mruby

The programming language for IoT

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Ruby Association
mruby Forum
Embedded Software Development
Hardware
+
Software
Limited Resources

* Memory
* Processing power
* Time (Real-time processing)
Realtime?

*NOT* processing speed!

Time constraints in response from events.

i.e. “Deadline estimation”
Ruby for Embedded Software Development

mruby
Why Ruby?

- Easy to read, easy to implement
- ISO/IEC 30170, JIS X 3017
- Open source software
mruby provides:

• Lightweight C interface
  – C–func. and Ruby–method mapping

• Less resources in execution
  – mruby compiler and VM
  – Small VM < 250KB

• Realtime
  – Incremental GC
Compiler and VM

mruby code

Code analyze

Bytecode

Execution in target device

Compiler

Device independent format

VM
Ruby and mruby

- Ruby
  - Widely used in Web application development
  - Rapid software development
- mruby
  - Reduce resources in execution
  - Compiler and VM, like Java environment
Software development using mruby

* Build VM for target device
* Implement mruby application
* Test
* Deploy
Test in early phase

* VM for PC
  Test application on PC with emulated driver
Using C

1. Implement C application
2. Download to target device
3. Test on target device
   If errors, back to 1
Using mruby

0. Build VM for PC and for target device

1. Implement mruby application

2. Test on PC (with VM for PC)
   If errors, back to 1

3. Download to target device

4. Test on target device (with VM for device)
   If errors, back to 1
More advantages

* Develop mruby application without target device
* Separate hardware layer code and abstracted layer code
* Hide source code
Get mruby

Latest

https://github.com/mruby/mruby

Versioned mruby (with Tested libraries)

http://forum.mruby.org/
DEMO
Sample Program

a = 15
p a * 2

a = 1.2
p a * 2

a = "abc"
p a * 2

a = [1, 2]
p a * 2
def func(n)
    return n+1
end

if rand(2)==1 then
    def func(n)
        return n*2
    end
end

p func(5)
Research Topic
mruby

```ruby
i = 100
while i < 110 do
  puts i
  i = i + 1
end

i = 209
while i >= 200 do
  puts i
  i = i - 1
end
```