
  + [dcbw] Ask And Ye Shall Receive; specification updated to allow cluster-wide default network in a NetworkAttachmentDefinition object, in a CNI config file, or any other implementation-defined mechanism. Please double-check my changes to section 3.0, 4.0, and 6.0
* [peter zhao] k8s.cni.cncf.io instead of kubernetes.cni.cncf.io?
  + Decision: Change to k8s
* [Kural] Capturing v2 version requirements
  + Based on David and Vika’s proposal on Device assignment: <https://docs.google.com/document/d/1Gad4s8BaFmUQ0JeYdJcXr6sek_q-1mjoKkFPaRQL6oA/edit>
  + Device plugin and CNI coordination - allowing custom key value pair in the version 1 network json annotation
  + Difference between thick plugin and thin plugin: how to differ the thick plugin network object(Kuryr) and delegate plugin network object(multus)
  + Action: Doug will create new document consolidating potential v2 Spec discussion points
* Action: dcbw will investigate converting spec to markdown format and posting on GitHub, potentially under Kubernetes Incubator

## July 5, 2018

* [dcbw] spec updates review
  + Added concept of CNI Delegating Plugin (eg Multus or CNI-Genie)
  + Moved any CNI-related requirements to a “CNI Delegating Plugin Requirements” sub-section, leaving specification more generic to support implementation-specific attachment/detachment mechanisms
  + Added additional Readiness method for [dougbtv]
  + Added section on failure handling (7.4)
* [mike] if it’s easy to genericize implementation to account for future kube in which networks are not plugins but processes, Dan will do that
* [tomo] interface status in Status annotation
  + What should interface status be? (Tomo updated after discussion)
    - Option1) Have two status fields: lower status and status
      * field1: LOWER\_UP/LOWER\_DOWN of 'ip' command
      * field2: UP/DOWN of 'ip' command
      * Pros: Same as linux does and RFC 2863 3.1.13 compliant
      * Cons: two status fields
    - Option2) Have three status in one fields
      * LOWER\_UP+UP
      * LOWER\_DOWN+DOWN
      * LOWER\_UP+DOWN (user trying to up but link status might be down)
* [dcbw] follow-up to concurrency discussion from last time
  + Given CNI spec language requirement on serial execution of plugins for same container, V1 of this spec will require serial execution too. Revist for V2
* [peng liu] demo & discussion of Kuryr implementation of CRD spec
* [Kural/Gary] Challenges that Meta - plugin won’t match certain thick plugins use cases (Kuryr)
  + Kural will follow up on hte SIG list via emal
* [kural] Is Network status optional ? more details [link](https://github.com/intel/multus-cni/pull/87)
  + If some error occurs when setting network status
  + Update spec to clarify what happens if CNI Result i s<= 0.2.0 and not as much informatoin is present; don’t require
* [kural] Default kube network readiness and implementation readiness question
  + Dcbw will clarify wording

## June 21, 2018

* [dcbw] spec updates review
  + Added “dns” key to status map
* [dcbw] ipRequest/macRequest
  + Per Dan Winship’s suggestion, should we simply rename to “ip” and “mac”?
  + “"ipRequest" really makes it sound like it's not guaranteed to be obeyed... Why not just "ip"?”
  + Decision: rename “ip” & “mac” & “interface”
* Concurrency issues
  + Spec doesn’t explicitly say whether multiple attachments can be run in parallel or not
  + Decision: We want the CNI spec to add language to indicate that plugins must handle concurrent invocations for the same Linux network namespace (eg pod); then we should update this spec to say that pod attachments may be run concurrently too
* [dougbtv] 2.1 implementation comment
  + Comment here from Peng Liu, I think he has a point here that this should be loosened up to account for the thick plugin scenarios
  + Might align with some of the recent changes to remove the use of the “meta-plugin” terminology.
* [dougbtv] 6.1 network plugin readiness
  + Should we further expand this section to detail how this should be done? Seeing cases where its possible that the implementation itself should wait
  + Doug will update the spec to allow implementations to indicate immediate readiness but block Pod networking until the cluster-wide network is ready
* [dougbtv] Additional reference implementation: Kuryr
  + Peng Liu is working on a [blueprint](https://review.openstack.org/#/c/574131/) and an implementation of the NPWG specification using Kuryr-kubernetes
  + Dan will review the spec and determine sections that might be able to be made more generic
  + Mike Spreitzer brought up the difficulty of implementing NetworkPolicy’s contribution to <https://github.com/kubernetes/community/blob/master/keps/sig-network/0007-pod-ready%2B%2B.md> when the filtering is delegated to Neutron security groups.

## June 7, 2018

* [dcbw] Spec updates to macRequest/ipRequest/interfaceRequest
* [dcbw] How to handle “thick” plugins wrt CNIVersion and Capabilities?
  + I suggest just removing Spec.Plugin and requiring a skeleton CNI JSON config in the Network object, and the implementation would then insert the network name into the JSON before calling the plugin.
    - Pros: simplifies a bunch of code and the objects
    - Cons: makes implementations a bit more complicated since they now have to unmarshal the config as “map[string]interface{}”, insert “name”, and remarshal
  + Decision: make the spec change to do the above
* [Kural]Is there is way to validate the CRD network object during the creation ?
  + Implementing watchers
* [Kural] Multus logs
  + Can implement, Need information how the format should be
* [Kural] Interesting PoC from all corner on Multiple networking
  + Any feedback and suggestion to unified the solution ?
* [dcbw] Bikeshedding on names
  + I will post a list of possible Network object names at the top of the CRD Spec and everyone should vote on them with +1
* [peter white] Should add DNS info to network attachment status annotation
  + Dcbw will add language for it

## May 24, 2018

* [dcbw] interfaceRequest as part of extended options
* [dcbw] How to handle ip/macRequest and convert to CNI args/conventions
  + Current spec requires implementation/meta-plugin to transform mac into the right CNI ‘args’ values
  + interfaceRequest would also need to be transformed into CNI\_ARGS by the plugin
  + Decision: implementation will have to transform the values because not all are specified by CNI at this time, and some won’t be (interfaceRequest)
* [dcbw][kural] “Thick” plugin CNI JSON generation eg cniVersion number
  + Two possible options, neither one great:
    - Remove Plugin, and require implementation/meta-plugin to inject the network name into “Config” JSON if not present
    - Add a PluginCNIVersion field that would be used to create the generated JSON
* [dcbw] meta-plugin/implementation readiness vs. cluster-wide default network
  + ~~Require user to run kubernetes with --cni-config-dir=implementation-specific-directory in which kube looks for meta-plugin readiness, while meta-plugin looks for default network CNI file in /etc/cni/net.d~~
  + Dcbw will investigate changing kubelet to be smarter about config precedence and discovery
* [kural]: Standardisation of CRD De-facto spec
  + How to create standard between DP and CNI gPRC communication
  + Should explore how to formalize this specification more, instead of continuing to call it a “de-facto” standard
* [kural] Network telemetry use cases from Meta-plugin “network status”
  + Explore for V2?
* [kural] Meta plugin logs
  + Kural will figure something out

## May 10, 2018

* [dcbw] Updated specification format and organization
  + Mike: distinction between things we’re trying to specify and things that are roadmap issues
    - ~~Remove usage of “meta-plugin” and replace with “implementation”~~
    - ~~Move meta-plugin definition/etc to a section about “implementation roadmap”~~
* [dcbw] Update on multiple attachments and CNI
* [dcbw] Attachments that don’t return a CNI result still should be represented in the status map
  + Mike suggests adding an error to the status map
  + Mike brought up the issue of pod-startup network errors versus dynamic network attachment errors; pod-startup errors will fail the pod, should that happen for dynamic attachments? Seems rude…
* Eventual upstreaming into Kube API
  + Do we intend this proposal to go upstream? Yes if possible, but we just don’t know
* KubeCon trip report from Mike

## April 26, 2018

* [Dougbtv] Added spec item for convention for network attachment names
  + This is generally necessary to make for a sane way to determine what is JSON and what is comma delimited.
  + [Using DNS-1123](https://github.com/kubernetes/kubernetes/blob/8d7d7a5e0d4d7e75f5a860574346944b8cc0fc43/staging/src/k8s.io/apimachinery/pkg/util/validation/validation.go#L107-L124) labels per how kubernetes does this validation.
* [dcbw]
  + Action item: track down the multiple attachment use-cases (mike, dcbw)
  + Action item: add link to original multi-network use-cases document here
    - <https://docs.google.com/document/d/1TW3P4c8auWwYy-w_5afIPDcGNLK3LZf0m14943eVfVg/edit>
  + AI: Doug will add the “overrides” proposal to the Previously Discussed Topics section at the bottom, with a decision of opening it back up for V2 of the spec.
* [fpan]Demo (multus) update
  + Spec implementation with Multus
  + Plan to demo for week of 5/18 during SIG Network meeting
  + Trello for reference implementation effort: https://trello.com/b/3D6CMxr5/kubernetes-network-plumbing-working-group-multus-project
* [ed] Network Services

## April 12, 2018

* Dcbw cannot attend due to last-minute conflict; dougbtv will run the meeting
* [dougbtv] spec updates for multiple attachments and default network
  + <https://docs.google.com/document/d/1Ny03h6IDVy_e_vmElOqR7UdTPAG_RNydhVE1Kx54kFQ>
  + Plan to do some work upstream to support the extended tuple in CNI.
* [Mike brings up the idea of a resident daemon]
  + Noting that the spec starts with “meta-plugin” -- which implies just a thin plugin. Looking for aiming for an implementation that does track changes dynamically.
  + No, it is not about thick/thin; it is about once-at-creation or continuous maintenance of attachments.
* [dougbtv] Discussion regarding use-cases for limitations of attaching to certain networks.
  + One thought is that the meta-plugin’s credentials for accessing the API will be what is honored, rather than the free-form entry into the annotation by the user who is creating a pod.
    - Mike comes up with the idea that the implementation reads the user who created the pod, the service account for example.
  + From the spec: *“Should a cluster or namespace administrator (or somebody else) be able to prevent certain pods from attaching to certain networks?”*
* [phoracek] any new ideas how we could handle large number of logical networks (in case there are 1000 networks in overlay, we don't want to expose all of them as separate resources on each node)? If we choose to expose overlay as one resource and specify network via an attribute, we cannot follow the same pattern for heterogenous networks (e.g. sr-iov), resource scheduler would not work, could this difference cause some issues?
  + Today: Every network needs to be exposed as a resource
  + Options
    - Attributes to resources
    - Different-than integer values as request on resources
    - Have ovn connectivity as a resource, and name networks to connect to as a pod annotation. Based on the assumption that DP gains access to the pod details.
  + Another issue: Resource request APi is on a container level, network is however a pod resource
  + Note: Scheduler awareness for infinite resources like networks might make sense as well, in order to i.e. balance the load across multiple nodes
    - Isn’t this allocating bandwidth of a network?
  + API issues
    - Multiple network attachments would - today - lead to multiple allocate calls. And it would not be clear what network would be related to which resource.
    - Ed: Maybe look at the problem from a different angle.
      * <https://docs.google.com/presentation/d/1C3r91ev0tWnFFUjiV4W84Hp965YGR1D9lChZo73Jwq0/edit#slide=id.g375263091c_1_0>
* [kural] Is the chaining mechanism captured in the meta-plugin
  + There’s a gap in the specification here, there’s not a way to express a chain of plugins, e.g.
* [kural] meta-plugin is going to support to the conf file ? or only network object CRDs ?
  + Mike suggests an appendix with “current implementation considerations” (e.g. the use of the CNI configuration is assumed, generally), as this is intended to be bigger than just the current implementation
  + Dougbtv volunteers to create this section.
* [kural] Network perf-test, Kubernetes Node Performance Benchmarking - <https://docs.google.com/document/d/14SfsL1Bs5jEniNaYN7kgRan9m5ZhuyLPBPvTrZ1mK94/edit>
* [kural] Any thought or Action required for unification of device and network plugins. Alignment between device and network plugins proposal ?
* [phoracek] What should happen when someone tries to remove Network used by a Pod. Do we just block the action?
  + In 1.10 there were some nice enhancements in the PVC area which might be covering a similar problem.
* [phoracek] Not sure if it was discussed. Could we specify requested NIC name in pod networks annotation "red=eth1,blue=eth2"? User makes sure that names are unique and can hardcode them in applications running in pods containers.
  + Dougbtv to add the history of Suresh’s comments into the discussion section.

## March 29, 2018 - DP Meeting

* Joint meeting with Resource Management WG (F2F in California)
* Will be reviewing [“Tim’s reply”](https://groups.google.com/d/msg/kubernetes-sig-network/3xzITAwjfpg/A0dM8CpuCQAJ)
* Is this about introducing hooks to better support CNI in DP?
  + Not necessarily.
* Today we are focusing on network plugins and device plugins
  + DP are delivered as a DaemonSet and register with the kubelet
* Fundamental differences: Life-cycle management (see below) and what they know about the pod (namespace traversal)
  + Was a discussion how to make it suitable for VM CRIs. Was shot down. As it seemed okay that there was
* DP work different
  + No namespace traversal.
  + Devices are exposed to kubelet, asked for “move” into the right namespace.
  + Today paths and environment variables are part of allocation response
    - Env var example: GPU pods require certain ENV vars set in order to make them work correctly (~5 variables)
* Does OCI support DPs?
  + (Probably) Not.
* Looking for unification
  + Let CNI look more like DP
  + Plugin offers veth and kubelet moves it into the namespace
* CNI design was based on the assumption that there were multiple operations needed in order to get it into the namespace
  + What do we think today? Are multiple operations needed to get an interface into a namespace?
    - Routes, arp caches, iptables
  + [dcbw] Leaning to let plugins do what they want
  + WRT VM-ish networking - Nobody turned up to work on the details.
* Second major difference: Where they attach to the pod life-cycle
  + DP attach to containers
  + CNI attaches to pod
* Q: How do DP related to i.e. device groups?
  + Currently DM does not manage device cgroups
  + Are regular paths and paths to devices handled differently? No.
* AI: How far do paths go? CRI, OCI?
* ~~
* Two dimensions:
  + Types of nics: infinite (overlay) and finite (vfio)
  + Connectivity: total or partially connected
* Is it safe to assume that nodes have access to the storage network?
  + Assuming homogeneous cluster
* In the world of multiple networks - Do we assume that every node has access to every network? Or some nodes just partial access.
  + Pretty clear that we assume that not all nodes have access to all networks
* For partially connected machines - Individual NICs to same or different networks?
  + What assumptions can we make about physical wiring of NICs?
* Scheduler awareness needed for physical constraints, for overlay not so much
* Is partial connectivity an issue? Yes. For finite physical nics probably
  + I.e. Storage networks
  + Example: four nodes out of a dozen have high speed links
  + Are those links dedicated to a single pod? Both (1:1, 1:N)
    - IOW: Would you ever share a physical device?
* We could prioritize the use-cases.
* Do we have examples for every cell in the matrix
* Example
  + Openshift-sdn - each node gets a slice of the ClusterCIDR (the slice size can be administrator-configured)
  + So out of 10.1.0.0/16 ClusterCIDR, NodeA gets 10.1.1.0/24, NodeB gets 10.1.2.0/24, NodeC gets 10.1.3.0/24, etc
  + All pods living on that node get allocated an IP from the node’s subnet, regardless of the tenant
  + So PodA/NodeA gets 10.1.1.5, PodB/NodeA gets 10.1.1.6, PodC/NodeB gets 10.1.2.56, PodD/NodeC gets 10.1.3.10
  + Tenancy/NetworkPolicy is enforced via flow rules in Open vSwitch, so for example PodA might not be able to talk to PodC, even though they are both in the same 10.1.0.0/16 network.
* Worry about: Back and forth between CNI an DP
  + Q: Some more details on this?
  + UNIX Socket and annotation and passing of informations back and forth - because the life-cycle hooks are different
  + Imagine: CNI has an grpc interface. Further, DP get’s the pod name+namespace through APIs. Would this allow the DP to do whatever it needs to do.
* Q: How to represent network as resources?
* What about a the resource per pod concept?
* Can we add a GRPC interface in CNI? Storage plugins must be considered at the same time. [dcbw - yes, CNI maintainers have no problem with a gRPC interface for CNI]
* Providing pod uid to DP looks like a good opportunity.
* Should be re-raised with RMWG
* AI: Let’s understand why RMWG avoided to provide pod uids to DPs

## March 29, 2018

* [dougbtv] spec updates for multiple attachments and default network
  + (Doug couldn’t attend due to resource management f2f meeting, will attend at second half @ 15:00 US pacific)
* [dcbw] inconsistency between annotation and CRD namespacing; CRC has /v1 but annotation now has “.v1”, is that a problem?
* DevicePlugin unification
  + [Kural] Is we looking for the plugin model for communication between device plugin and CNI?
  + [Kural] We looking for decomposed solution, where each and every components together instead of duplication of features
* [dcbw] ipRequest/macRequest in extended network selection annotation
  + Should they be lists?
  + Error handling?
  + Questions about these from the spec (kural, tomo)
    - Tomo thinks we should remove from the spec and put in 'future feature' list until CNI supports capabilities and unified way to change IP address and MAC address...

## March 15, 2018

* <https://docs.google.com/document/d/1Ny03h6IDVy_e_vmElOqR7UdTPAG_RNydhVE1Kx54kFQ>
* [dcbw] Spec updates
  + Reworked Doug’s text formalizing both network selection annotation formats
  + Added section about meta-plugin translates ipRequest and macRequest into CNI config JSON
    - [dcbw] will add capability for ipRequest/macRequest that plugins would advertise in their conf/conflist which meta-plugin must check before running the attachment
* [dougbtv] Annotation name doesn’t fit regex for meta.annotations as used by Kube
  + Currently set as: kubernetes.cni.cncf.io/v1/networks
  + Doug’s recommending dropping the version portion, making it:
    - kubernetes.cni.cncf.io/networks
    - [dcbw] kubernetes.alpha.cni.cncf.io/networks?
      * I think we should version our annotations somehow at least…
  + Up for other recommendations as well, however, Kubernetes describes the invalid value as “qualified name must consist of alphanumeric characters” or dash, low-dash & dot. Starting & ending with alphanumeric chars and then “an optional DNS subdomain prefix”, “e.g. example.com/MyName”
  + [dougbtv] will update annotation to kubernetes.v1.cni.cncf.io/networks
* [dougbtv] Multiple uses of the same network attachment
  + Doug may have missed something earlier in the conversation (or otherwise didn’t grok), but… Could we not just update the wording of the spec to say something like:
    - “When attaching multiples of the same network attachment name, the meta-plugin must create unique interface names for each attachment”
      * [dcbw] still doesn’t quite work, since CNI plugins are only required to use network-name+container-id as unique tuples. Interface name is not considered. So host-local plugin for example would not work here.
    - ...with the intent that if you needed to know where it attached them, you could look it up in the resulting “status”.
  + For example, Multus will name interfaces as “net0”, “net1”, …, “netN”, allowing one to specify the same network attachment name multiple times.
  + We could potentially add the wording for the allowance of the “network-attachment-name@interface-name” (e.g. macvlan@eth5), along with the inclusion of the unique names as assigned by the meta-plugin.
  + [dcbw] will bring up uniqueness tuple issues again in CNI maintainers meeting
  + [dougbtv] will update the spec with wording about multiple attachments and interface name uniqueness
* [dougbtv] Default network
  + It appears to Doug there may need some grooming in terms of what’s necessary for the default network, the spec reads (at the time of authoring this agenda item):
    - *The meta-plugin must always attach the pod to the cluster-wide default network, keeping the existing Kubernetes behavior. This behavior currently consists of selecting the UTF-8 alphabetically first (via Go’s strings.Sort() on filenames ) valid CNI .conf or .conflist file in /etc/cni/net.d.*
  + Before any further discussion -- should we just update the wording to say that it’s up to the meta-plugin to define what it will use as the default network?
  + Question is coming up for Doug because the first config alphabetically will likely need to be the configuration for the meta-plugin (in order for Kube to call it and let it delegate to the other plugins).
    - So, should the default network either be:
      * 1. The next configuration alphabetically?
      * 2. Packed inside the configuration for the meta-plugin?
    - For example, Multus has a “delegates” field in its configuration, and that field accepts an embedded CNI configuration in JSON format, and passes that configuration through for CRDs.
  + [dougbtv] will update spec with placeholder that meta-plugin defines what the default network is and should not write it’s own CNI config to /etc/cni/net.d that Kube will load until the default plugin is ready
* [Kural]Chaining mechanism support
  + There are certain network requirement, where one network interface is used by other network interface Eg. SRIOV CNI and Bonding CNI
  + During the deletion the chaining mechanism same should be obeyed.
* [phoracek] Device plugin for host-devices CNI plugin integrated with Network CRD
  + Short presentation and demo if there will be some time left
* [jeremyeder] Resource Mgmt [Agenda finalized](https://docs.google.com/document/d/1Df6uGCzGleAhRQYZ20v55U1YCBLfxV4PJh0CIWcMHkk/edit) / Design docs out for review

| Topic 1: Device Plugin   * [Device Plugin Next Steps](https://docs.google.com/document/d/1ReQK50J9bNzEG5Pop1EC-Gco7rOryhw9cqKIXyqcUPY) * [[PUBLIC] Network Device Plugins API Changes Proposal](https://docs.google.com/document/d/1wQogpjEMkdFPeXW7LKFzVEojjl03FwAcGHKJfK_6a-I/) |
| --- |
| Topic 2: Resources   * [[Public] Resource Class Proposal](https://docs.google.com/document/d/1qKiIVs9AMh2Ua5thhtvWqOqW0MSle_RV3lfriO1Aj6U) * [Alternate Resource Class Proposal](https://docs.google.com/document/d/1666PPUs4Lz56TqKygcy6mXkNazde-vwA7q4e5H92sUc/edit#) * [[PUBLIC] Representing Compute Resources in Kubernetes](https://docs.google.com/document/d/1666PPUs4Lz56TqKygcy6mXkNazde-vwA7q4e5H92sUc) |

## March 1, 2018

* [dcbw] Spec updates
  + Loosening requirement for Kube Network object name to match CNI JSON config name
    - CNI plugins currently only get the CNI JSON network name; do they need/want the Kube Network object name? If so, how does that get passed through?
  + Some notes on versioning of configuration and results
  + Alternate network selection annotation:
    - Decision: [dcbw] keep both and formalize the alternate proposal
  + [dcbw] send mail requesting review on spec to the list
* [dcbw] Decision on Networks as Resources specified in container spec proposal
  + We do need to figure out how to handle limited resources on a given node (eg, how many SRIOV VFs are used, or there are only certain VLANs accessible, etc) and this approach could be useful for that.
  + But I suggest we add this to the “Previously discussed topics” section with a decision to investigate this as a further enhancement to the V2+ specification
  + [dcbw] will do this
* [phoracek, fabiand] Network Device Plugin Intro
  + We’d like to show a demo of our POC, takes roughly 5min
  + We’d like to introduce our research of how to do more advanced networking in Kubernetes
  + To us there is quite a significant overlap between the goals of device plugins and CNI and related topics like multiple IPs per pod
  + References
    - [DRAFT KubeVirt Networking Story](https://docs.google.com/document/d/1rmbP06iqsem9_IDThZGIC_NlCsgJyZynAl4Ghn4kCUk/edit#heading=h.7p5edn63u07n)
    - [DRAFT Network Device Plugin Idea](https://docs.google.com/document/d/1UKhhSiwdVfflkipT7WR25jy4k9rYs4PyBJ93CyW694E/edit#)
    - [Lessons learned from the KubeVirt Network Device Plugin PoC](https://docs.google.com/document/d/1zwsZk2kX8l-VtyqdRbpkatyUqBJD3q0u9IbbXa0HeLk/edit#heading=h.x799h0vqudg2)
    - [Idea: CNI Device Plugin for multi-networks](https://docs.google.com/document/d/15ibm8DzA2F8fbU9yuAQi3vXwBVDw3DTd6F6Kj86wAYM/edit?usp=sharing)
    - Bridge Network Device Plugin: <https://github.com/kubevirt/kubernetes-device-plugins>
    - [Slides](https://docs.google.com/presentation/d/13r_iECnBAh4RodcG3k1y3M0EpC9Q7uXZ4fRnj6A0LF8/edit#slide=id.g324fa0e9ca_0_45)
  + [thockin] resources probably aren't the right place for logical networks; quantity isn't really useful here and that part feels wrong. Probably need more abstraction. Also resource names should be low-cardinality and plausibly URLs to get docs on a device type.
    - Instead, the resources should be more physical-type things that logical networks could indicate they require, like a specific NIC that is connected to a really secure network, or a fast or low-latency NIC, or whatever
    - The user says in their Pod spec
    - "I want to connect to NetA" and something (perhaps the CRD has required resources specified, perhaps a controller of some kind knows the requirements) knows that NetA requires 1 SpecialNIC resource and populates the pod spec (at admission) with the right requirements. Nodes that have SpecialNICs advertise those resources. The scheduler then knows which nodes it can schedule the pod on.
      * End results: User specifies their application-ish intent. Admin owns the definition of NetA and ONLY admin knows that NetA == SpecialNIC.
      * I worry that there’s more nuance here with the fungibility of NICs. Does this presume that \*any\* instance of SpecialNIC can connect to NetA? What if that’s not true? What if all my machines are pre-provisioned with 8 NICs, pre-connected to specific networks?
        + [dcbw] I would assume then that each SpecialNIC is a different resource that somehow indicates which “network” it’s connected to. But what do I know :)
        + ResourceClass proposal (new API resource akin to Storage class) doesn’t accomodate this today, could maybe become device ID + user-provided attributes (e.g. vendor Foo, device Bar, net=mynet-{1,2,3,4..})
    - I actually kind of like the idea that not every logical network is accessible from every node, and that we can somehow publish that.
      * [dcbw] yeah that’s a nice side-effect

## February 15, 2018

* Spec updates
  + Alternate proposal for pod network selection annotation
  + Updated status annotation to use list-of-maps per Mike’s suggestion [ref 2018-02-01 meeting @22:30]
  + Clarification of default network in the status map
* Network attachment factory name vs. CNI JSON name
  + [suresh]: ugly hack would be to decorate the network name sent to CNI with the interface name at the end (eg “networkA@eth0” or “networkA-eth0”) and plugins can parse that name to figure out whether it’s the same network or a different one
  + [dan williams]: will change language requiring kube Network object name to be injected as CNI JSON name; we will make that a convention but not required
* Resource Management WG
  + [jeremy eder] the Resource Management WG will have a face-to-face March 29/30 in Santa Clara and they would like to discuss the intersection of Device Plugins and this specification before that date
    - Agenda: <https://docs.google.com/document/d/1Df6uGCzGleAhRQYZ20v55U1YCBLfxV4PJh0CIWcMHkk>

## February 1, 2018

* Discuss changes to the de-facto CRD spec
* Can we do this with Resources instead? (Dan Kenigsberg)
  + (dcbw) worth exploring as a future enhancement? Seems like it would require more integration of network plugin driver (eg cni.go or kubenet.go) and we’d need to figure out interaction between Network/AttachmentFactory/AttachmentTemplate CRs and what plugins are available on the node
  + (Kural) This is generic solution for network plugin (including overlay, sriov), instead of specific resources like smart nic or FPGA.
* [Kural] Specify sidecar network interface names in the meta-plugin?
* [dcbw] Multiple attachments to the same network

## January 18, 2018

* Continued discussion of CRD proposal
  + <https://docs.google.com/document/d/1Ny03h6IDVy_e_vmElOqR7UdTPAG_RNydhVE1Kx54kFQ/edit>
  + Outstanding questions
    - What actually is what we are calling the Network object, and what can we come up with for a concise definition?
      * Define as one CNI invocation of ADD/DEL with a given JSON””
    - Network vs. NetworkAttachmentDefinition vs. ??
      * Call it CNIConfig? Or CNIAttachmentConfig?
    - NetworkStatus as annotation vs. CRD
      * Keep annotation for now…
      * Mike to update his thoughts on “pairing object” that specifies pairing between pod and network attachment description
    - “Default” plugin
      * General agreement that all pods should use the same default network/plugin (eg current Kube behavior); pods that specify a Network object get those sidecar networks *in addition to* the default network, not instead. So it’s the cluster-wide default network that always does default route, health checking, etc.
      * If kube implements “multi-network” via multus/genie/whatever, it deals with invoking that plugin directly rather than using CNI’s normal rules to decide what plugin to invoke.
      * ~~Which Network attachment gets to set the default route in the container?~~
      * ~~Which Network attachment gets its IP/MAC/interface details reported to Kube?~~
      * ~~Which Network attachment gets used for health checking?~~
    - Pod-specific details that shouldn’t go into a Network object
      * IP, MAC, QoS
      * Mike suggests the pod annotation should be a list of json objects that specify network attachment
      * \*and\* optional IP/MAC/QoS
      * Dan will update doc with proposal

## January 4, 2018

* Discuss CRD initial proposal (same as below from Dec 21 meeting)
  + <https://docs.google.com/document/d/1Ny03h6IDVy_e_vmElOqR7UdTPAG_RNydhVE1Kx54kFQ/edit>
  + Should network objects be namespaced?
    - This can confuse CNI plugins, as they expect network names to be unique
    - Would be nice for networks to be isolatable
* Discuss reference plugin issues again
  + Long-running process + CNI shim would help with future dynamic issues and ease adapting to any future socket-based kubernetes mechanisms

## December 21, 2017

* **Action Items**
  + Dan Williams to create CRD proposal document for discussion and comments
  + Tomo (kokonet) and Peter Zhao (ZTE) to post code links to their plugins soon
* Introductions
  + Red Hat (Dan, Doug, Tomo, Feng, Marc Curry, Jeremy Eder)
  + Mirantis (Piotr Skamruk/jell)
  + Intel (Kural)
  + IBM (Mike Spreitzer) - implementing traditional IaaS cloud using parts of k8s; have running code for dynamic set of network attachments
  + Kaloom (Per, Suresh)
  + Google (Bowei, Purvi, Jing Ai)
  + Cisco (Paul Michali/pcm)
  + Metaswitch (Calum Loudon/cl)
  + ZTE (Peter Zhao)
  + vArmour networks (Prateek)
  + VMware (Abhishek)
* Charter review
  + Develop specifications, Proof-of-Concepts, and additions/extensions to Kubernetes in support of expanded networking capabilities for pods
  + Short-term
    - Enable multiple pod networks through something like Multus or CNI Genie by standardizing CRDs/annotations and perhaps writing a new multi-network reference CNI plugin
    - Hot-plugging - where should this fit in our goals?
      * Dcbw: perhaps a just-beyond-short-term goal?
      * Mike: this is what I’m really interested in
  + Medium/Long-term
    - Prototype and develop specifications for Kubernetes that allow the use-cases that multiple pod networks deliver
* CNI plugins supporting multiple networks
  + Multus CNI
    - <https://github.com/Intel-Corp/multus-cni>
      * Re-uses concept of delegates (like flannel)
      * No need to add additional plugins because it’s generic
      * Cache network info during creation and deletion to ensure we can delete the network if it’s been removed from the API
      * Default networking: in order to find primary network it uses a “master” plugin concept
      * Already used in field trials/production for NFV-type use-cases
    - Fairly simple
    - Supports both delegate plugins in CNI config, or “networks” annotation naming delegate CRDs
    - Support chaining mechanism by calling Multus recursively.
  + CNI Genie
    - <https://github.com/Huawei-PaaS/CNI-Genie>
    - Has already experimented with automatic network selection based on certain criteria
    - Annotation (“cni”) specifying list of CNI plugins to run, OR Annotation (“networks”) specifying a list of network CRDs, each of which contains one plugin to run
    - Annotations used for specifying which networks should be used, but also additional annotation (set by “controller”) which contains a status (allocated IPs from different underlying plugins)
    - CNI config contains many plugin-specific options (calico, weave, canal, romana)
      * For network telemetry; gets information about interfaces from the plugin (calico, romana, etc) itself; based on cadvisor
  + Knitter (Peter Zhao - ZTE)
    - Link: TBA. It hasn’t been opened source, but hopefully soon.
    - A “thick” plugin including three components: manager running on a central host; agent running on each node; plugin only running when invoked.
    - Not using CRD to manage network objects. They are managed by the aforementioned “manager”. Can migrate to use CRD.
    - The networks required by pod are configured in annotations of the manifest.
    - It doesn’t invoke other “3rd party” plugins. It manages and setup the networks for pod on demand. (that’s why it’s “thick”)
  + Kokonet-CNI (Tomofumi Hayashi -Red Hat)
    - Link: TBA (soon, e.g. next Jan, 2018)
    - Just Designed for PoC (not product wise)
    - Like Knitter above, CNI plugin with node agent, without CRD (for now)
    - It just puts several interfaces without kubernetes management
    - It invoke another CNI plugin like multus’s ‘delegation’
* Approach for supporting hot-plugging, out of tree
  + Definition (by Mike): add and remove network attachments outside of the normal kubelet ADD/DEL, within a pod’s lifetime
    - Use-cases are stateful applications that shouldn’t be restarted that often, but still need some dynamism to network attachments
  + Mike’s implementation/proposal of this:
    - Introduce kubelet-extension that augments kubelet behavior
    - Kubelet-extension monitors desired attachment set and invokes single-attachment CNI plugins to update actual attachment set
    - Perhaps indirectly through CRI
  + Dynamic/hot-plug will have an effect on any specs we produce; we’d have to make it clear how things would actually work
  + May also affect architecture of any reference plugin; there would need to be a long-running component
* Network Attachments vs. Multiple Networks
  + Mike wants to clarify that these are separate things
  + An attachment requires a network, but you might have more than one attachment to the same underlying network
  + Each attachment might have multiple IP addresses (eg, IPv6)
* Standardized Network CRD?
  + Concerns:
    - Portability
  + Mike: propose “common core” - all clouds at least implement the core
    - Then network classes define more capabilities on top of the core; applications could specify that they require a certain network class
  + Some suggestions to kick things off:
  + CNI config JSON in network object

| apiVersion: "kubernetes-network.cni.cncf.io/v1"  kind: Network  metadata:  name: a-bridge-network  spec:  config: ‘{  "name": "a-bridge-network",  "type": "bridge",  "bridge": "br0",  "isGateway": true,  "ipam": {  "type": "host-local",  "subnet": “192.186.5.0/24"  }  }’ |
| --- |

* + CNI config JSON on-disk (file named as “<object name>.conf” or <object name>.conflist”)

| apiVersion: "kubernetes-network.cni.cncf.io/v1"  kind: Network  metadata:  name: a-bridge-network |
| --- |

* + CNI config not required (“thick” plugin that requires no configuration)

| apiVersion: "kubernetes-network.cni.cncf.io/v1"  kind: Network  metadata:  name: a-bridge-network  spec:  plugin: example-thick-plugin |
| --- |

* + ‘config’ key takes precedence over ‘plugin’ key
* Standardized CNI Result annotation written back to pod?
  + Yes, people think there’s value to this
  + Ties in with multi-IPs-per-pod discussion that’s happening upstream with Kube right now
  + Also default route?
* “Reference” implementation CNI plugin that uses these CRDs
  + Are members interested in this?
    - Yes, there is interest
  + Or is everyone just going to implement any de-facto standards in their existing plugins instead?
    - Yes, some might, but does not block a reference plugin
  + Proposed requirements:
    - Reuse the delegate concept to keep the coding simple
    - Supports running one or more CNI plugins for a given container (obviously…)
    - Supports CNI “config lists” (eg “chains”) and result passing to each subsequent plugin (eg “prevResult”)
    - Supports returning combined result from multiple plugins to the orchestrator
    - Correctly handles CNI plugin and config versioning
    - Supports plugin capabilities as defined in CNI specification (necessary for things like HostPorts)
    - Supports CNI configuration from either disk or CRD
    - Robust unit and integration tests
    - Detailed documentation and examples
    - Cache network configuration on ADD to ensure it’s available for pod DEL even if the network object has been deleted from the API
  + Proposed nice-to-haves
    - Multiple chains; one chain is “default” and returns the combined result to orchestrator, other chains are “sidecars” and orchestrator is ignorant of them (or at least doesn’t care about their result)
    - Supports runtimes other than Kubernetes
    - Runtime extendable to allow smarter network choices (like CNI Genie)
    - Stores complex result (IPs, interfaces, MACs, etc) somewhere in the Kube API, like pod annotations, to work around the fact that Kubernetes only allows one IP per pod
    - How does the plugin interact with Kube NetworkPolicy?
      * For now, only the “default” network (the one whos IP address gets passed back to Kube) would be expected to implement NetworkPolicy; other networks are not guaranteed to