HuskySat-1: CDH Requirements

Definitions:

* CE: compute element, e.g. an MSP430, MSP432, or Raspberry Pi
* CS: core software – shared software that is common to all or most CE’s on the spacecraft
* CECS: compute element running core software

1. CECS must be capable of best-case operation under all **power conditions**.
   1. CECS’s – including all required peripherals – must be able to run properly at nominal voltages of **3.3V.**
   2. CECS’s must at all times **retain sufficient information to rebuild state in the event of unexpected/unplanned “sudden”** (no warning, no time to store state) power loss.
      1. Examples include some (though not all) parameters uploaded from the ground to set/change configuration on-orbit
      2. Each subsystem will have its own definition for what is “sufficient state”
   3. CECS must **not retain any state that would disallow the use of manual/intentional power cycling** as a means to return the CE to a “known good” state.
2. CECS must handle time-based data – including calculating and storing time, measuring events occurring over time, etc. – with minimal error (which varies depending on specific use case)
   1. “individual chip time”
   2. RTC?
   3. GPS clock and propagating that throughout s/c?
   4. MET?
   5. Stable enough throughout temp range
   6. Milliseconds vs microseconds?
3. CECS must allow reliable, timely exchange of information, both between devices within a module/subsystem, as well as throughout the s/c.
   1. CAN bus stuff …
   2. I2C bus stuff
   3. UART stuff …
   4. Noisy environments – PPT craziness?
4. CECS must be built in a manner that allows for maximun reliability
   1. Toolset freezes
   2. Debug backchannel
   3. TESTABILITY
5. CECS must work cleanly together with the larger system that forms the Ground Segment.
   1. COSMOS-y stuff here
   2. Integration stuff/flat sat as well?
6. Others:
   1. Other hardware (bsp hardware redirection)