

# Devlink Health

## Background

The `devlink` health mechanism is targeted for Real Time Alerting, in order to know when something bad happened to a PCI device.

- Provide alert debug information.
- Self healing
- If problem needs vendor support, provide a way to gather all needed debugging information.

## Overview

The main idea is to unify and centralize driver health reports in the generic `devlink` instance and allow the user to set different attributes of the health reporting and recovery procedures.

The `devlink` health reporter: Device driver creates a "health reporter" per each error/health type. Error/Health type can be a known/generic (e.g. PCI error, fw error, rx/tx error) or unknown (driver specific). For each registered health reporter a driver can issue error/health reports asynchronously. All health reports handling is done by `devlink`. Device driver can provide specific callbacks for each "health reporter", e.g.:

- Recovery procedures
- Diagnostics procedures
- Object dump procedures
- OOB initial parameters

Different parts of the driver can register different types of health reporters with different handlers.

## Actions

Once an error is reported, `devlink` health will perform the following actions:

- A log is being send to the kernel trace events buffer
- Health status and statistics are being updated for the reporter instance
- Object dump is being taken and saved at the reporter instance (as long as there is no other dump which is already stored)
- Auto recovery attempt is being done. Depends on:
  - Auto-recovery configuration
  - Grace period vs. time passed since last recover

## User Interface

User can access/change each reporter's parameters and driver specific callbacks via `devlink`, e.g. per error type (per health reporter):

- Configure reporter's generic parameters (like: disable/enable auto recovery)
- Invoke recovery procedure
- Run diagnostics
- Object dump

List of `devlink` health interfaces

Name	Description
<code>DEVLINK_CMD_HEALTH_REPORTER_GET</code>	Retrieves status and configuration info per DEV and reporter.
<code>DEVLINK_CMD_HEALTH_REPORTER_SET</code>	Allows reporter-related configuration setting.
<code>DEVLINK_CMD_HEALTH_REPORTER_RECOVER</code>	Triggers reporter's recovery procedure.
<code>DEVLINK_CMD_HEALTH_REPORTER_TEST</code>	Triggers a fake health event on the reporter. The effects of the test event in terms of recovery flow should follow closely that of a real event.
<code>DEVLINK_CMD_HEALTH_REPORTER_DIAGNOSE</code>	Retrieves current device state related to the reporter.
<code>DEVLINK_CMD_HEALTH_REPORTER_DUMP_GET</code>	Retrieves the last stored dump. Devlink health saves a single dump. If an dump is not already stored by devlink for this reporter, devlink generates a new dump. Dump output is defined by the reporter.
<code>DEVLINK_CMD_HEALTH_REPORTER_DUMP_CLEAR</code>	Clears the last saved dump file for the specified reporter.

The following diagram provides a general overview of `devlink-health`:

