

Practical Legato

A quick start guide to Legato development



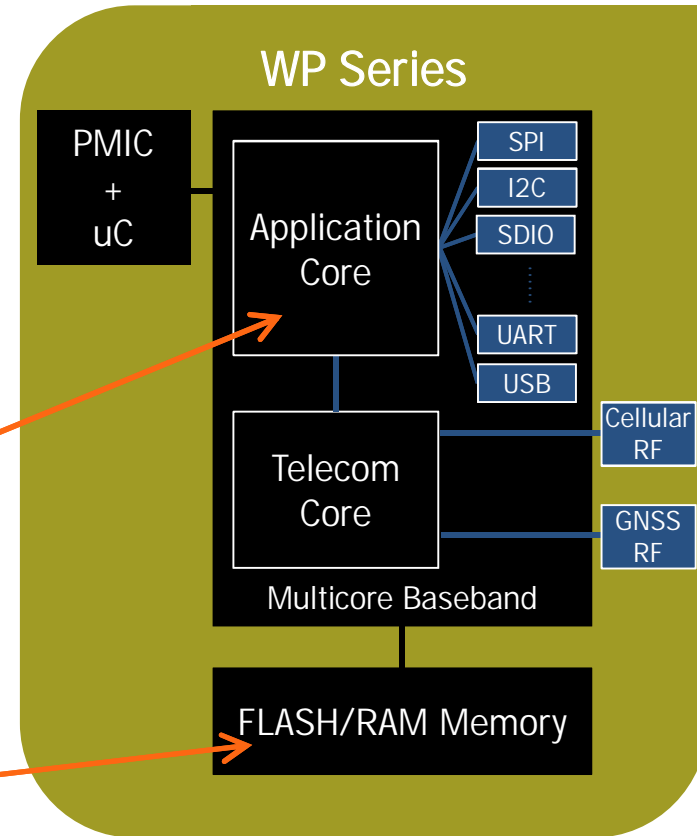
Getting started with Legato



AirPrime WP Series



3G / 4G
CORTEX-A5 @ 550 MHz 32 KBytes I-cache 32 KBytes D-cache 256 KBytes cache L2 ARMv7/Neon instructions Up to 863.5 MIPS
256 MBytes FLASH* 128 MBytes RAM*

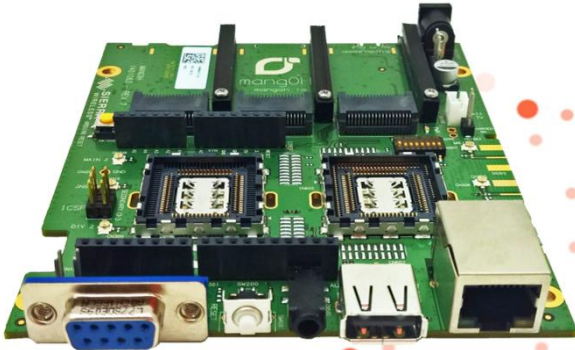


(*) Reserved for all embedded software running on the application processor including Linux kernel, root file system, framework and applications. Code is executed in RAM.



WP Ecosystem

mangOH Green



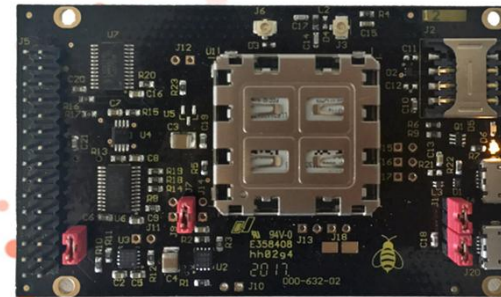
AirLink FX30 / FX30S



mangOH Red



Linkwave WasP



Downloads / Documentation

The Source

<https://source.sierrawireless.com>

- Documentation and downloads for WP Series and FX30.
- Hardware centric.

Legato

<http://legato.io>

- Site dedicated to Legato
- Includes all API documentation
- Tutorial
- Active forum

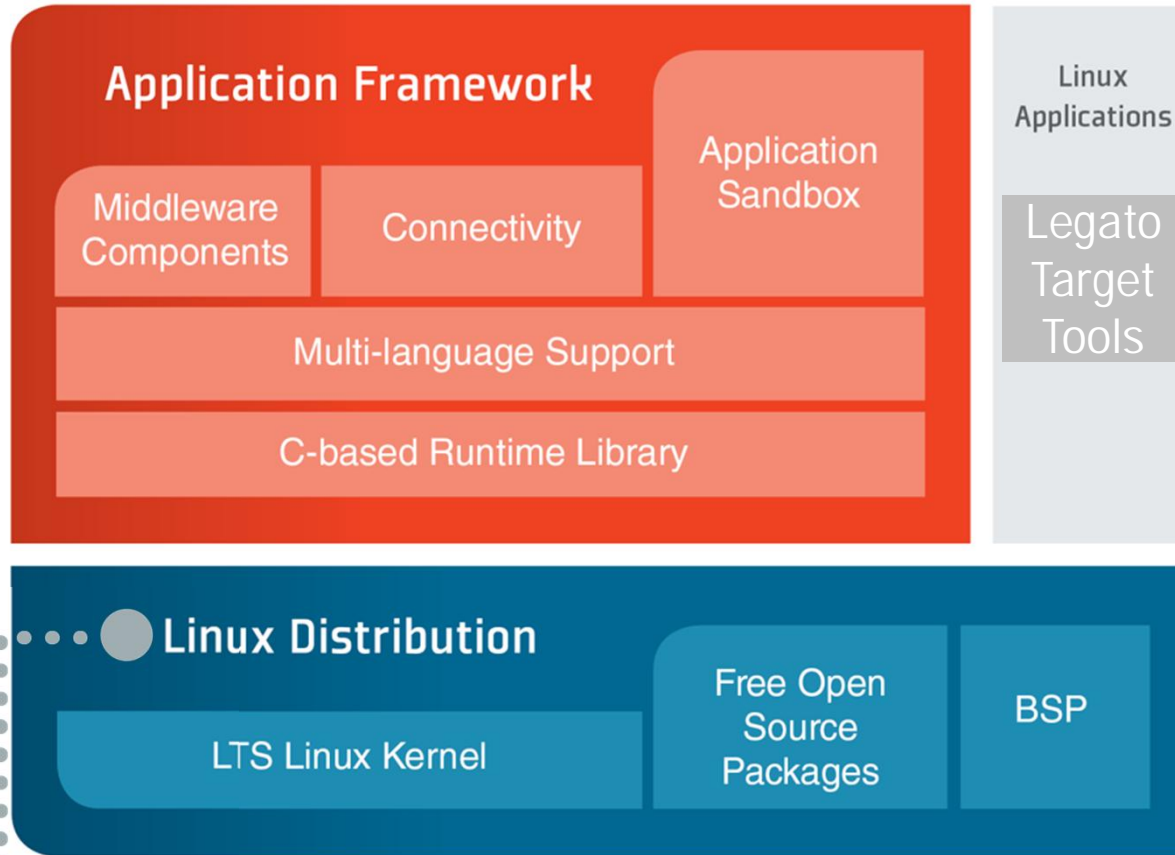
mangOH

<http://mangoh.io>

- Documentation and design files for mangOH Green and mangOH Red.
- IoT Expansion Card design data
- Active forum

Introduction to Legato

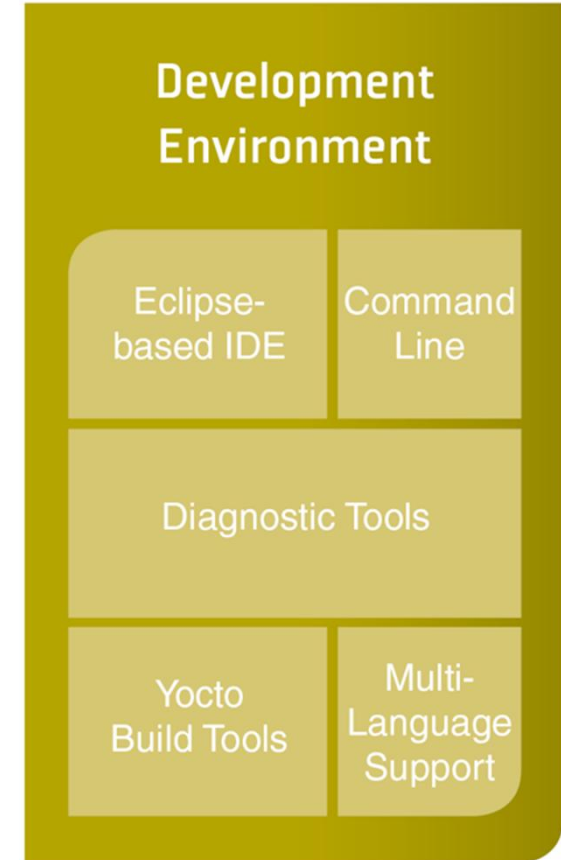
Target Based



Linux Applications

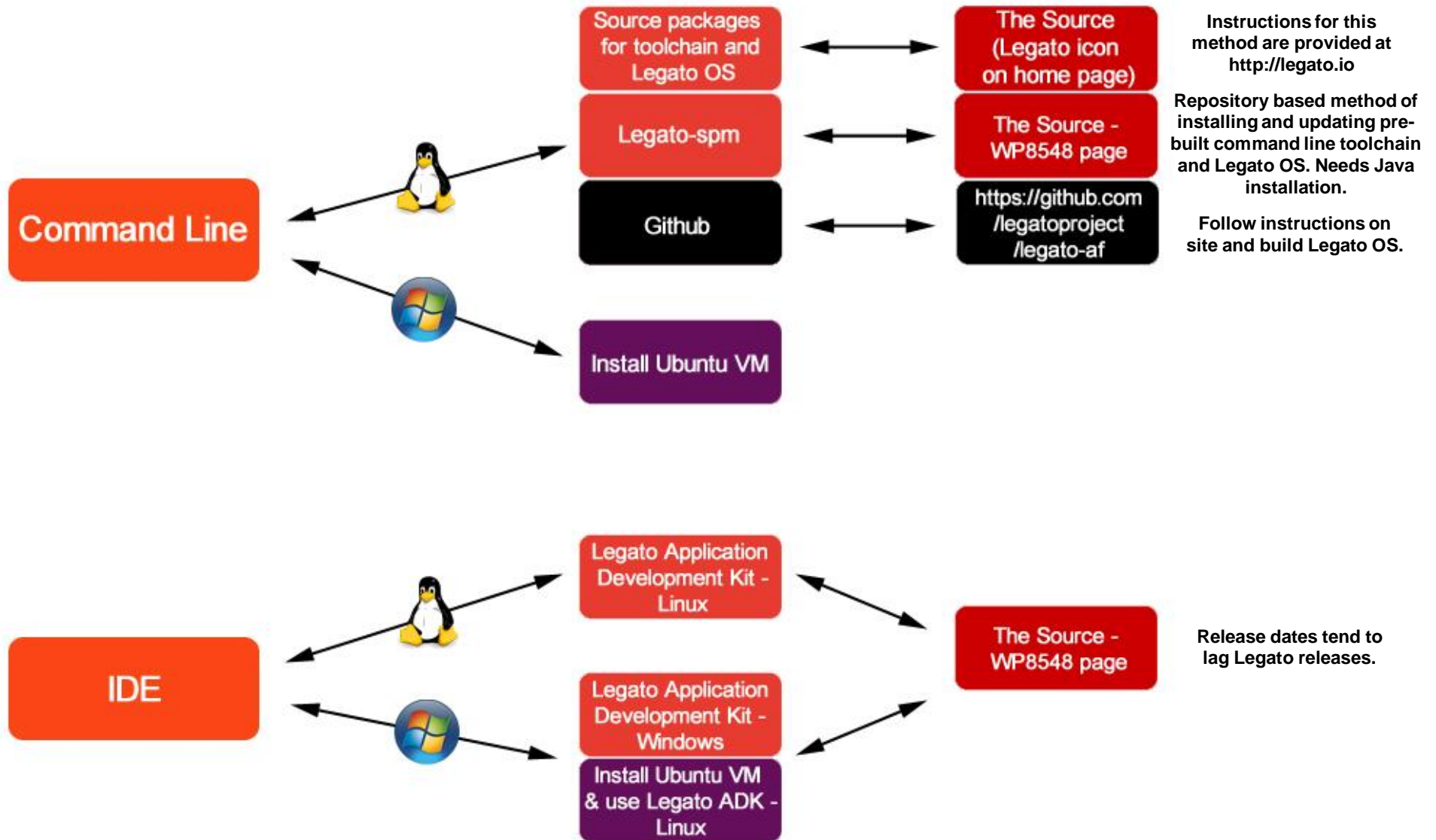
Legato Target Tools

Host Based



 Legato™

Legato Host Installation Methods



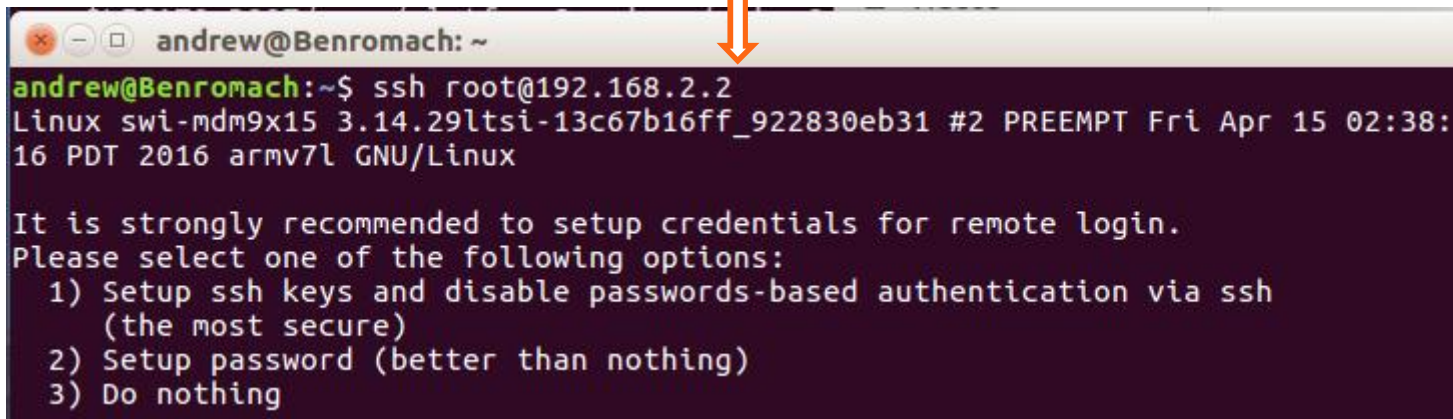
Development Host



Connect to Legato Target

USB0 port supports CDC-ECM with IP address 192.168.2.2 and will serve an IP address to host

ssh root@192.168.2.2



```
andrew@Benromach: ~  
andrew@Benromach:~$ ssh root@192.168.2.2  
Linux swi-mdm9x15 3.14.29ltsi-13c67b16ff_922830eb31 #2 PREEMPT Fri Apr 15 02:38:  
16 PDT 2016 armv7l GNU/Linux  
  
It is strongly recommended to setup credentials for remote login.  
Please select one of the following options:  
 1) Setup ssh keys and disable passwords-based authentication via ssh  
    (the most secure)  
 2) Setup password (better than nothing)  
 3) Do nothing
```

Since 16.10, only USB0 is accessible by default for ssh

Please note: the only other access is via serial console.

Legato – Target Based Command Line Tools

Standard Linux packages (BusyBox, curl etc.)

```
cm info
```

Get device details

```
cm radio status
```

Get modem status

```
cm sim status
```

Get SIM status

```
cm sms send <+44number> <"content">
```

```
cm data info
```

Check PDP context information

```
cm data apn <apn>
```

Set APN

```
cm data auth <none/pap/chap> <username> <password>
```

Set user / password

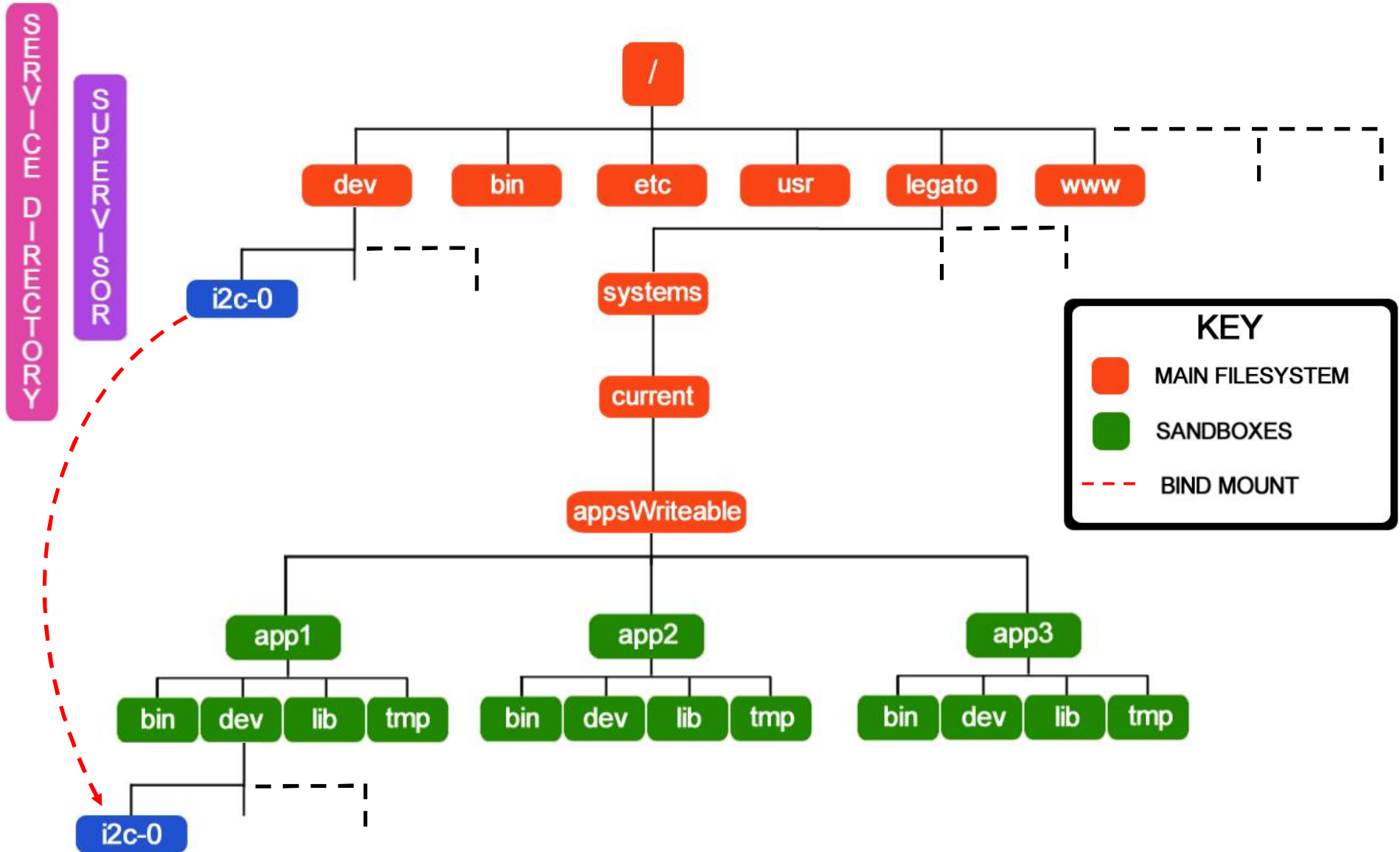
```
cm data connect
```

Activate PDP context

```
app [start|stop|restart|remove|status|version|info] APP_NAME [APP_NAME ...]
```

```
legato [start|stop|restart|version|help]
```

Legato Sandboxes



Minimal Legato App

A minimal Legato app is structured as follows:



Definition Files

COMPONENT DEFINITION .cdef	APPLICATION DEFINITION .adef
<ul style="list-style-type: none">• Which source files to include	<ul style="list-style-type: none">• Which executables to build from which components
<ul style="list-style-type: none">• Additional files required by component	<ul style="list-style-type: none">• Additional files to be included in build
<ul style="list-style-type: none">• Interfaces required or used by component	<ul style="list-style-type: none">• Manual / auto start of app
<ul style="list-style-type: none">• IPC interfaces implemented by component	<ul style="list-style-type: none">• Runtime resource limits – CPU memory
<ul style="list-style-type: none">• Other components needed by component	<ul style="list-style-type: none">• IPC bindings between components
<ul style="list-style-type: none">• + more	<ul style="list-style-type: none">• IPC interfaces made visible to other apps
	<ul style="list-style-type: none">• Watchdog parameters
	<ul style="list-style-type: none">• + more

RESOURCE REQUIREMENTS DEFINED AT BUILD TIME

Demonstration of Simple Legato App

1. `. bin/configlegatoenv` from Legato root
2. `mkapp -t wp85 helloworld_timer.adev`
3. `update helloworld_timer.wp85.update 192.168.2.2`
4. On host `app status 192.168.2.2`
OR
On target `app status`
5. On host `app start helloWorld_timer 192.168.2.2`
OR
On target `app start helloWorld_timer`
6. `logread -f /grep hello`