SEBA on ARM - porting and upstreaming work

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    - Add support for ARM64 for the CORD Docker images
        - Packer support for ARM64
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    - Add support for ARM64 in upstream helm-charts

SEBA has numerous dependencies that have to be ported to and/or validated on Arm hardware. As of February 25, 2019, this is the status of that effort. The items in red still need to be ported and tested. I've included the actual spreadsheet with links for ease of use.

Also, we have now confirmed that the major CORD components, including ONOS, do run on Ampere eMAG, Cavium TX1, Rockchip 3328, Rockchip 3399, HiSilicon Hi1616, and AllWinner H5.

Code is available at [iec.git] / src / use_cases / seba_on_arm /

https://gerrit.akraino.org/r/gitweb?p=iec.git;a=tree;f=src/use_cases/seba_on_arm;h=eb7ad5a5aeec3a18ead0039e7d66b5c92fa5d3db;hb=HEAD

Testing is available at

https://wiki.akraino.org/display/AK/SEBA+Testing

Port Overview

CORD Platform							
Chart Dependency	**Status**	**Container Dependency**	**Tag**	**Is ONF?**	**Arm Tag**	**Arm image**	**Repo**
etcd-operator	1	quay.io/coreos/etcd-operator	v0.9.2		v0.9.2	cachengo/etcd-operator	https://github.com/coreos/etcd-operator/
	1	quay.io/coreos/etcd	v3.3.10		v3.3.10	cachengo/etcd	https://github.com/etcd-io/etcd
kafka	1	lwolf/kubectl_deployer	0.4		0.4	iecedge/kubectl_deployer_arm64	https://github.com/lwolf/kubectl-deployer-docker
	1	solsson/kafka-prometheus-jmx-exporter@sha256	i2c20ea6be76885dfc20cd9ff		misc-dockerfiles	iecedge/kafka-prometheus-jmx-exporter_arm6	https://github.com/solsson/dockerfiles/tree/misc-dockerfiles
	1	danielqsj/kafka-exporter	v1.2.0		v1.2.0	iecedge/kafka-exporter_arm64	https://github.com/danielqsj/kafka_exporter
	1	confluentinc/cp-kafka	4.1.2-2		4.1.2-2	akrainoenea/cp-kafka	https://github.com/confluentinc/cp-docker-images
	1	gcr.io/google_samples/k8szk	v3		v3	iecedge/k8szk_arm64	https://github.com/kubernetes/contrib
	1	sscaling/jmx-prometheus-exporter	0.3.0		0.3.0	cachengo/jmx-prometheus-exporter	https://github.com/prometheus/jmx_exporter
	1	josdotso/zookeeper-exporter	v1.1.2		v1.1.2	akrainoenea/zookeeper_exporter	https://github.com/alexandruavadanii/zookeeper_exporter
logging	1	docker.elastic.co/elasticsearch/elasticsearch-oss	6.4.2		6.4.2	akrainoenea/elasticsearch-oss	https://github.com/elastic/elasticsearch-docker
	1	busybox	latest		latest	busybox	
	1	gcr.io/google-containers/fluentd-elasticsearch	v2.3.1		v2.3.1	akrainoenea/fluentd-elasticsearch	https://github.com/alexandruavadanii/kubernetes/tree/fluent
	1	docker.elastic.co/kibana/kibana-oss	6.4.2		6.4.2	akrainoenea/kibana-oss	https://github.com/elastic/kibana-docker
	1	docker.elastic.co/logstash/logstash-oss	6.4.2		6.4.2	akrainoenea/logstash-oss	https://github.com/elastic/logstash-docker
	1	bonniernews/logstash_exporter	v0.1.2		v0.1.2	akrainoenea/logstash_explorer	https://github.com/alexandruavadanii/logstash_exporter
Nem-monitoring	1	opencord/kafka-topic-exporter	1.1.2	x	1.1.2	akrainoenea/kafka-topic-exporter	https://gerrit.opencord.org/kafka-topic-exporter.git
	1	grafana/grafana	5.1.3		5.4.3	grafana/grafana	
	1	appropriate/curl	latest		latest	akrainoenea/curl	https://github.com/appropriate/docker-curl
	1	kiwigrid/k8s-sidecar	0.0.3		0.0.3	akrainoenea/k8s-sidecar	https://github.com/kiwigrid/k8s-sidecar
	1	prom/alertmanager	v0.15.0		v0.15.0	akrainoenea/alertmanager	https://github.com/alexandruavadanii/alertmanager
	1	jimmidyson/configmap-reload	v0.2.2		V0.2.2	carlosedp/configmap-reload	
	1	busybox	latest		latest	busybox	
	1	quay.io/coreos/kube-state-metrics	v1.3.1		v1.3.1	akrainoenea/kube-state-metrics	https://github.com/kubernetes/kube-state-metrics
	1	prom/node-exporter	v0.16.0		v0.16.0	akrainoenea/node-exporter	https://github.com/alexandruavadanii/node_exporter
	1	prom/prometheus	v2.3.1		v2.3.1	akrainoenea/prometheus	https://github.com/alexandruavadanii/prometheus
	1	prom/pushgateway	v0.5.2		v0.5.2	akrainoenea/pushgateway	https://github.com/alexandruavadanii/pushgateway
Onos	1	onosproject/onos	1.13.5	x	1.13.5	cachengo/onos	https://github.com/cachengo/onos
	1	docker.elastic.co/beats/filebeat-oss	6.4.2		6.4.2	akrainoenea/filebeat-oss	https://github.com/alexandruavadanii/beats-docker
Xos-core	1	xosproject/xos-core	2.1.50	x	2.1.50	cachengo/xos-core	https://github.com/cachengo/xos
	1	xosproject/chameleon	2.1.25	x	2.1.25	cachengo/chameleon	https://github.com/cachengo/xos
	1	xosproject/xos-tosca	1.1.6	x	1.1.6	cachengo/xos-tosca	https://github.com/cachengo/xos-tosca
	1	xosproject/xos-api-tester	master	x	2.0.6-dev	cachengo/xos-api-tester	https://github.com/cachengo/cord-tester
	1	postgres	10.3-alpine		10.3-alpine	postgres	
	1	xosproject/xos-gui	1.0.3	x	1.0.3	cachengo/xos-gui	https://github.com/cachengo/xos-gui
	1	xosproject/xos-ws	2.0.1	x	2.0.1	cachengo/xos-ws	https://github.com/cachengo/xos-rest-gw
Seba Profile							
Chart Dependency		**Container Dependency**	**Tag**	**Is ONF?**	**Arm Tag**	**Arm image**	**Repo**
Base-kubernetes	1	xosproject/tosca-loader	1.1.5	x	1.1.5	cachengo/tosca-loader	https://github.com/cachengo/xos-tosca
	1	xosproject/kubernetes-synchronizer	1.1.3	x	1.1.3	cachengo/kubernetes-synchronizer	https://github.com/cachengo/cord-kubernetes-service
Seba-services	1	xosproject/tosca-loader	1.1.5	x	1.1.5	cachengo/tosca-loader	https://github.com/cachengo/xos-tosca
	1	xosproject/xos-api-tester	master	x	2.0.6-dev	cachengo/xos-api-tester	https://github.com/cachengo/cord-tester
	1	xosproject/fabric-synchronizer	2.1.6	x	2.1.6	cachengo/fabric-synchronizer	https://github.com/cachengo/fabric
	1	xosproject/fabric-crossconnect-synchronizer	1.1.4	x	1.1.4	cachengo/fabric-crossconnect-synchronizer	https://github.com/cachengo/fabric-crossconnect
	1	xosproject/onos-synchronizer	2.0.7	x	2.0.7	cachengo/onos-synchronizer	https://github.com/cachengo/onos-service
	1	xosproject/rcord-synchronizer	1.0.8	x	1.0.8	cachengo/rcord-synchronizer	https://github.com/cachengo/rcord
	1	opencord/sadis-server	1.0.1	x	1.0.1	cachengo/sadis-server	https://github.com/cachengo/sadis-server
	1	xosproject/volt-synchronizer	2.1.14	x	2.1.14	cachengo/volt-synchronizer	https://github.com/cachengo/olt-service
voltha	1	voltha/voltha-voltha	1.6.0	x	1.6.0	cachengo/voltha-voltha	https://github.com/cachengo/voltha
	1	voltha/voltha-cli	1.6.0	x	1.6.0	cachengo/voltha-cli	https://github.com/cachengo/voltha
	1	voltha/voltha-ofagent	1.6.0	x	1.6.0	cachengo/voltha-ofagent	https://github.com/cachengo/voltha
	1	voltha/voltha-netconf	1.6.0	x	1.6.0	cachengo/voltha-netconf	https://github.com/cachengo/voltha
	1	voltha/voltha-envoy	1.6.0	x	1.6.0	cachengo/voltha-envoy	https://github.com/cachengo/voltha
	1	voltha/voltha-alarm-generator	1.6.0	x	1.6.0	cachengo/voltha-alarm-generator	https://github.com/cachengo/voltha
	1	tpdock/freeradius	2.2.9		2.2.8	cachengo/freeradius	https://github.com/cachengo/freeradius
	1	gcr.io/google_containers/defaultbackend	1.4		1.4	gcr.io/google_containers/defaultbackend-arm64	
	1	quay.io/kubernetes-ingress-controller/nginx-ingress-controller	0.10.2		0.10.2	quay.io/kubernetes-ingress-controller/nginx-ingress-controller-arm64	
	1	alpine	3.6		3.6	alpine	
	1	quay.io/coreos/etcd	v3.2.18		v3.2.18	cachengo/etcd	https://github.com/coreos/etcd
		Total # of packages: 56					
		Total % of Voltha: 100%					
		Total % of Seba-services: 100%					
		Total % of Base-Kubernetes: 100%					
		Total % of XOS Core: 100%					
		Total % of ONOS: 100%					
		Total % of Nem-monitoring: 100%					
		Total % of Logging: 100%					
		Total % of Kafka: 100%					
		Total % of Etcd-Operator: 100%					
		Total % Completion: 100%					

SebaImageDependencyList-03032019.xlsx

Trevor Tao Updated the spreadsheet with latest completions and also included % completion at bottom. Now 100% complete on total dependencies.

Opencord upstreaming work

This is a list of patches on gerrit.opencord.org, obtained by filtering by the owner

Merged:

- Change 13803 - [CORD-3245] Add Arm64 Dockerfile Support for XOS-GUI
- Change 14161 - Modify alpine version to 3.9 for supporting Arm64
- Change 16284 - Pin mdl to 0.5.0 to fix packer basebuild

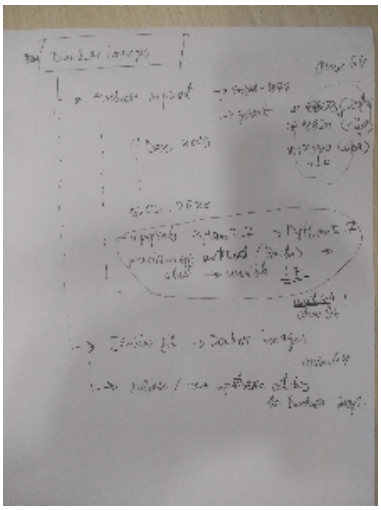
Open

- Change 14186 - [CORD-3246] Add support for docker build on arm64
- Change 14494 - [CORD-3247] Add support for docker build on Arm64
- Change 14628 - [CORD-3248]Add support for docker build on arm64
- Change 15235 - Add multi-arch support for alpine-grpc-base
- Change 13900 - Add arm64 support for xos-api-tester images build
- Change 15815 - Add multi-arch support for xos
- Change 16076 - [CORD-3251] Add multi-arch support for xos-rest-gw
- Change 14756 - Add arm64 support for voltha-netconf images build
- Change 14040 - Add arm64 support for voltha-base images build

- Change 14695 - Add arm64 support for voltha-ofagent images build

Other patches abandoned have not been listed here.

SEBA Upstreaming plan and outline



The drawing above corresponds to the initial plan outlined by Zack Williams from Open Networking Foundation, covered in the multi-arch brigade Technical starting points for the Multiarch brigade.

The rationale for doing this upstreaming work has been discussed in the CORD SEBA weekly meeting, you can listen to the recording 2019 07 02 SEBA Meeting.

Add support for ARM64 for the CORD Docker images

This is the initial goal, to be able to have continuous support for ARM64 for the Docker images that make up the CORD components. This is especially important since Opencord is moving very fast towards adding new functionality and improving the quality and scalability.
Subsequently, to achieve this we need to cover two bases:

Packer support for ARM64

This is needed because Opencord uses Packer built images as a build environment for the Docker images. The images are built as Amazon AWS ami images, so in fact when a Docker image is built, an AWS instance is spawned, and in here the docker build command is issued.

For the Packer ARM64 support work there are details in the Opencord JIRA SEBA-877. Further more, there were a few gerrit changes submitted to this end:

- https://gerrit.opencord.org/#/c/16608/ - Add pandoc and graphviz for documentation tasks - submitted by zdw@opennetworking.org
- https://gerrit.opencord.org/#/c/16624/ - Folllow up to the previous, submitted by ciprian.barbu@enea.com
- https://gerrit.opencord.org/#/c/17480/ - Add support for arm64 in Packer templates - submitted by ciprian.barbu@enea.com

Recently, more issues surfaced regarding this work, and now we need to add support to Python3, since Python2.7 is not supported anymore.

Also, since Opencord uses LF tools (releng-global-jjb and releng-common-packer), the incentive is to also move to the new Ansible provisioning method.

Jenkins Jobs for building Docker images

This is the actual work that enables ARM64 support for building the Docker images. It's not entirely clear now how to go about this, whether it means duplicating jobs or not, but as a reference here is the Jenkins job that builds and the VOLTHA images to Dockerhub voltha repository:

https://jenkins.opencord.org/job/voltha-publish/

Towards this end, we will need to re-work the list of initial patches sent to upstream, mentioned above. The patches have either gone stale, or do not fit well with the way the infrastructure works, and that is why at the moment those patches cannot be accepted in upstream.

Add support for ARM64 in upstream helm-charts

The Opencord project uses helm charts to deploy SEBA, and these are under version control in the helm-charts repository. Ideally we would want to be able to use the same repository once the Docker images are in place. This can probably be achieved by introducing custom yaml config scripts that will make the charts point to the correct Docker images for ARM64.