OpenBMC Basic Thermal Design

Here is an initial list of the OpenBMC applications involved with the thermal control and monitoring. These are organized by the git repository name under openbmc and then subdivided into applications where necessary in bold.

phosphor-hwmon – with each sensor device driver utilized

- Provides the dbus interfaces to read the tach feedback for a fan
- Provides the dbus interfaces to set a fan target speed
- Provides the dbus interfaces for reading temperature sensors(ambient, core, dimm, etc...)

phosphor-inventory-manager

- A fan defined & found by the fan presence application(s) has an inventory object created
- Each fan inventory object contains:
  - Presence state property
  - Functional state property

phosphor-fan-presence(to be renamed to 'phosphor-fan')

- **presence**
  - Application(s) to create the inventory objects for the fans defined & found in the system
  - Updates the presence property on the inventory object for the fan when found not present
  - Will contain multiple presence detection style applications
    - tach feedback – detects fans as present when the tach feedback is non-zero
    - gpio*(TBD)* – detect fans using a gpio pin
    - gpio w/ tach fallback*(TBD)* – detect fans using a gpio pin and when unable, fallback to using the tach feedback to determine presence
- **control**
  - Listens for property changes of a defined set of dbus objects and algorithmically determine the fan target speed, writing it to the fan target speed dbus interfaces
  - This application is only meant to determine & write each fan target speed based on the defined set of inputs
- **monitor**
  - Listens for property changes of a defined set of fan sensor objects and calculates when a fan is determined to be faulted
  - Updates the corresponding fan inventory object's functional property with the functional state
- **cooling-type**
  - A one-time run application that sets a decorator on the chassis inventory object the cooling type(air, water) used by the system
  - This application updates that decorator by the given parameters provided, which include reading a gpio to determine the cooling type

phosphor-dbus-monitor

- A configurable application to perform the following actions given a set of conditions based on properties of a group of dbus objects' properties.
  - log an error
  - device callouts

    - shutdown system
- For example, in regard to thermal, this application could be configured to shutdown the system when a number of temperature sensors within a group exceed a defined temperature value.

“watchdog timer monitor”*(TBD)*

- Will control poking the watchdog timer on a defined interval and stop when one of its registered applications deem the watchdog should take over.
- In the case for fan control, the watchdog will put the fans to full speed when the timer expires after not being poked.