

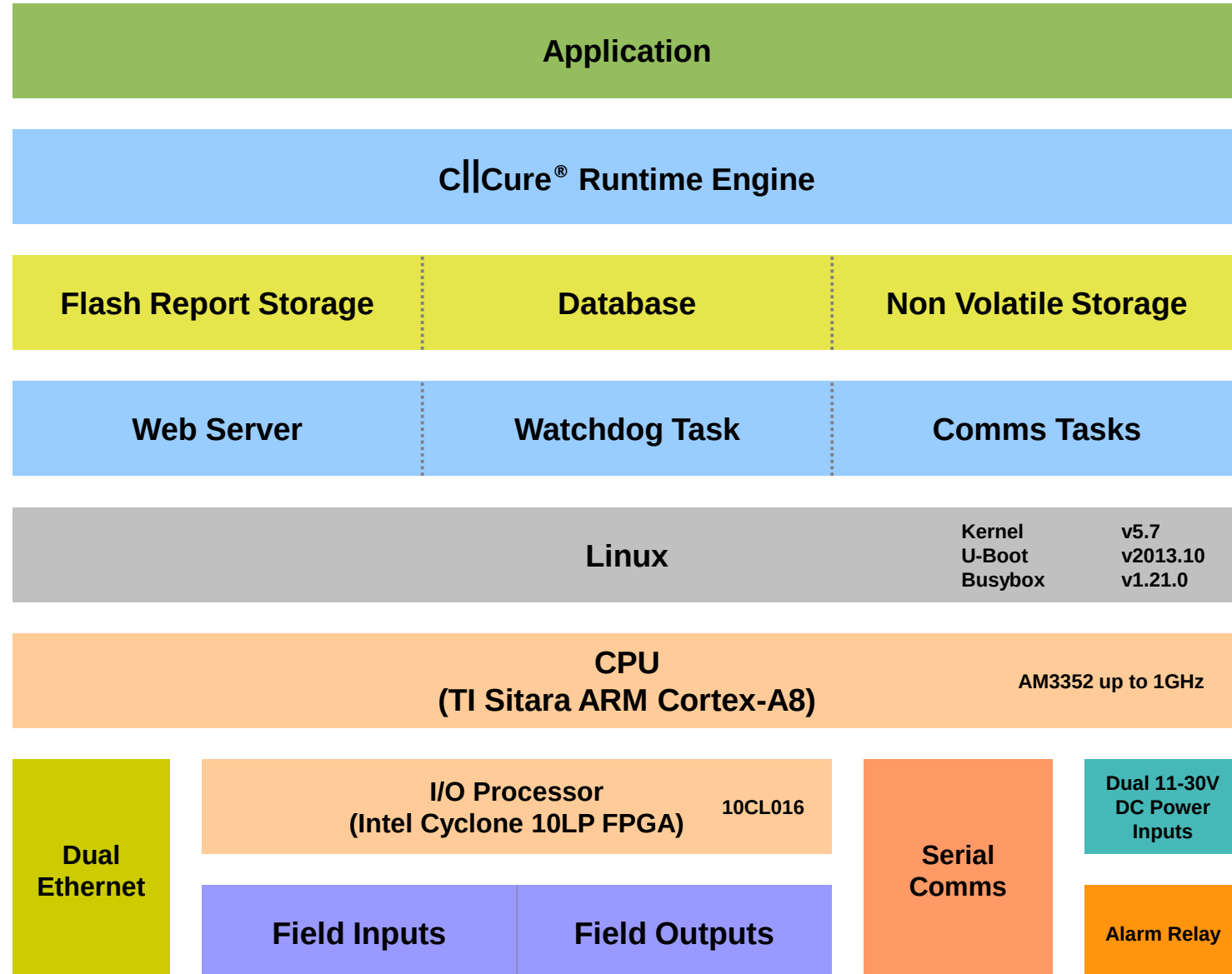
NANO™ 300 – Data Flow Architecture



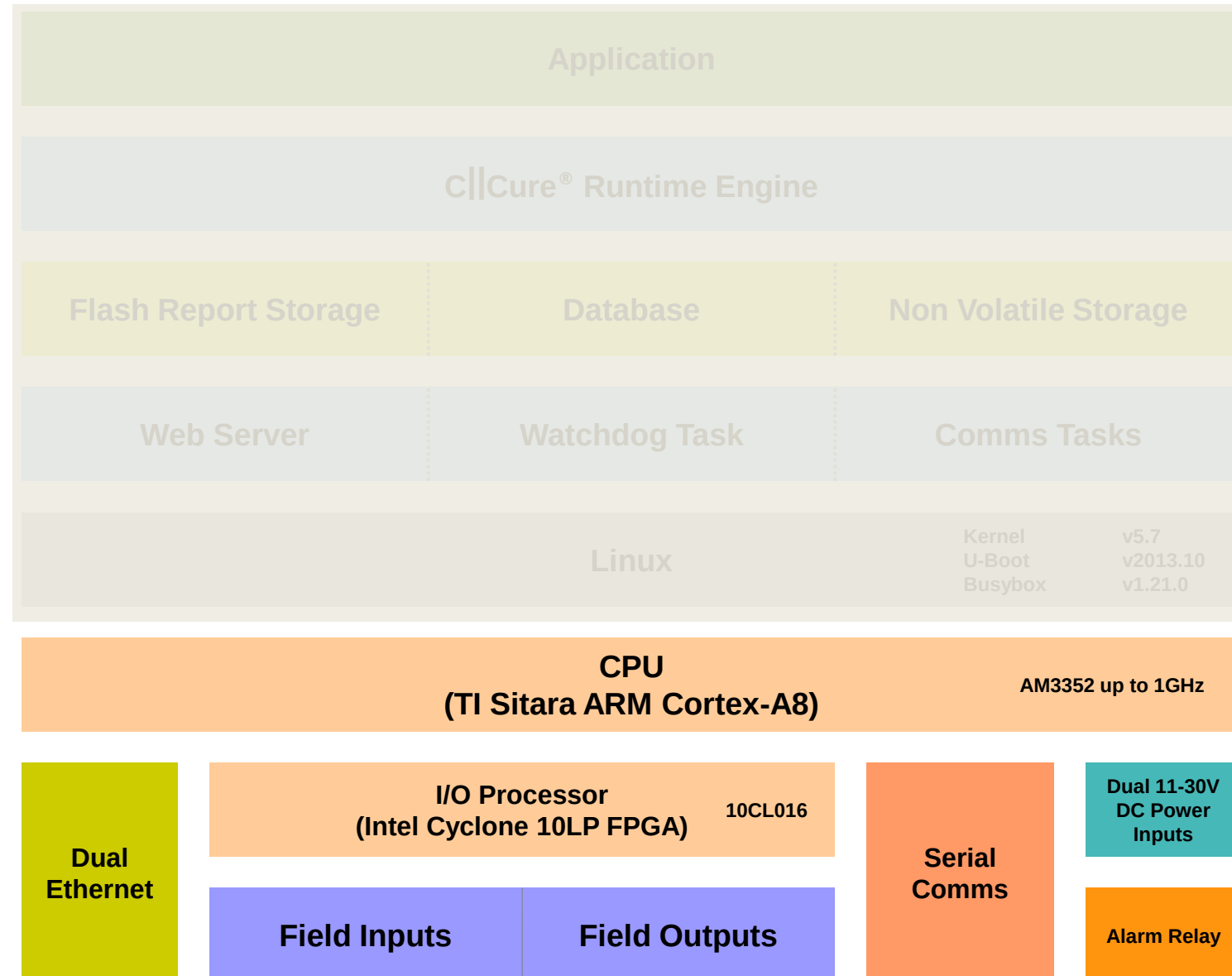
NANO™ 300 Flow Computer



System Overview

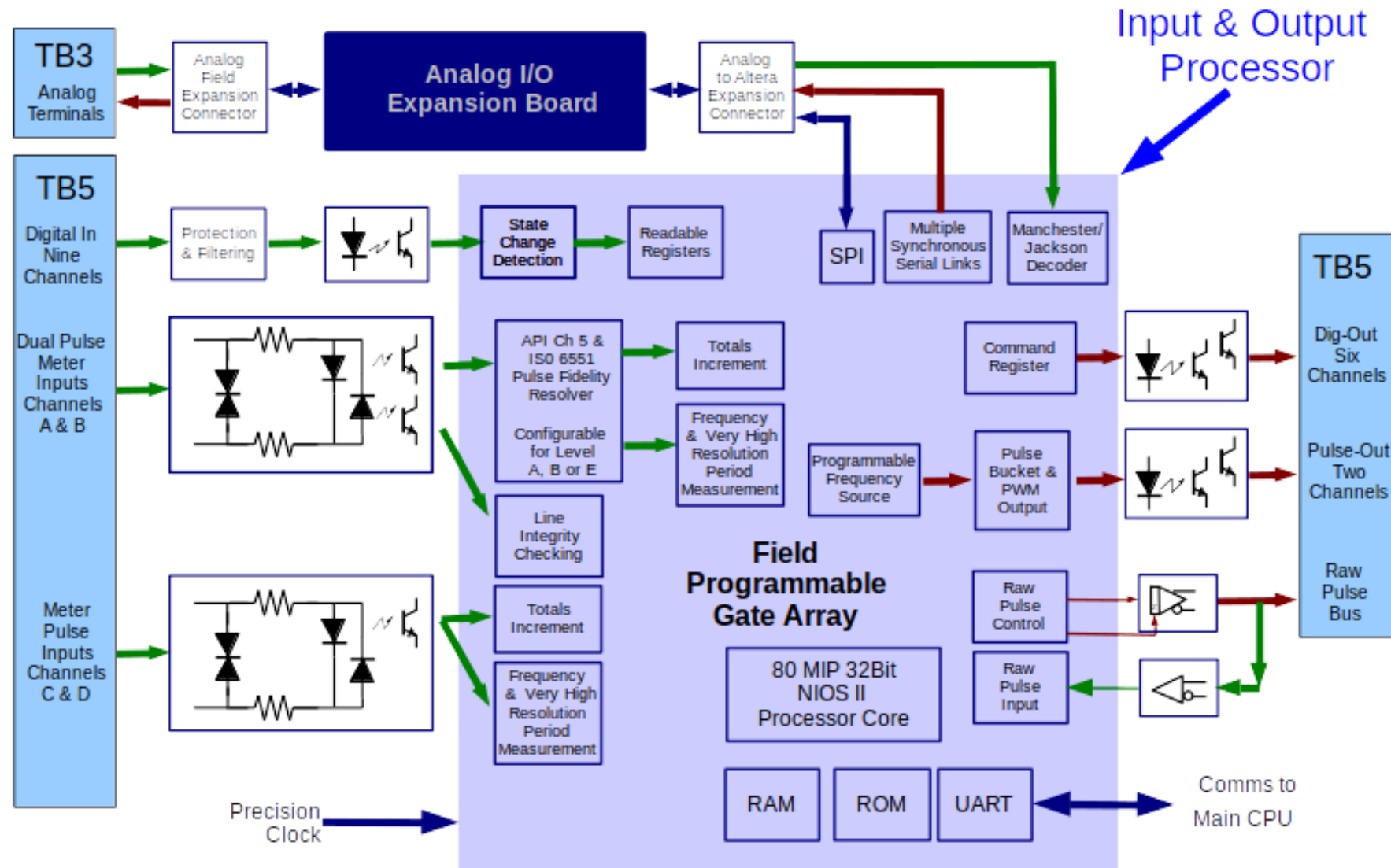


System Overview

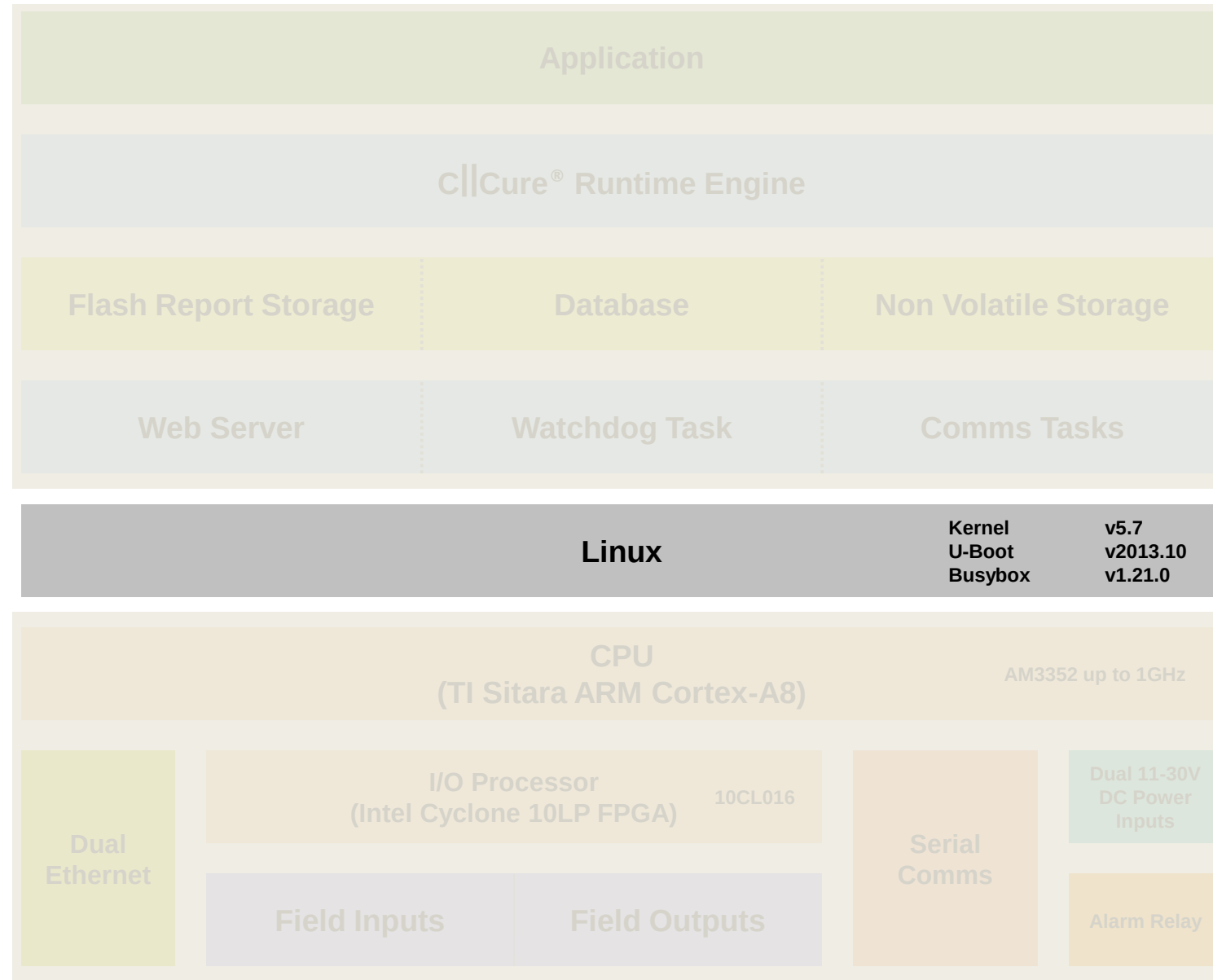


Field Inputs & Outputs

Gen3 Field I/O Block Diagram



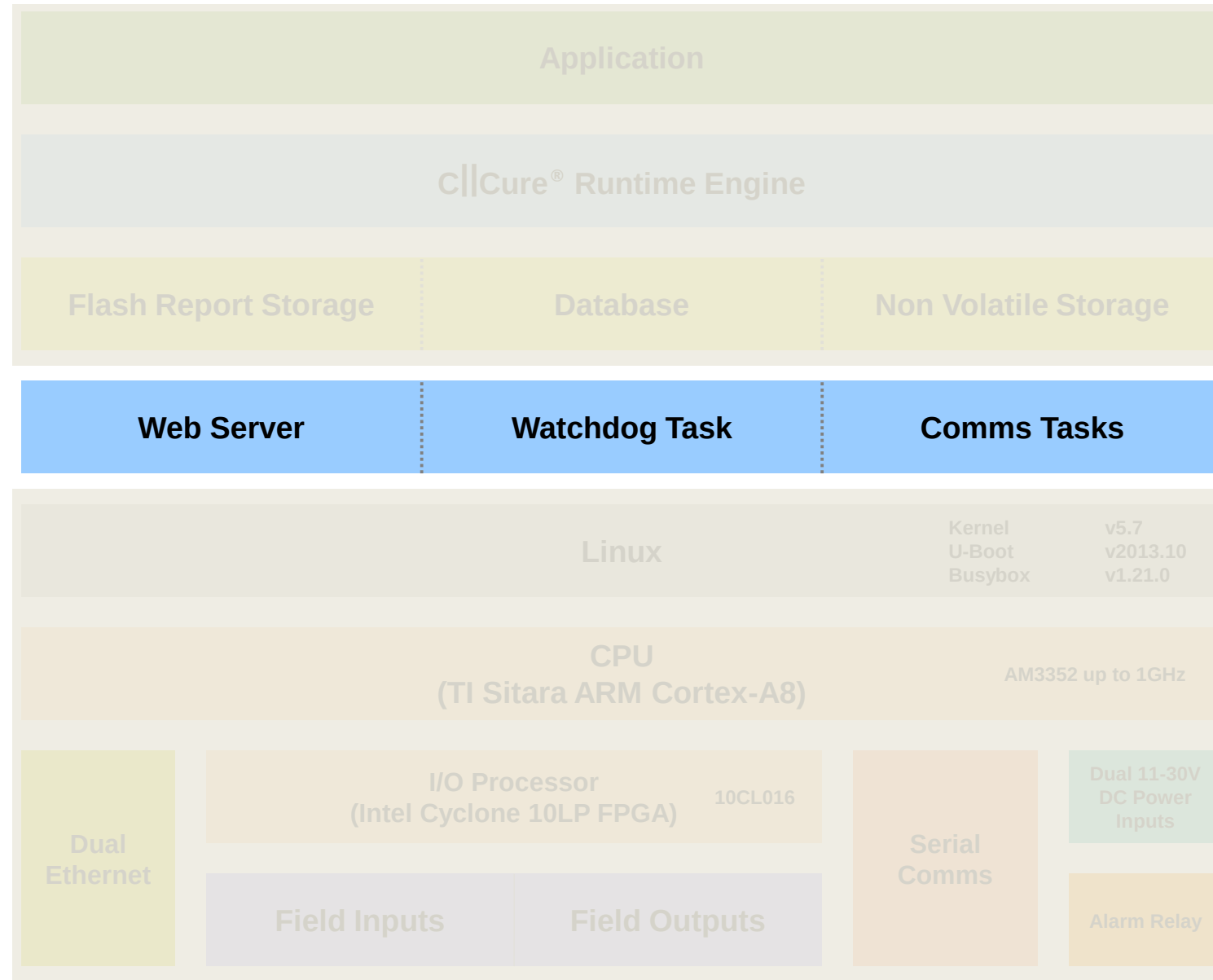
System Overview



Linux Kernel & Services

- Support for the hardware has been added to the main line of the Linux Kernel (as Nanobone)
- Only open-source support services such as U-Boot, Busybox and the Rijndael encryption packages
- Future proof as all source code available
- Highly reliable & secure with protected mode memory management
- Linux handles all the asynchronous events, such as communications
- High level network security using OpenSSL

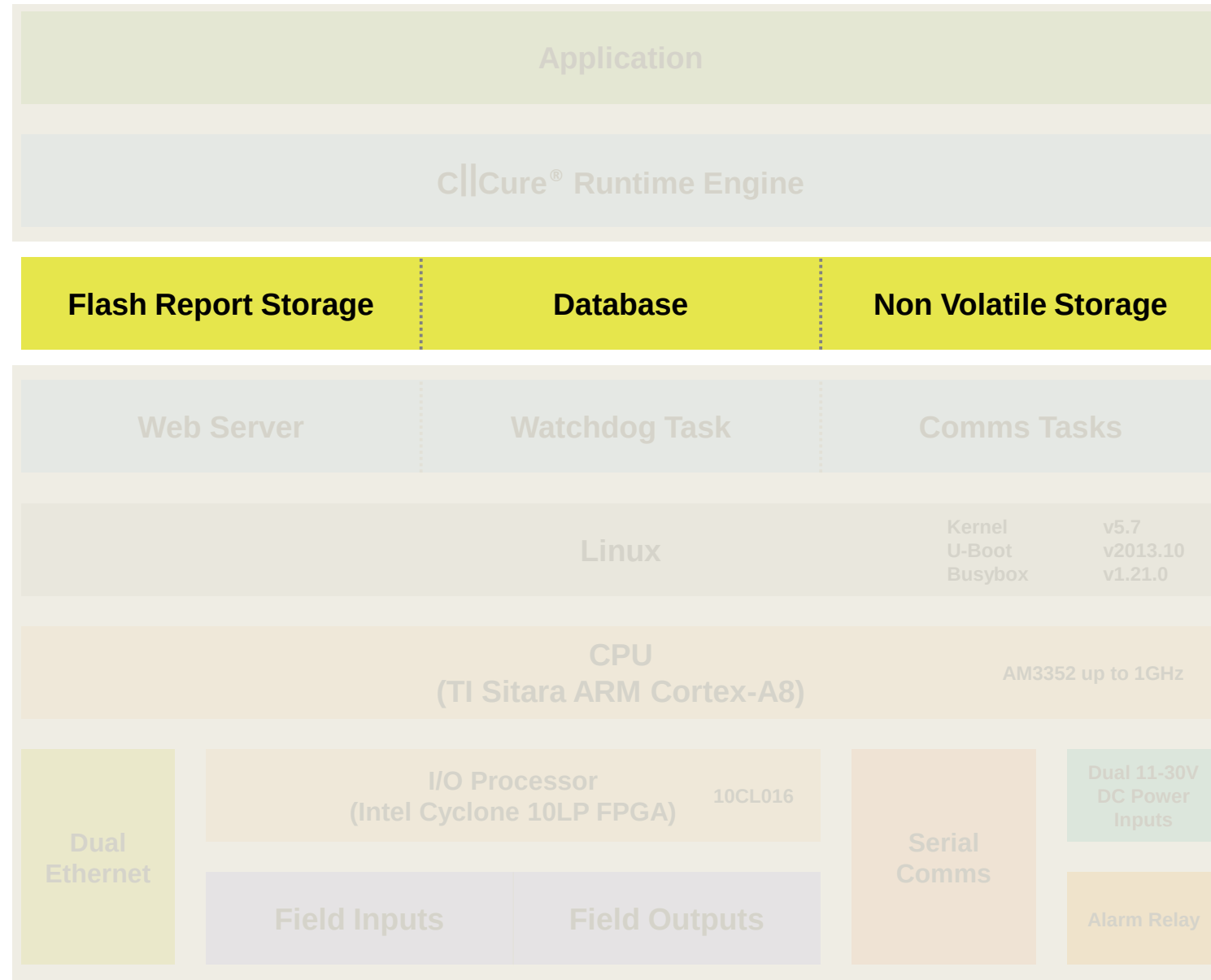
System Overview



Web, Watchdog & Comms

- The inbuilt Web server gives a rich user interface that can be accessed locally and remotely. Security options are selectable
- The watchdog manages the other tasks including the background hardware tests
- One of the strengths of the platform is communication options. Legacy Modbus support is very strong, but using XML, MQTT or OPC-UA allows completely future proof system design. The CPU power & Linux O/S create no limits for communications options

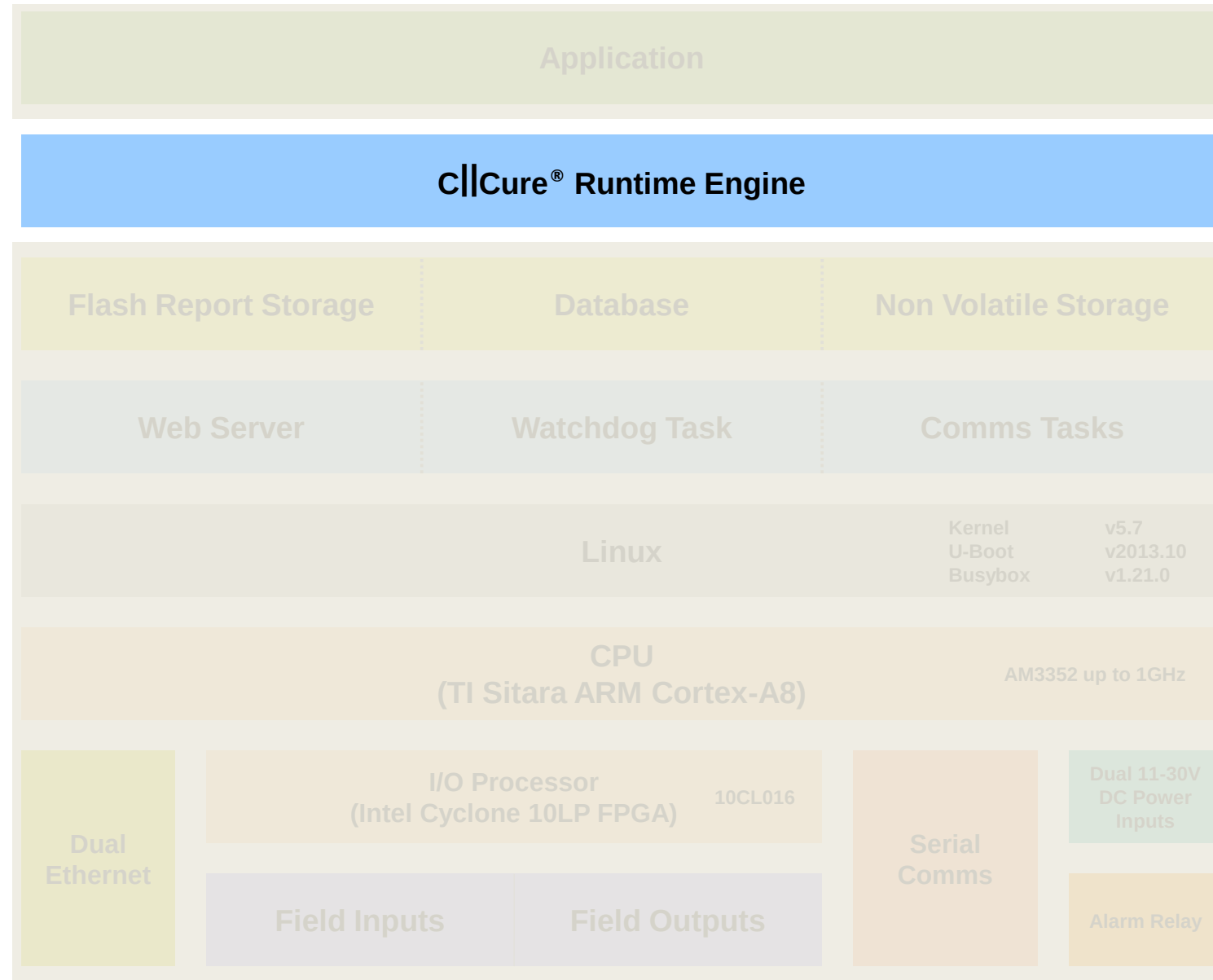
System Overview



Storage & Database

- The interface between the communications & Field I/O with the CllCure[®] run-time engine is via the database which is built at initial start up
- The flash storage utilises our own checksummed NOR flash linear file system for a predicable & reliable report storage
- The non-volatile storage utilises Ferroelectric RAM (FRAM) to replace SRAM and troublesome batteries. The FRAM is both checked and updated following each Heartbeat.

System Overview

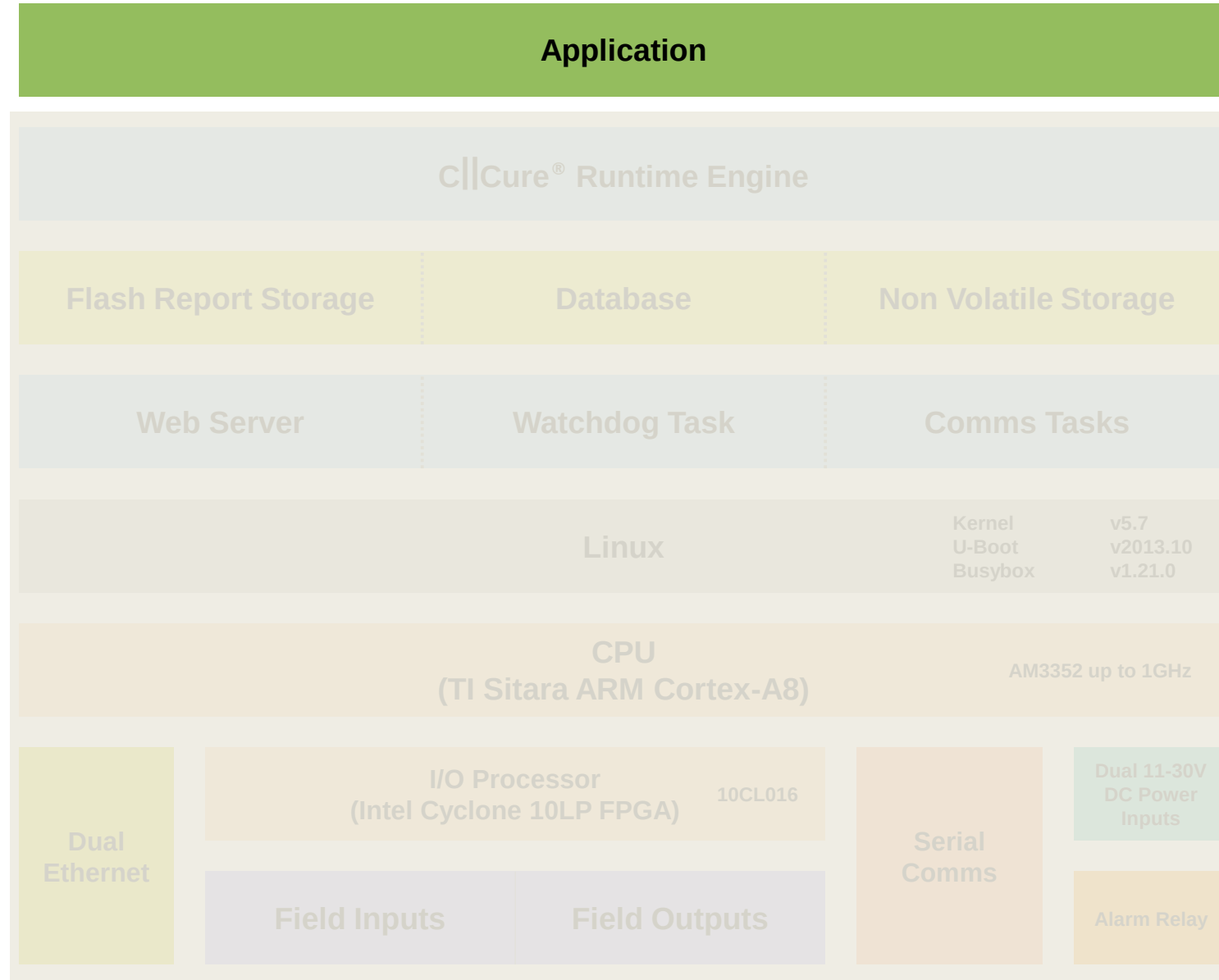


The ClCure[®] runtime engine has been designed to have these attributes:

- ◆ Predictable
- ◆ Repeatable
- ◆ Reliable

- The CllCure® engine runs as a single threaded task to completion on every Heartbeat
- The CllCure® language is a modification of C which is strongly typed, eliminates pointers and allows static memory allocation amongst other changes, to enhance security, hence a “secure” version of C
- It is easily learned and porting C to CllCure® or vice-versa is a relatively simple task
- Gives unrivalled diagnostics, locally & remotely

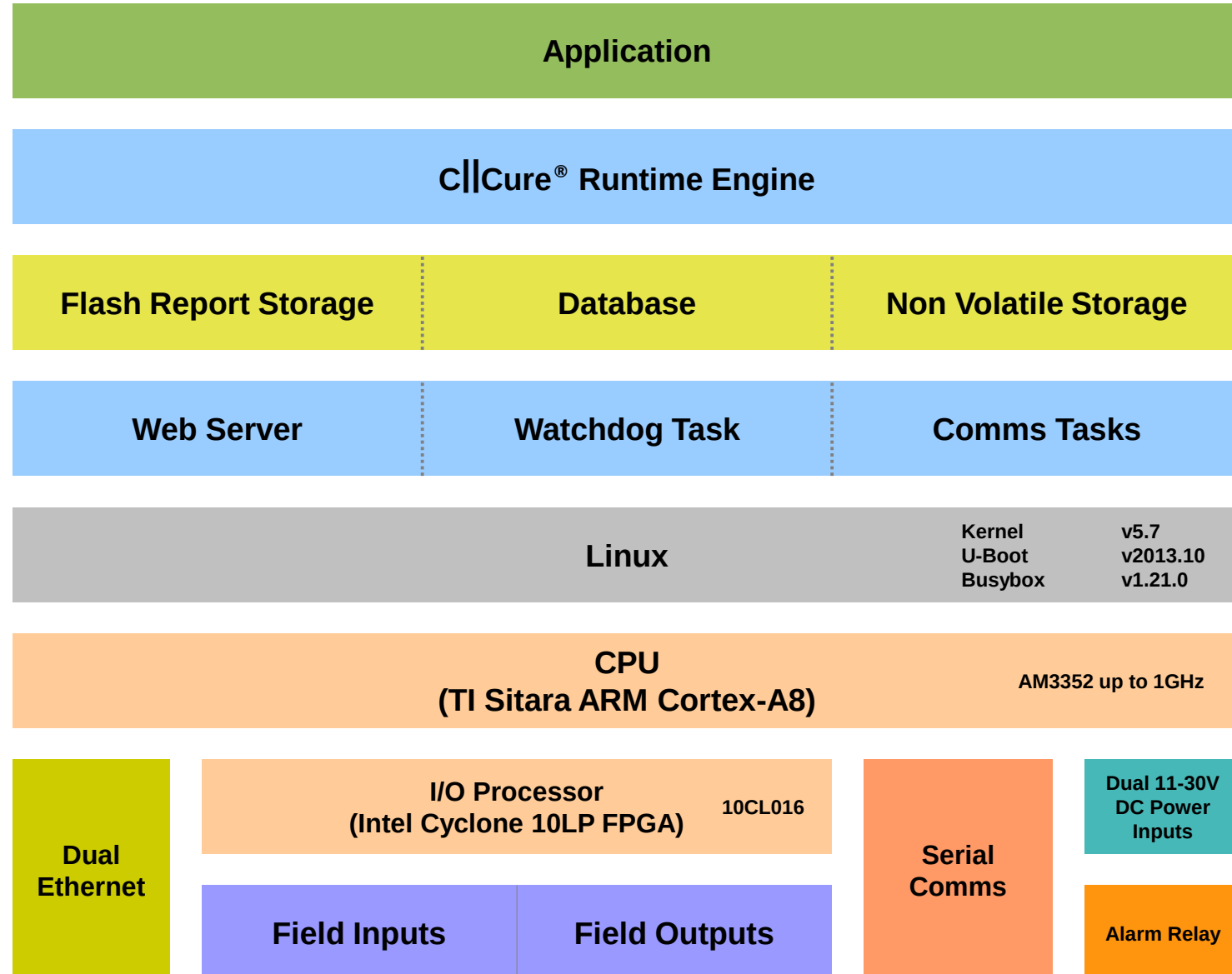
System Overview



Apps

- Apps, or applications, are generated using the Visual CllCure development environment
- Newflow have developed a suite of standard applications for Oil & LPG measurement, Gas Measurement, Master Meter Proving and Small Volume Proving. In addition we have created a large library of metering calculations for Oil, Gas and LPG
- Specific applications have been written to customer requirements and privately labelled.
- Apps can be maintained by others to guarantee end users cannot be held “hostage”
- The library manager assists management of changes

System Overview



More Information?



Visit the
Newflow
Website

newflow.co.uk

Trademarks

- CllCure is a registered trademark of Newflow Limited
- NANO is a trademark of Newflow Limited