DASH Testing Workflows v3
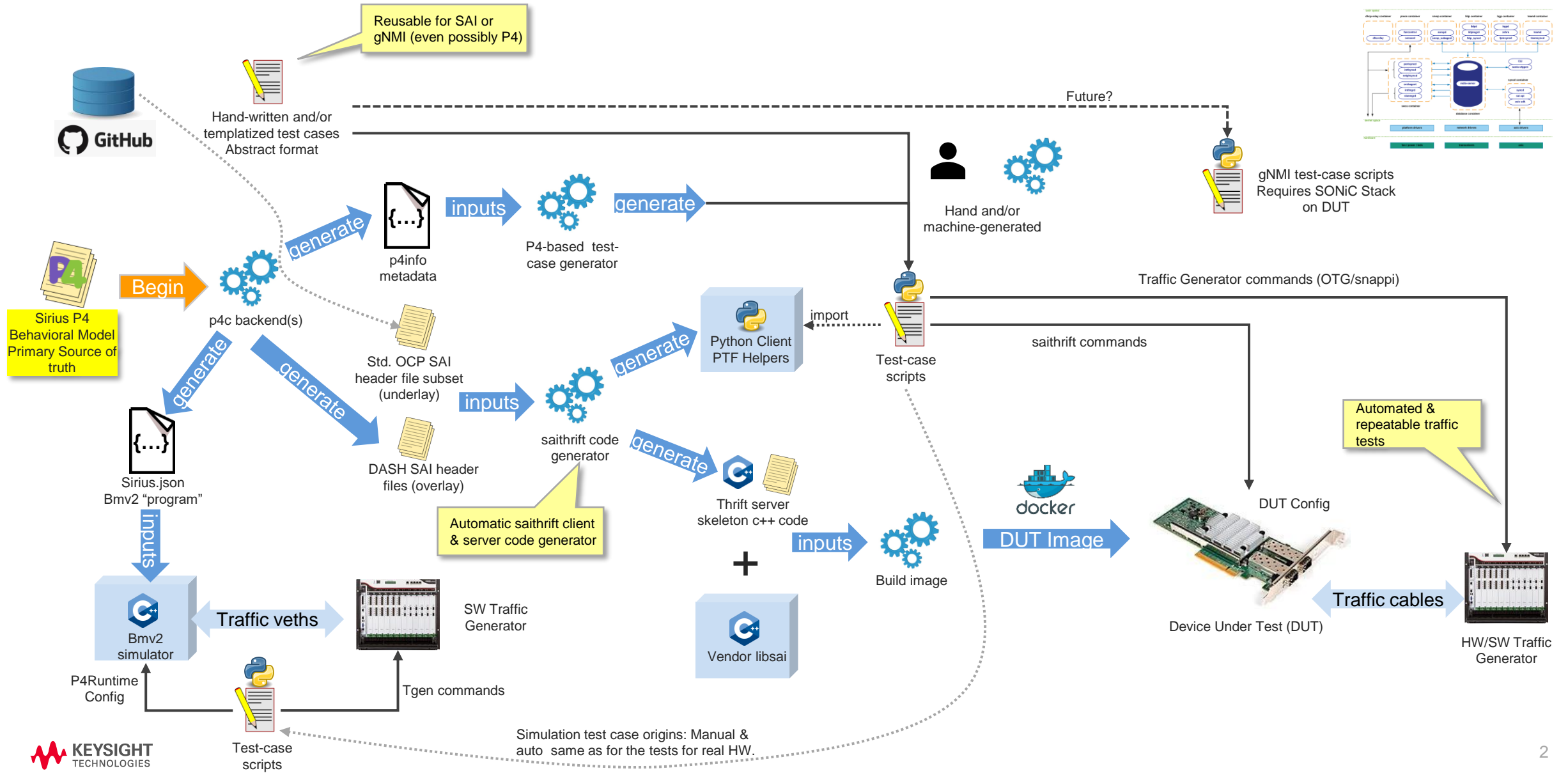
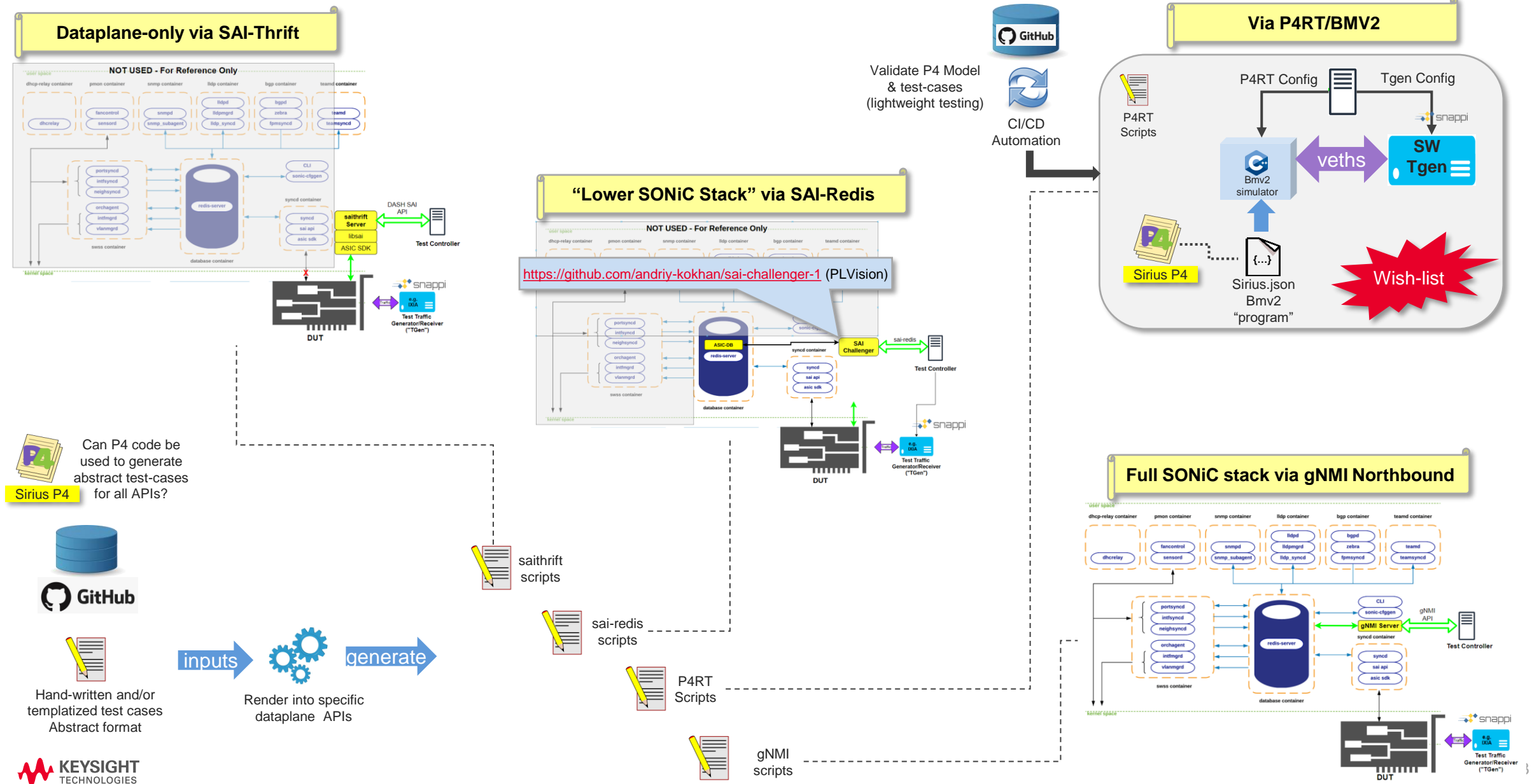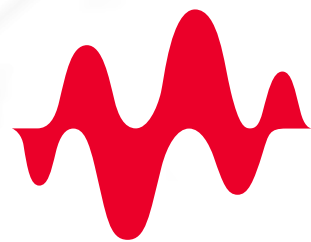| Chris Sommers	2021.11.17
SW Architect	

KEYSIGHT
TECHNOLOGIES

Idealized DASH Test Workflow – using P4 & saithrift

Reusable for SAI or gNMI (even possibly P4)

Hand-written and/or templatized test cases Abstract format

GitHub

Future?

gNMI test-case scripts Requires SONiC Stack on DUT

inputs generate

P4-based test-case generator

Hand and/or machine-generated

Traffic Generator commands (OTG/snappi)

Begin

Sirius P4 Behavioral Model Primary Source of truth

p4c backend(s)

generate

p4info metadata

generate

Std. OCP SAI header file subset (underlay)

inputs

generate

Python Client PTF Helpers

import

Test-case scripts

saithrift commands

generate

DASH SAI header files (overlay)

saithrift code generator

generate

Thrift server skeleton c++ code

Automated & repeatable traffic tests

generate

Sirius.json Bmv2 "program"

inputs

Automatic saithrift client & server code generator

+

inputs

Build image

docker

DUT Image

DUT Config

Bmv2 simulator

Traffic veths

SW Traffic Generator

Vendor libsai

Device Under Test (DUT)

Traffic cables

HW/SW Traffic Generator

P4Runtime Config

Tgen commands

Test-case scripts

Simulation test case origins: Manual & auto same as for the tests for real HW.

KEYSIGHT TECHNOLOGIES

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Progressive DASH Dataplane Testing through the layers

Dataplane-only via SAI-Thrift

DASH SAI API

"Lower SONiC Stack" via SAI-Redis

https://github.com/andriy-kokhan/sai-challenger-1 (PLVision)

Validate P4 Model & test-cases (lightweight testing)

CI/CD Automation

Via P4RT/BMV2

P4RT Config   Tgen Config

P4RT Scripts

Sirius P4

Bmv2 simulator   veths   SW Tgen

Sirius.json Bmv2 "program"

Wish-list

Can P4 code be used to generate abstract test-cases for all APIs?

Sirius P4

Full SONiC stack via gNMI Northbound

gNMI API

saithrift scripts

sai-redis scripts

inputs   generate

Render into specific dataplane APIs

P4RT Scripts

Hand-written and/or templatized test cases Abstract format

gNMI scripts

KEYSIGHT TECHNOLOGIES