SAMSUNG

OOM ONAP Offline Installer

2019-06-11 Stockholm ONAP DDF

Presenters:
Michal Ptacek
Mateusz Pilat

Agenda

- Introduction
  - *Motivation*
  - *Architecture (as of 06/19)*
  - *Build & installation procedure as of now*
- What has changed since last DDF meeting
  - *Casablanca Installer fully based on Ansible*
  - *Integration tests introduction*
- Future plans for El-Alto and beyond
  - *Align closely offline installer with ONAP development*
  - *Proposals for new features for Offline Installer*
  - *Final goal*
  - *Challenges, concerns*
- Q&A

Part I. Introduction

Motivation

- Production deployments are not expected to be running from “online” source
- Need to have a control about what exactly is deployed (avoid surprises from latest code). Currently each online deployment can end-up with slightly different result.
- Should not be dependent on availability of all required online artifacts during installation or even runtime (e.g. nexus3.onap.org downtimes)

“We need to have a pre-populated platform, which can be used for any lab deployment in offline environments.”

Architecture of Offline Installer

- All artifacts* required during the deployment or even runtime must be accessible through the offline platform (i.e. pre-downloaded)

- Instead of patching whole ONAP and removing hardcoded URL's, the main idea of our offline solution is to simulate all internet servers required
  (using own nexus accessible via nginx used as reversed proxy)
  https://help.sonatype.com/repomanager3/installation/run-behind-a-reverse-proxy

- Artifacts lists are stored in text files and there is manual effort in updating those data lists

* artifacts – docker images, npm packages, rpm packages, git repos, pip packages, files, …

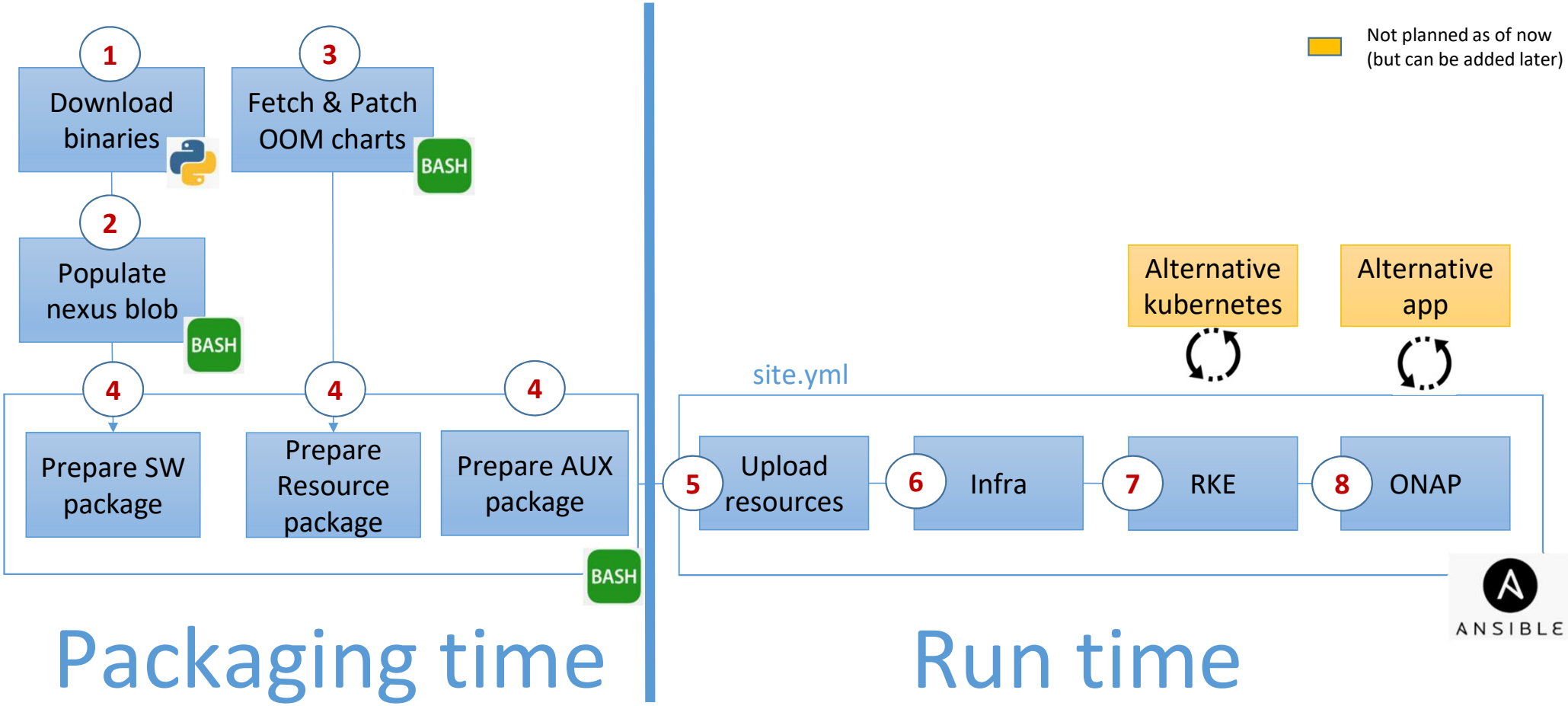
Simulated domains in Dublin

git: (git repos)
- gerrit.onap.org
- ~~git.rancher.io~~
- ~~github.com~~

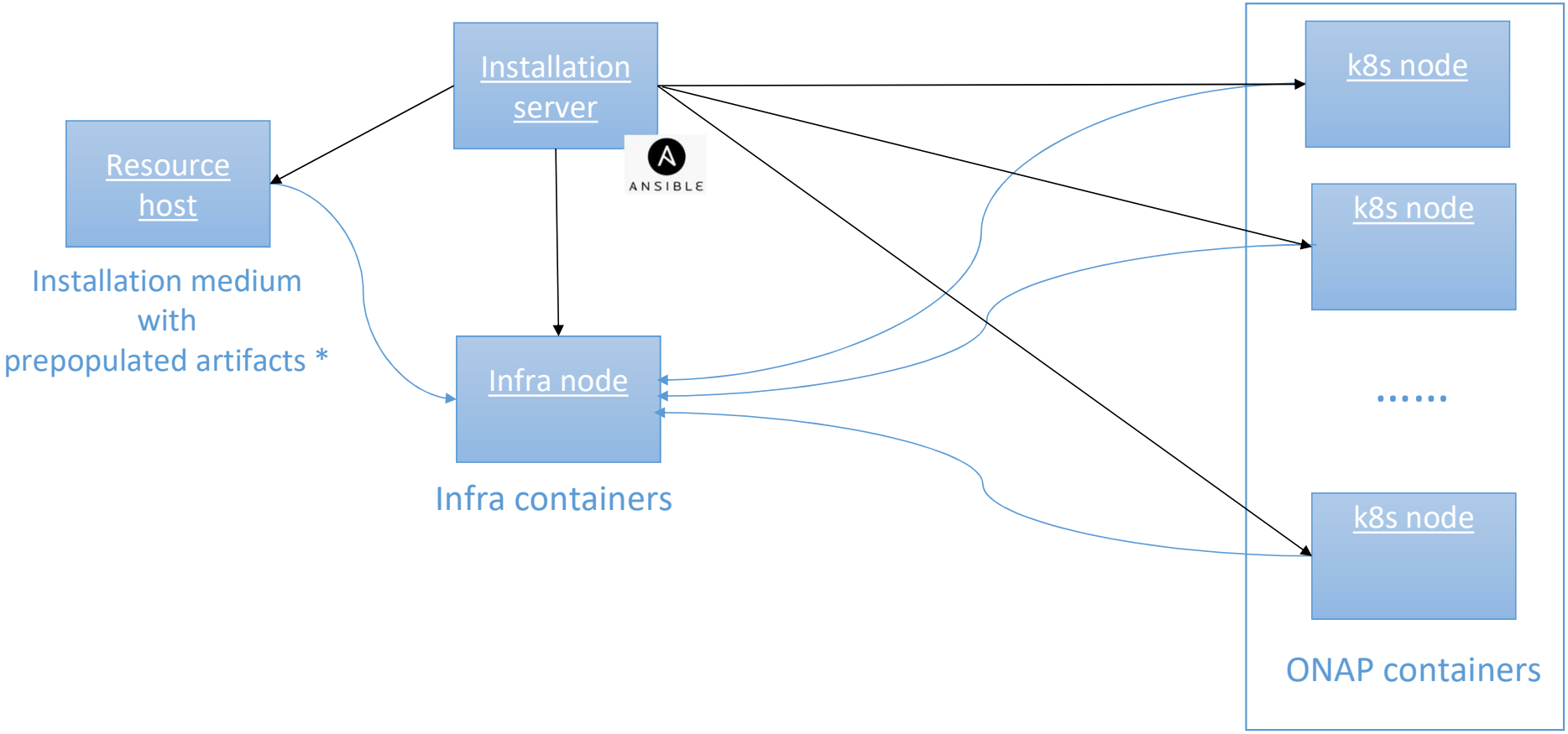
http: (maven artifacts)
- git.onap.org
- nexus.onap.org
- repo.infra-server
- www.getcloudify.org
- www.springframework.org
- repo.maven.apache.org
- repo1.maven.org

nexus: (docker images, npm & pip)
- docker.elastic.co
- docker.io
- index.docker.io
- gcr.io
- k8s.gcr.io
- nexus.{{ ansible_nodename }}
- nexus3.onap.org
- pndareg.ctao6.net
- quay.io
- registry-1.docker.io
- registry.hub.docker.com
- registry.npmjs.org

Offline installer in Dublin – Build & Installation procedure

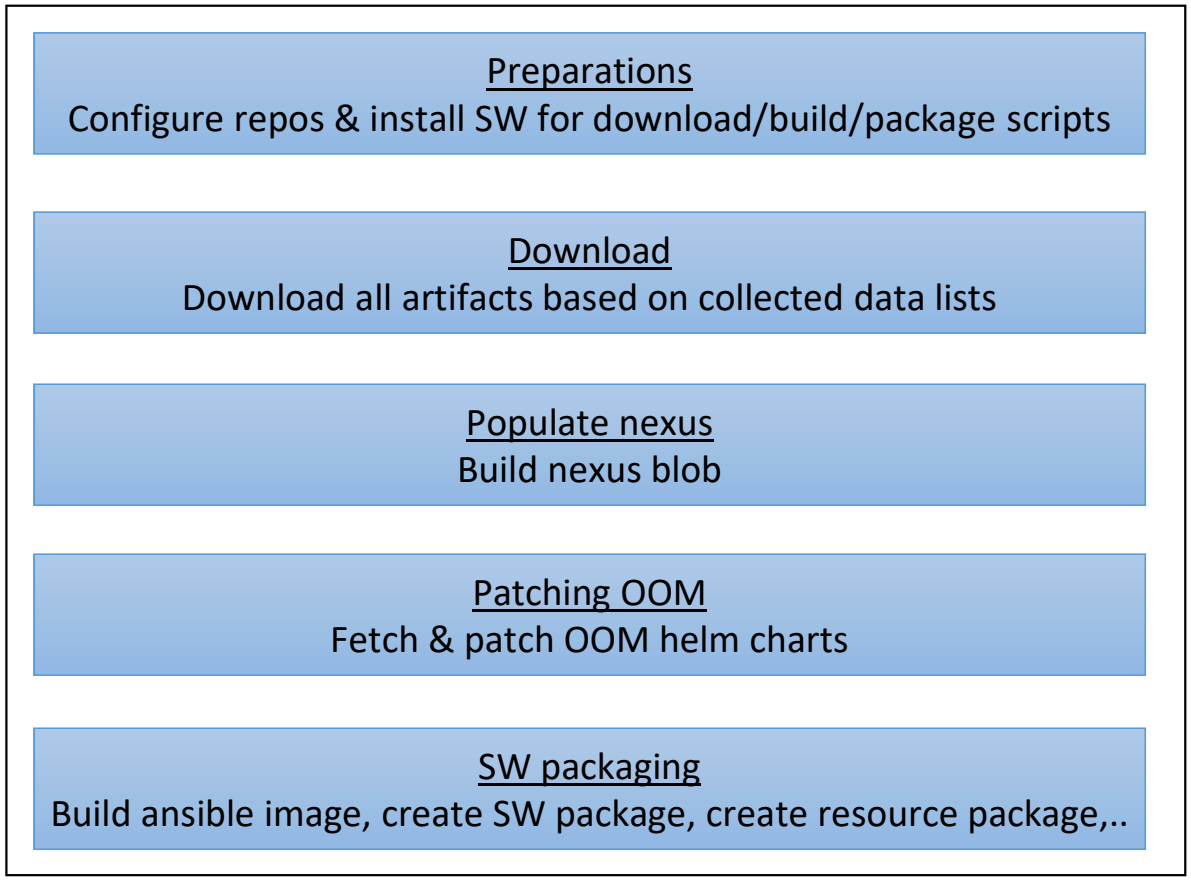


Offline installation scheme



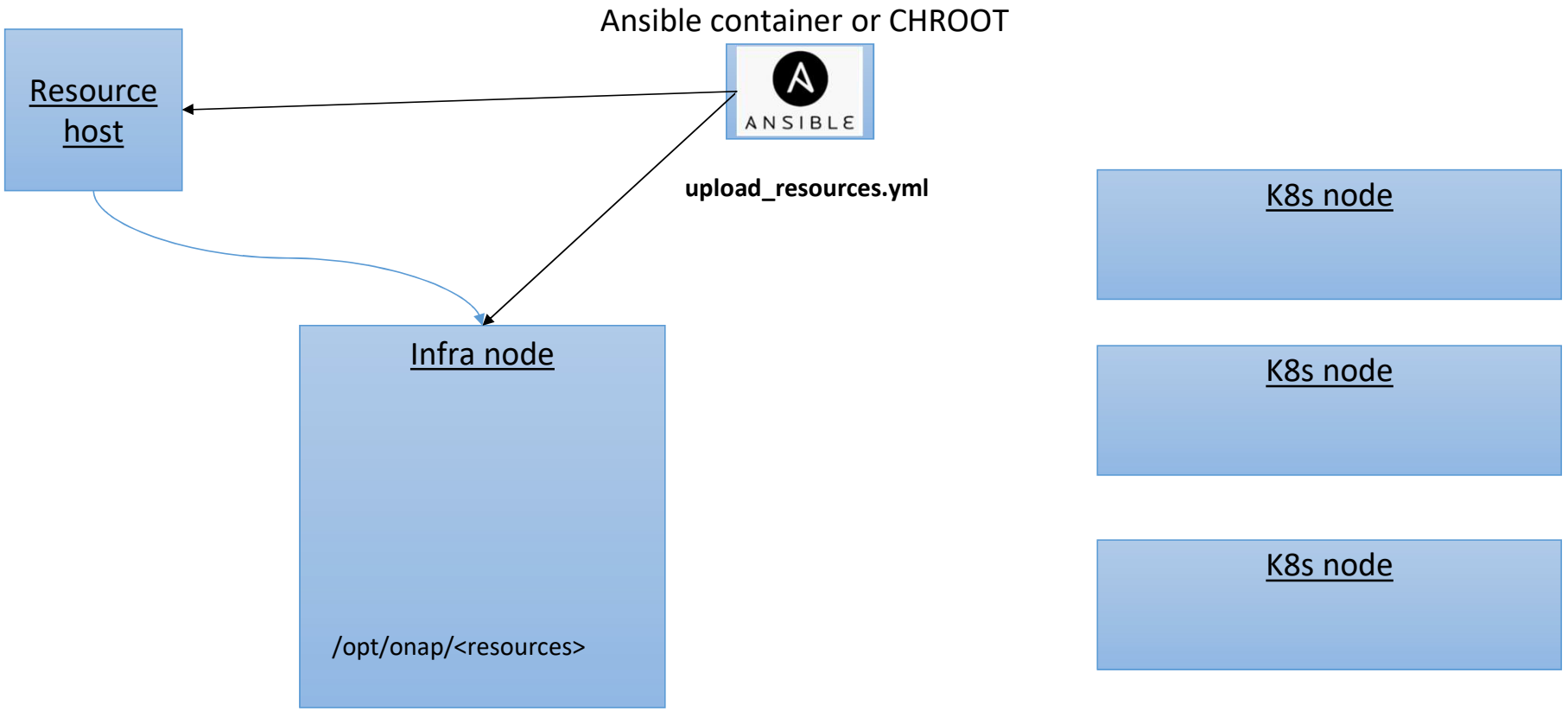
* during installation all artifacts are copied into infra node, resource host and install server are not needed in runtime

Platform build procedure

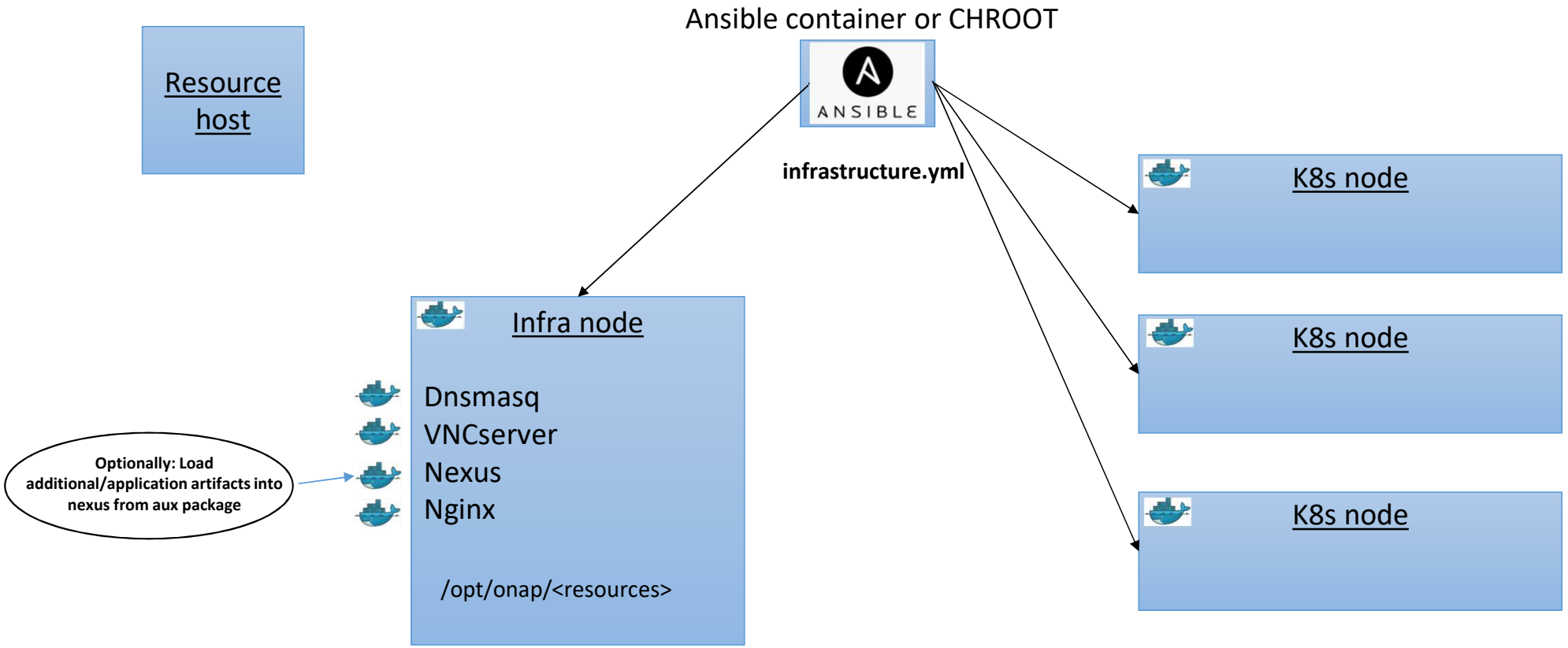


RHEL/Centos 7.6 build server

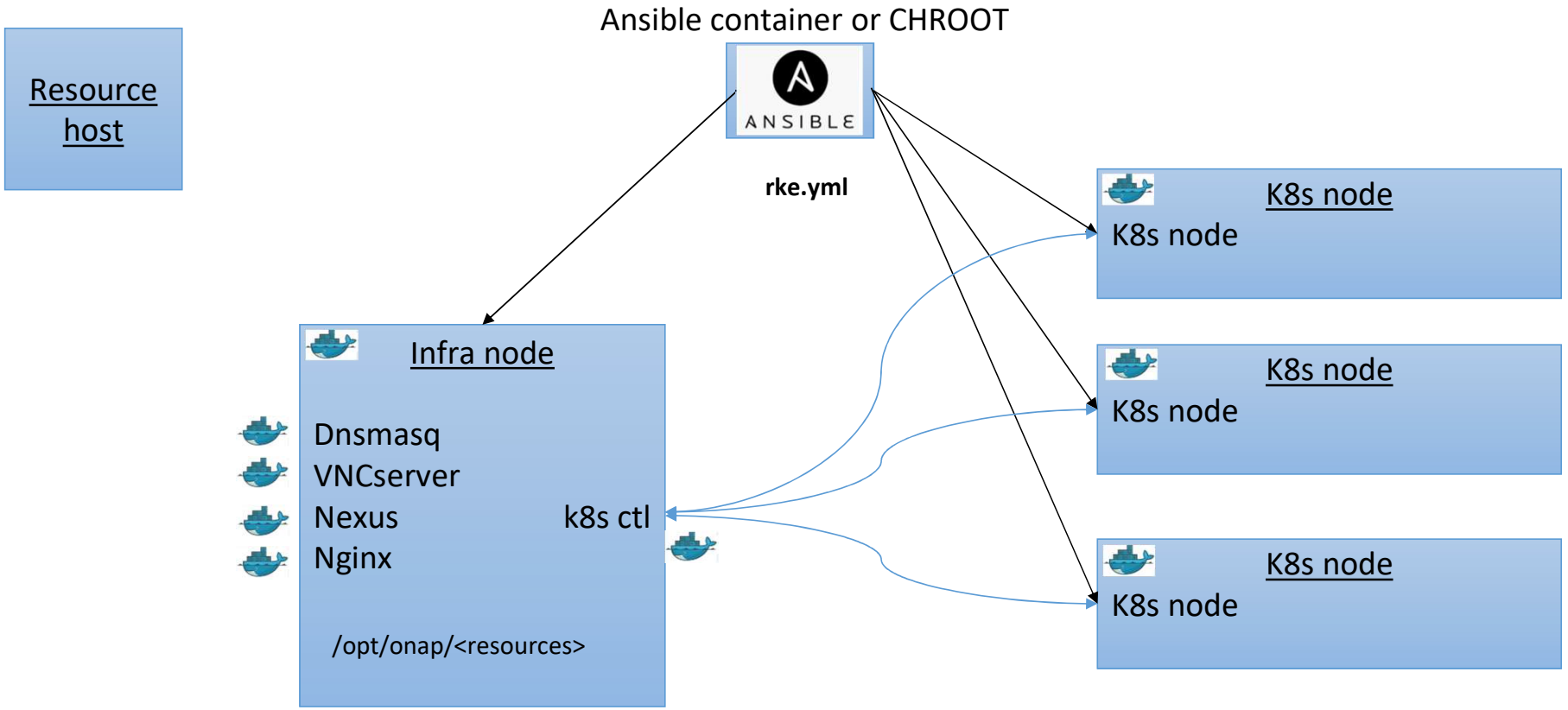
Installation procedure - upload resources



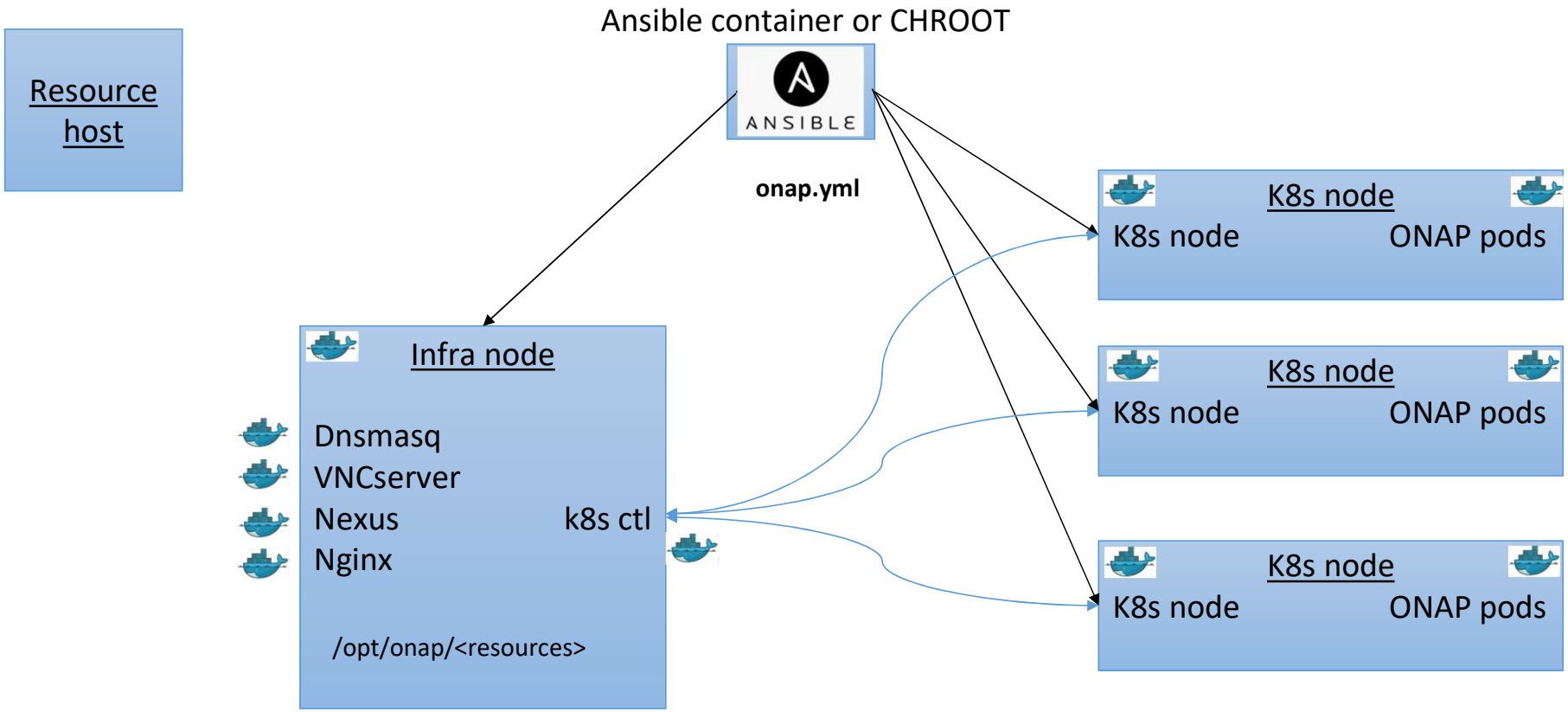
Installation procedure - infrastructure deployment



Installation procedure - deploy k8s cluster



Installation procedure - deploy onap using OOM charts



Part II. What has changed since last DDF in Nozay

Installer redesign finished

- In Beijing we had working prototype of ansible offline installer
- In Casablanca complete solution was verified on top of 3.0.2 with vFWCL demo – notes published

https://gerrit.onap.org/r/gitweb?p=oom/offline-installer.git;a=blob;f=docs/vFWCL-notes.rst;h=690b6dc9ec3c19cc225f6f495c8711b098f91008;hb=refs/heads/casablanca

Rebase from Casablanca to Dublin was much easier due to improved maturity of offline solution (we started testing with RC0 not after sign-off like it was in Casablanca)

New functionality:

- Role separation for each deployment stage (we benefit from that already in Dublin when replacing rancher with RKE)
- Kubernetes control plane can now be installed outside of infra node
- Added support for generic override file for helm charts
- Redesign of download scripting (more reliable, python based)

Automatic ONAP offline platform creation

- Tracked in OOM-1876 - Introduce fully automated ONAP offline platform builds in CI

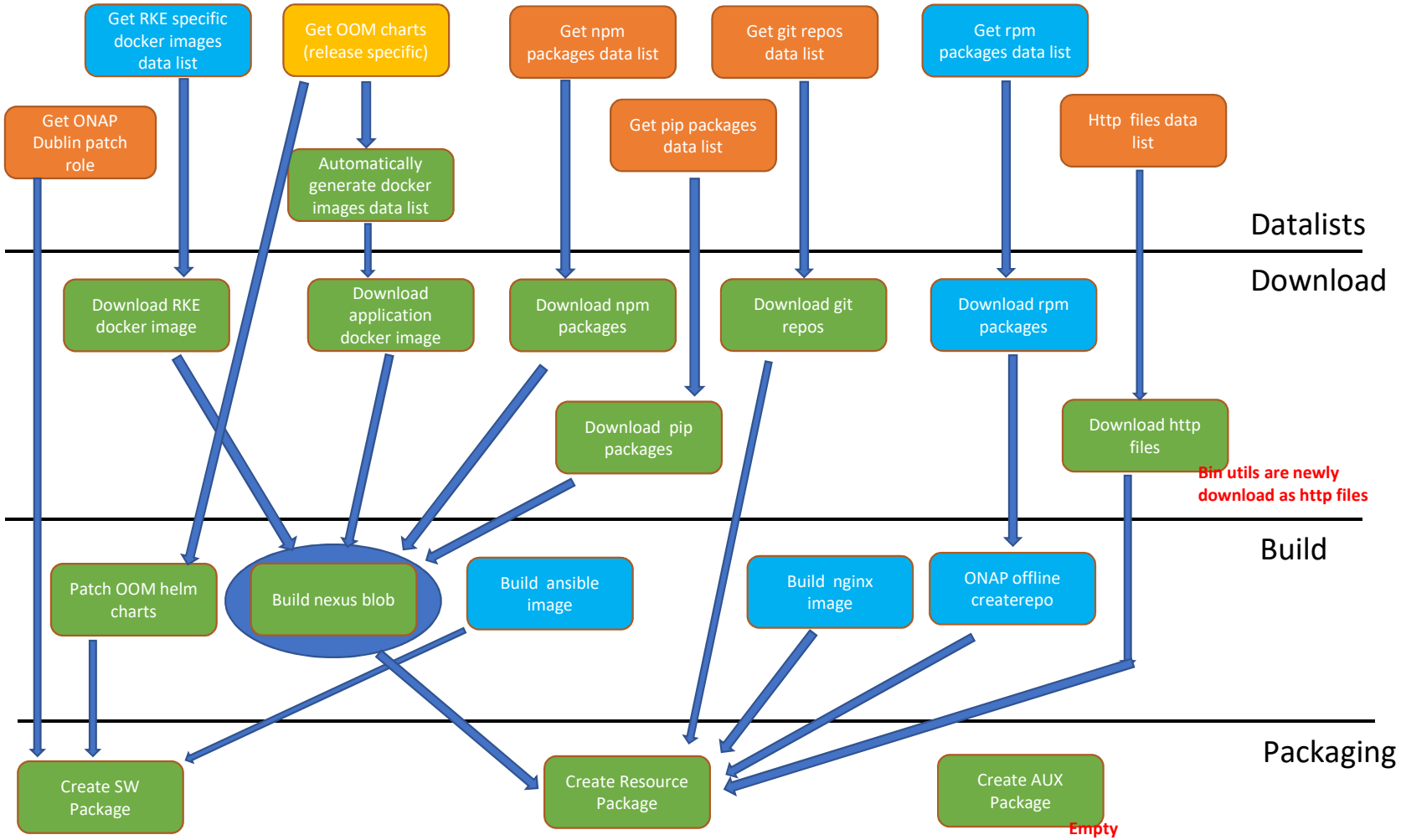
Motivation “our goal in Dublin was to work more closely with community and start testing with RC0”, due to frequent changes of OOM charts building platform on top of that was like shooting moving target”

=> fully automated ONAP offline platform solution need to be adopted

Two types of inputs for offline platform:

good one’s – OOM charts, offline platform specific images & packages
bad ones’s – other artifacts required by various ONAP projects during install time & mostly runtime (we are trying to get rid of bad one’s together with community CCSDK-1117, SDNC-685, ~~APPC-1441~~, ~~DCAEGEN2-1088~~, ~~POLICY-1576~~, ~~SO-1917~~, OPTFRA-509, …)

Automatically generated ONAP Offline Platform (Dublin)



Legend

- ONAP app Inputs – OOM helm charts should be eventually the only application specific input for creating whole ONAP offline platform.
- ONAP app other Inputs – these parts are currently required for ONAP offline platform data build and we don't expect them to be changed frequently. They are currently manually prepared. Our stretch goal is to get rid of all those inputs together with community. So at the end there will be just OOM charts and docker images will be produced out of this
- Offline infrastructure inputs & tasks – rpms and RKE is an example k8s cluster provider
- Tasks – needs to be processed fully automatically (in CI chain)

Offline deployments testing

Current community testing

- Molecule syntax & functional testing
  https://github.com/ansible/molecule
  https://molecule.readthedocs.io/en/latest/index.html

  Tests triggered by offline-installer-master-review job for every relevant offline installer patch in gerrit
  https://jenkins.onap.org/view/01-Recent/job/offline-installer-master-review/

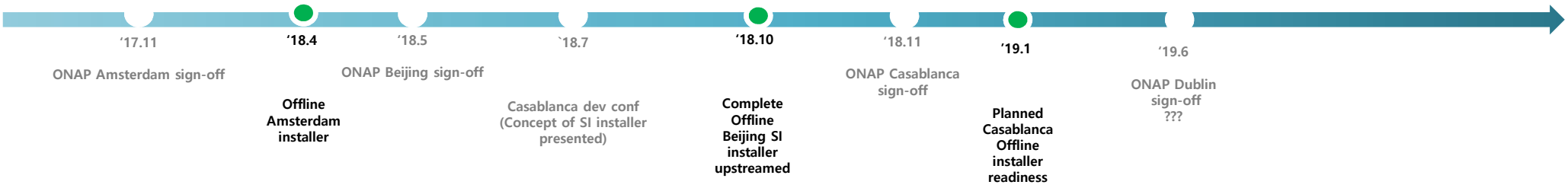
CI nightly execution in Samsung Poland lab (upstreaming planned)

- Adding download into CI pipeline OOM-1849
- Adding nexus blob build into CI pipeline OOM-1848
- Execution of robot HC's from offline installer OOM-1806

Part III. Future plans for El-Alto and beyond

Future plans for El-Alto and beyond

- Align closely offline installer with ONAP development
  - General concept
  - Offline Installer CICD processes
  - Fully automated platform builds
  - CI installer
- Proposals for new features for Offline Installer
- Challenges, concerns



Current Offline Installer delivery process

- Current offline installer delivery process:
  - Focused on major releases
  - Partially manual gathering and maintaining list of artefacts
  - Always behind latest changes
  - Slow adaptation to changes

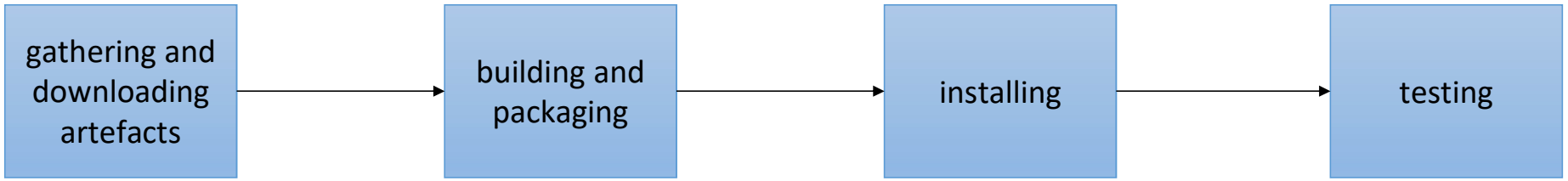
Goals for Offline Installer delivery process

- Planned improvements:
  - Closely tied up with oom repository (at least to the „latest stable”)
  - Frequent builds to quickly detect problems
  - Quick reaction to any detected issues
  - Automated artefacts gathering (where possible)
  - Continuing effort to remove online dependencies (where possible)

Offline Installer CI/CD processes - status overview

	Package preparation	*Installation*
Unit Test	*To do*	*Done*
Integration Test	*To do*	*Done*
System Test	*Partially done*	
Acceptance Test	*Parallel to online deployment*	

Offline Installer CI/CD processes - System Test overview

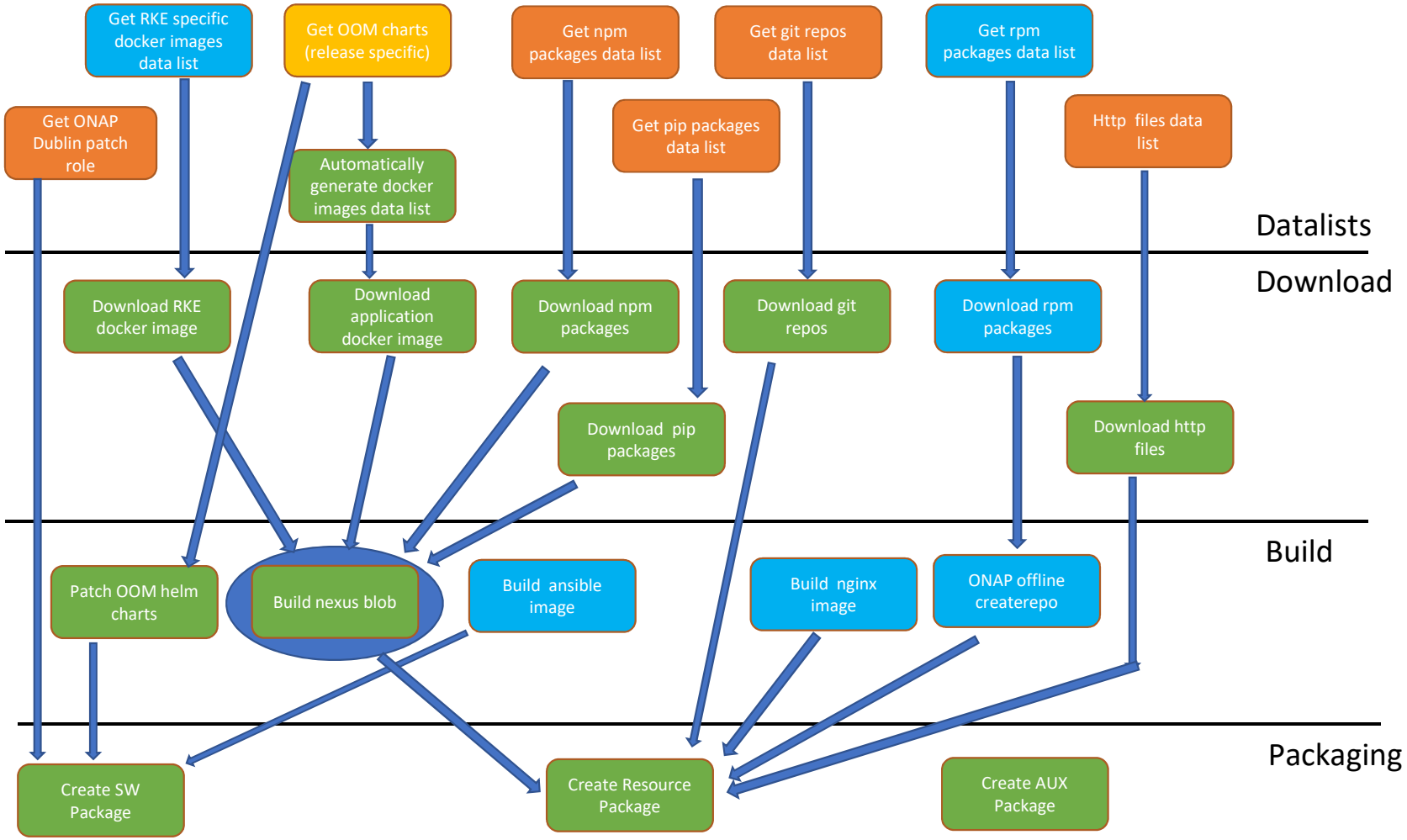


Fully automated platform builds

- There are manually inserted inputs for the offline installer platform (usually for not often changing parts) . Goal is to remove as many of them as possible.

ONAP Offline Platform should continuously evolve, most of the manual inputs for builds should turn to void, what remains should be directly obtainable from the helm charts

Automatically generated ONAP Offline Platform (Dublin)



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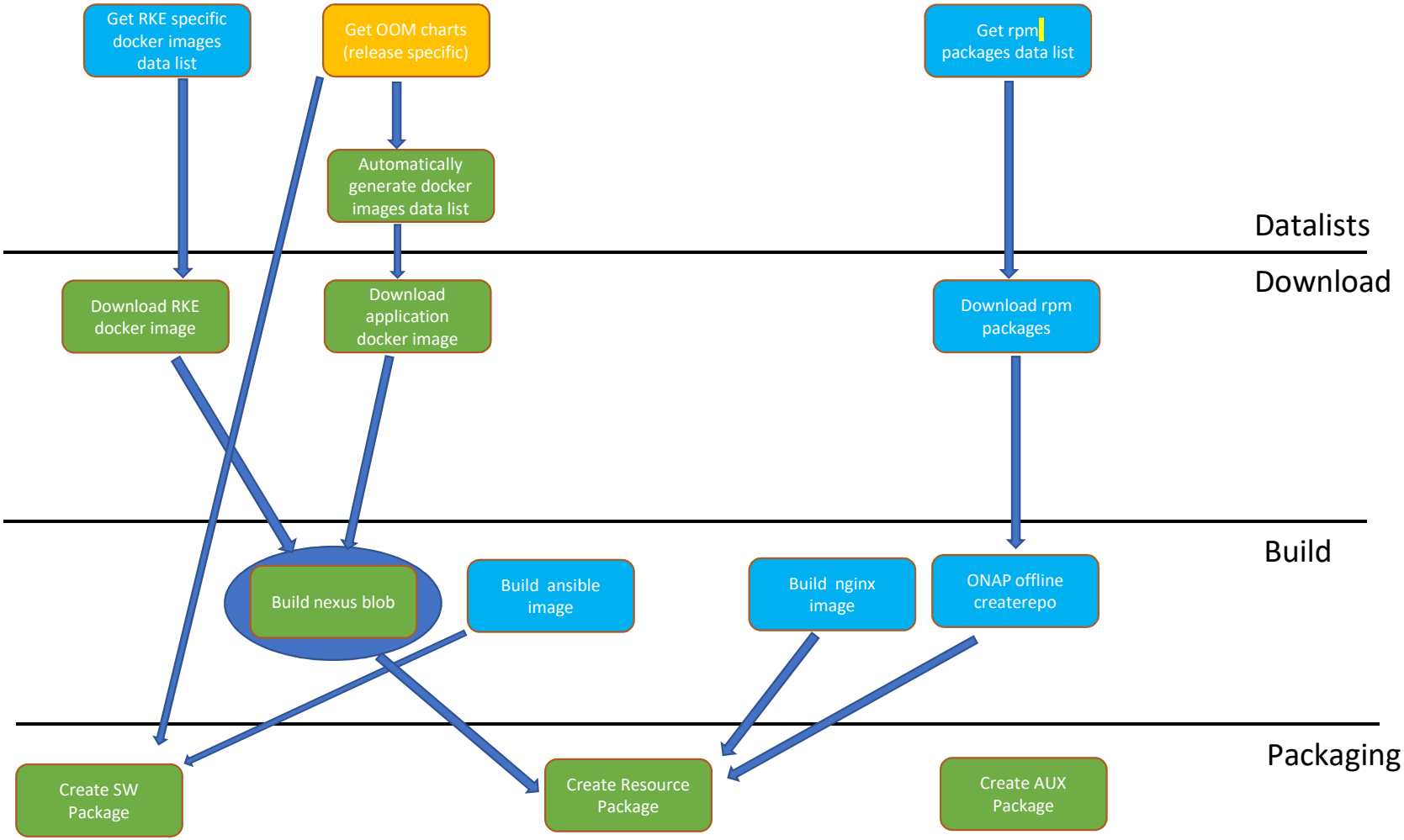
- Tasks – needs to be processed fully automatically (in CI chain)

Automatically generated ONAP Offline Platform (El-Alto and beyond)



Legend

ONAP app Inputs – OOM helm charts should be eventually the only application specific input for creating whole ONAP offline platform.

Offline infrastructure inputs & tasks – rpms and RKE is an example k8s cluster provider

Tasks – needs to be processed fully automatically (in CI chain)

Removing runtime dependencies along with community

- By having fast feedback from offline installer CI nightly, all attempts to introduce additional runtime dependency will be detected and analyzed together with appropriate ONAP project

  Subsequently decisions will be taken whether it's feasible to do it better (e.g. adding pip package to dockerfile instead of adding shell script for runtime with pip install) OR offline platform has to be readjusted.

  All such issues will be visible earlier and pressure for "making it more production ready" will be raising.

Example of solved issues:
~~APPC-1441~~, ~~DCAEGEN2-1088~~, ~~POLICY-1576~~, ~~SO-1917~~

Example of currently opened issues:
CCSDK-1117, SDNC-685, OPTFRA-509

Upstreaming Offline Installer CI/CD

- Offline Installer CI/CD processes
  - One of our biggest goals for El-Alto is to upstream to the community whole CI nightly builds solution for offline installer (inc. parts which are now developed for Dublin)

- Open question:
  - At which stage integrate it with ONAP life cycle?
  - Under which project should it be stored?
  - HW requirements are considerable (storage, bandwidth, RAM, CPU) - will there be room for it?

Extending offline installer with proprietary components

- Motivation:

ONAP is supposed to be commercialized by many vendors , each will have its own add-ons, standards and customizations. It would be beneficial if Offline Installer could prepare framework to deliver and deploy such components.

- Example use case:

Custom dashboard for monitoring ONAP components

- Proposition of implementation:

Add to Offline Installer functionality to create application consisting ONAP and additional packages. Prepare packaging scripts to build such product and installer to installation it.

Upgrades in ONAP offline deployment

- Motivation:

Currently there is no procedure to upgrade ONAP installed with Offline Installer. The goal of this feature is to deliver a framework for generating and delivering upgrade package.

- Propositions of implementation:

- *Add additional functionality to packaging that will compare two configurations, extract differences and create artefacts to be updated and removed.*

or

- *Generate new package*

In both cases Installation process will be extended with feature to deliver new package, process upgrade, rollback or remove outdated artefacts, depending on the upgrade result

The Vision for Offline Installer

2018

Year of Start

First offline ONAP deployments

vFWCL functional check added

Create offline platform from data lists

2019

Year of Evolution

Offline installer officially part of ONAP community under OOM project umbrella

Evolving from manually created to auto-generated

data lists

Working closely with community to remove runtime/install time add-ons

2020

Year of Success

Offline deployment compatibility feature adopted by ONAP projects

Footprint of offline artifacts decreased the bare minimum (just automatically generated docker image list is needed for offline deployments) – no git repos, http files, npm packages

Violation of offline compatibility checked by upstream jenkins jobs – jobs are maintained, people notified

Challenges, concerns

- There is no straightforward way how to analyze all online dependencies, our direction is to speed-up detection of such violations, but still it require reverse engineering if new dependency is introduced.

- Avoid patching OOM helm charts and do offline installer specific setup directly in OOM
  (e.g. root certificate distribution, application specific stuff related to offline setup, ..)
https://gerrit.onap.org/r/gitweb?p=oom/offline-installer.git;a=blob_plain;f=patches/offline-changes.patch;hb=refs/heads/master

- Capacity - Team size

Top 10 contributors

Tomas Levora	t.levora@partner.samsung.com
Petr Ospaly	p.ospaly@partner.samsung.com
Samuli Silvius	s.silvius@partner.samsung.com
Michal Ptacek	m.ptacek@partner.samsung.com
Michal Zegan	m.zegan@samsung.com
Bartlomiej Grzybowski	b.grzybowski@partner.samsung.com
Milan Verespej	m.verespej@partner.samsung.com
Mateusz Pilat	m.pilat@partner.samsung.com
Ronan Keogh	ronan.keogh@est.tech
Lasse Kaihlavirta	l.kaihlavirt@partner.samsung.com

Q&A

Questions?

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THANK YOU

Presenters:
Michal Ptacek
Mateusz Pilat