Container-Optimized OS

Container-Optimized OS, (previously Google Container-VM image a.k.a GCI) is a container-optimized OS image for the Google Cloud Platform (GCP). It is primarily for running Google services on GCP. Container-Optimized OS is an open source OS based on the open source ChromiumOS project, allowing us greater control over the build management, security compliance, and customizations for GCP.

Container-Optimized OS is open source, and is released on milestones. Example milestones are 81, 85. Each milestone will experience three release channels -- dev, beta and stable to reach stability. The promotion between those channels are about six weeks. Starting milestone 69, for every 4 milestones, the last milestone will be promoted into LTS image after it becomes stable. For details, please see COS's Release Channels and Support Policy.

COS in End-to-End tests

Container-Optimized OS images are used by kubernetes End-to-End tests and Node End-to-End tests. To see current active releases, please refer to COS's Release Notes.

How to choose an image in configuration file

There are three ways to specify an image used by each testing suite: `image`, `image_regex` or `image_family`.

- `image` is preferred, but manual updates are needed to use a newly released COS image, so the test suites don't use deprecated images. This will result to frequent yaml configuration file update everytime COS releases new image.One future option is to use an autobumper robot to update COS image automatically. e.g:

```
cos-stable:
  image: cos-77-12371-274-0
  project: cos-cloud
  metadata: "user-
data</go/src/github.com/containerd/cri/test/e2e_node/init.yaml,containerd-configure-
sh</go/src/github.com/containerd/cri/cluster/gce/configure.sh,containerd-extra-init-
sh</go/src/github.com/containerd/cri/test/e2e_node/gci-init.sh,containerd-
env</workspace/test-infra/jobs/e2e_node/containerd/cri-master/env,gci-update-
strategy=update_disabled"
```

- `image_family` should be used if you always want to use latest image in the same family. Tests will start to use new images once COS releases new image. This is not predictable and test can potentially be broken because of this. The probability of a breakage due to the OS itself is low for LTS or stable image, but high for dev or beta image. If things went wrong, it will be hard to rollback images using `image_regex` and `image_family`. e.g:

```
cos-stable:
  image_family: cos-77-lts
  project: cos-cloud
  metadata: "user-data</workspace/test-infra/jobs/e2e_node/containerd/init.yaml,cni-
template</workspace/test-infra/jobs/e2e_node/containerd/cni.template,containerd-
config</workspace/test-infra/jobs/e2e_node/containerd/config.toml"
```

- `image_regex` can also be used if you want image with the same naming pattern. Latest image will be chosen when multiple images match the regular expression. However, this option is rarely seen in the test

code.

- To update the images, using image in the same channel is preferred. Keep in mind, 69 is the first LTS image. Before that, COS only has dev, beta and stable images. That is why stable images are used quite frequently in current testing. For now, images should slowly migrate from stable to LTS if possible. For testing using dev or beta, we need to consider the original intention and keep using image in existing channel unless we understand the underlying reason.

What image is needed for your test

Consider the importance of tests and the stability of Container-Optimized OS, the following guidelines are proposed for image choice in E2E testing.

- To run release blocking tests, the latest LTS images are preferred. 'image' should be used to specify the image.

- To run presubmit, postsubmit or periodic tests, the latest LTS images are preferred. If tests need two images, you can use the latest two LTS images. LTS images are stable and usually include latest bug and security fix. 'image' should be used to specify the image.

- To integrate continuously with other container related technologies like runc, containerd, docker and kubernertes, the latest LTS or stable images are preferred. 'image_family' should be used to specify the image.

- To try out latest COS features, the latest dev or beta or stable images are preferred. 'image' or 'image_family' should be used to specify the image.

How to find current COS image in each channel

To find the current COS image, use the following command:

```
$ gcloud compute images list --project=cos-cloud | grep cos-cloud
cos-69-10895-385-0                              cos-cloud          cos-69-lts
READY
cos-73-11647-534-0                              cos-cloud          cos-73-lts
READY
cos-77-12371-274-0                              cos-cloud          cos-77-lts
READY
cos-81-12871-119-0                              cos-cloud          cos-81-lts
READY
cos-beta-81-12871-117-0                         cos-cloud          cos-beta
READY
cos-dev-84-13078-0-0                            cos-cloud          cos-dev
READY
cos-stable-81-12871-119-0                       cos-cloud          cos-stable
READY
```

COS image will experience dev, beta, stable and LTS stage. Before LTS stage, image is named with its family as a prefix, e.g cos-dev, cos-beta, cos-stable. However, the milestone number in those families may change when channel promotions happen. Only when a milestone becomes LTS, the image will have a new family, and the milestone number in the image name stays the same. The image will be always there even after the milestone is deprecated.