I want to connect weird stuff to the internet.

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Only Person at Rascal Micro

Sketching in Hardware
July 31, 2011

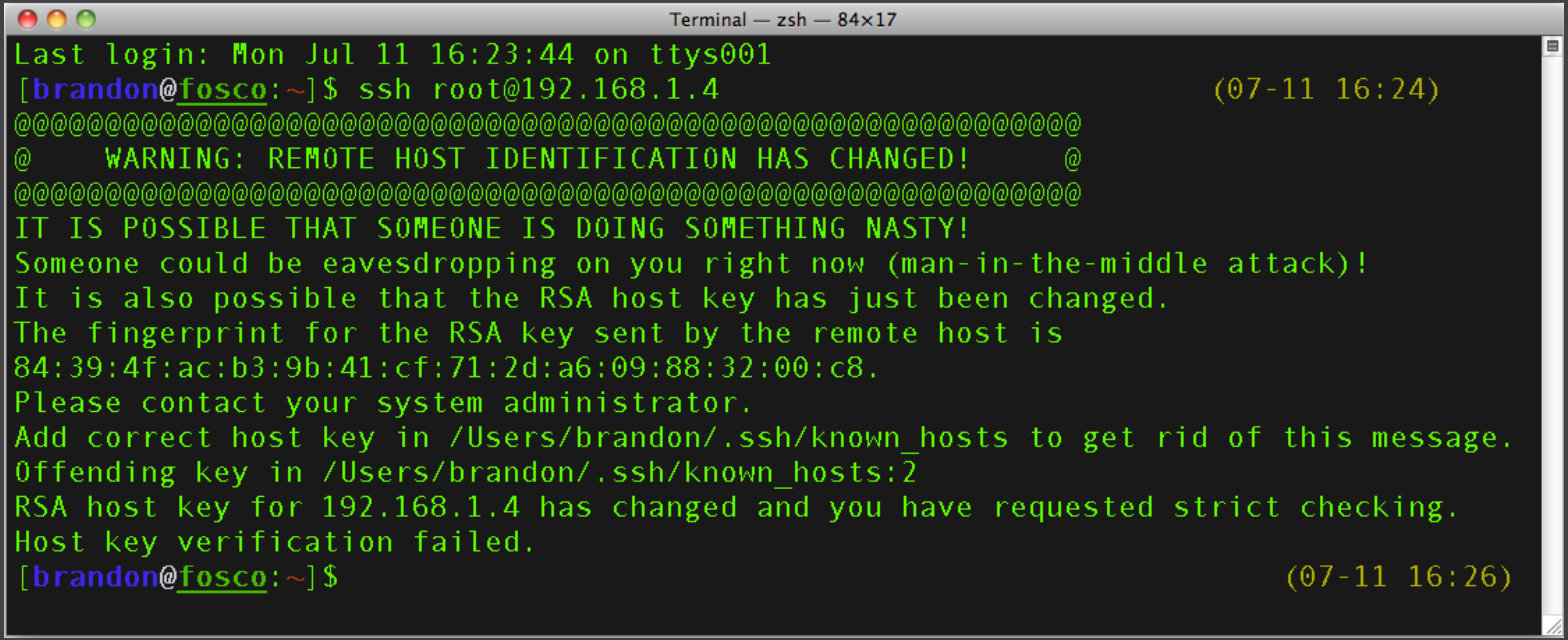
rascal micro

I can’t find the damn thing’s IP address

Zero configuration networking

AKA “Bonjour”

SSH is baffling.



```
Last login: Mon Jul 11 16:23:44 on ttys001
[brandon@fosco:~]$ ssh root@192.168.1.4                             (07-11 16:24)
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@    WARNING: REMOTE HOST IDENTIFICATION HAS CHANGED!     @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
IT IS POSSIBLE THAT SOMEONE IS DOING SOMETHING NASTY!
Someone could be eavesdropping on you right now (man-in-the-middle attack)!
It is also possible that the RSA host key has just been changed.
The fingerprint for the RSA key sent by the remote host is
84:39:4f:ac:b3:9b:41:cf:71:2d:a6:09:88:32:00:c8.
Please contact your system administrator.
Add correct host key in /Users/brandon/.ssh/known_hosts to get rid of this message.
Offending key in /Users/brandon/.ssh/known_hosts:2
RSA host key for 192.168.1.4 has changed and you have requested strict checking.
Host key verification failed.
[brandon@fosco:~]$                                                      (07-11 16:26)
```

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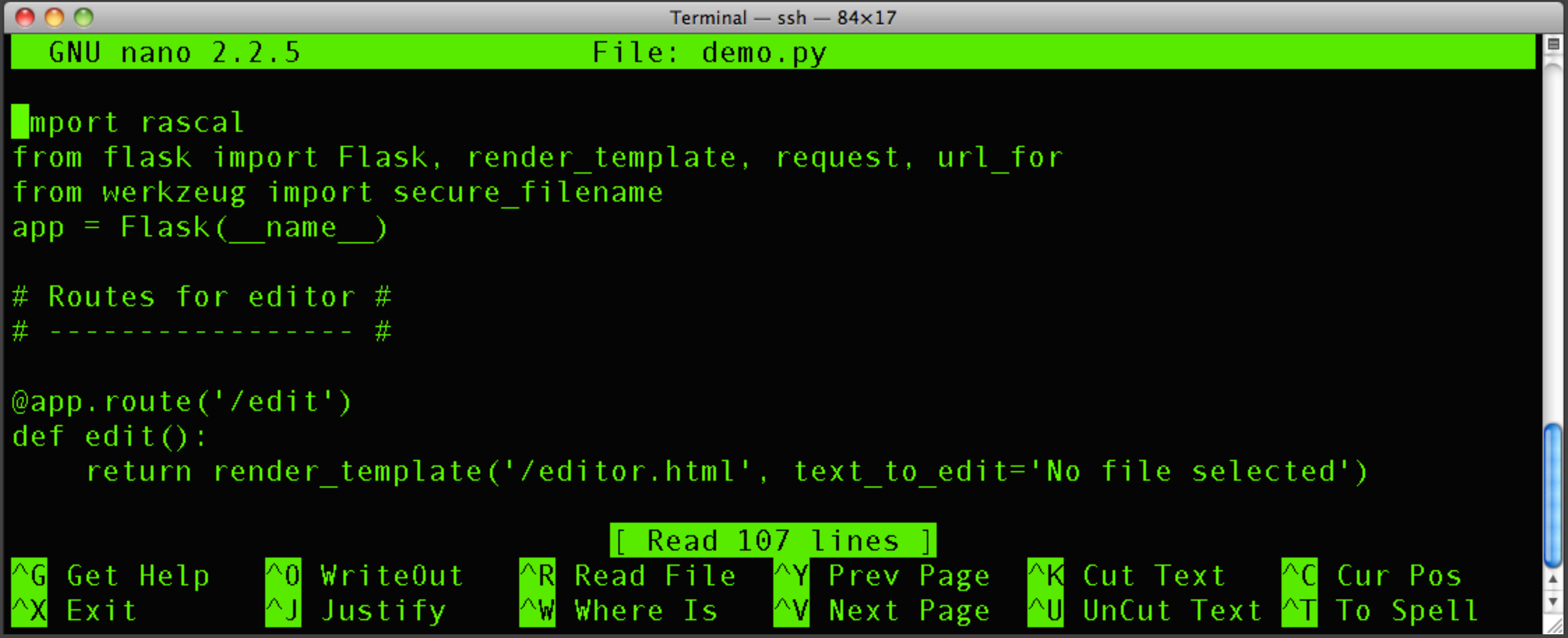
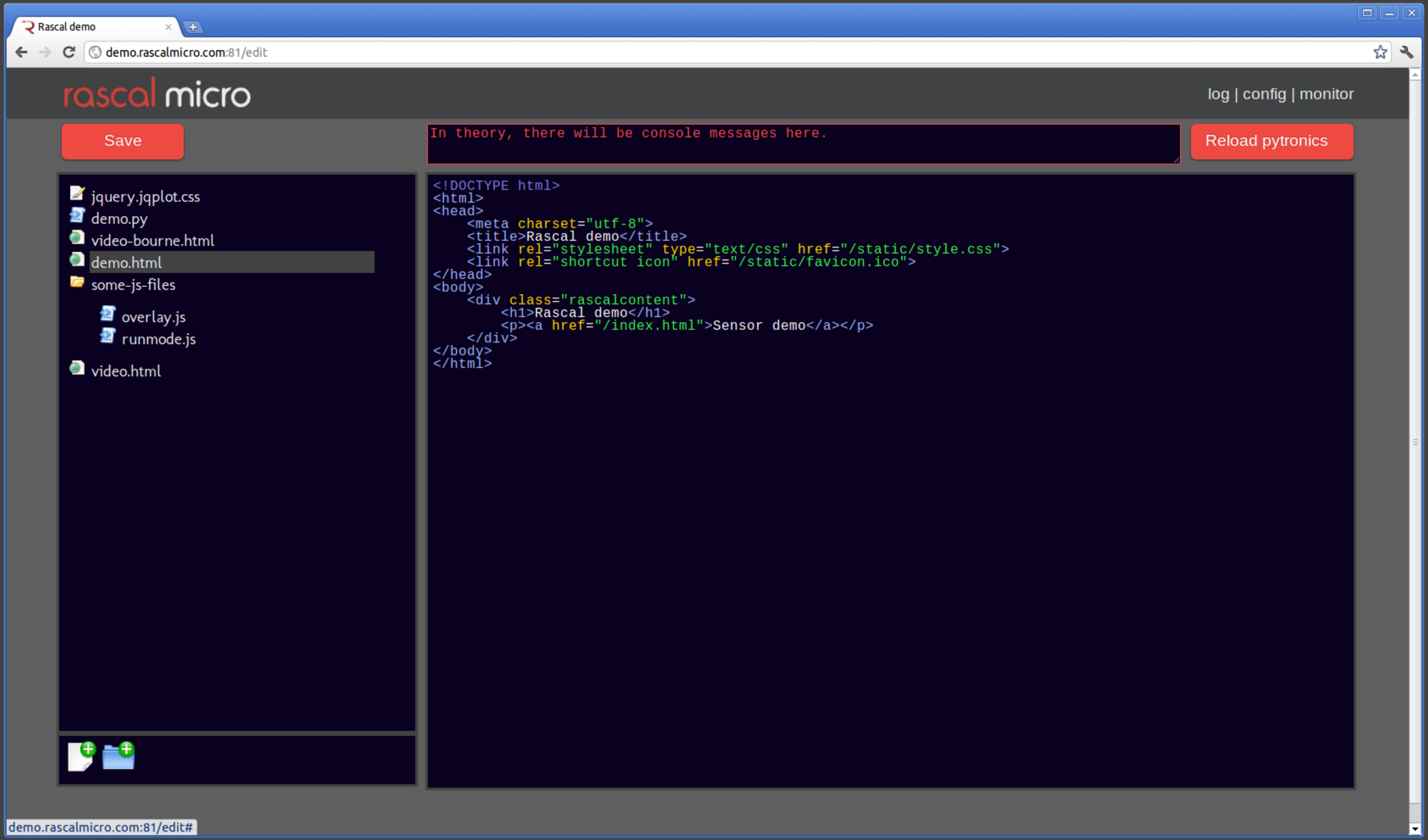
Console text editors are ugly.



```
  GNU nano 2.2.5                 File: demo.py

import rascal
from flask import Flask, render_template, request, url_for
from werkzeug import secure_filename
app = Flask(__name__)

# Routes for editor #
# ---------------- #

@app.route('/edit')
def edit():
    return render_template('/editor.html', text_to_edit='No file selected')

                                  [ Read 107 lines ]
^G Get Help   ^O WriteOut   ^R Read File  ^Y Prev Page  ^K Cut Text   ^C Cur Pos
^X Exit       ^J Justify    ^W Where Is   ^V Next Page  ^U UnCut Text ^T To Spell
```

Self-serve programming tools

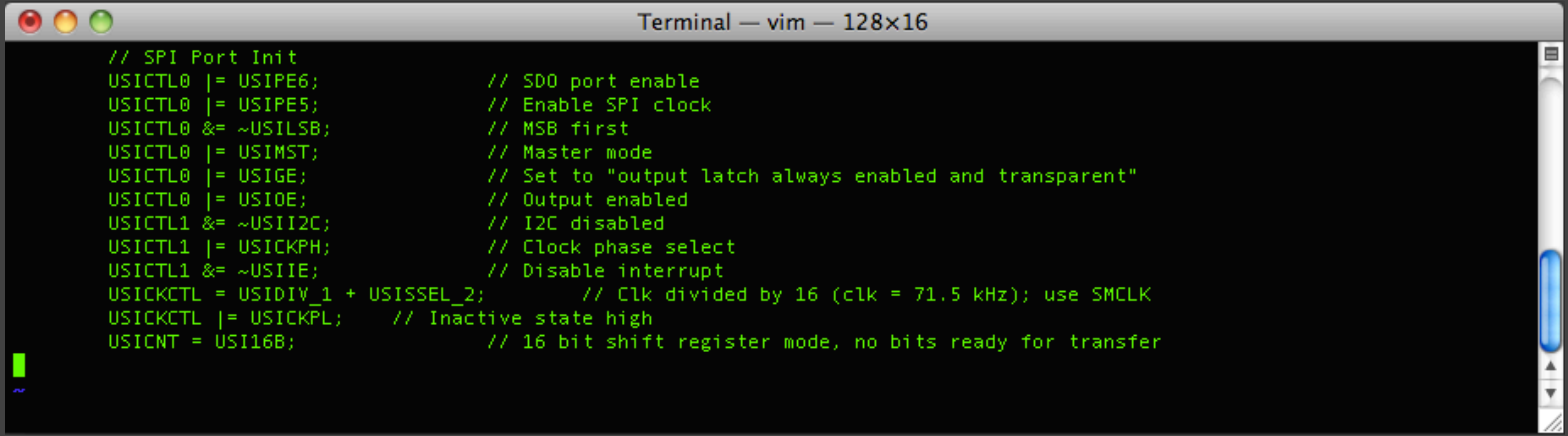


```
In theory, there will be console messages here.
```

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="utf-8">
    <title>Rascal demo</title>
    <link rel="stylesheet" type="text/css" href="/static/style.css">
    <link rel="shortcut icon" href="/static/favicon.ico">
</head>
<body>
    <div class="rascalcontent">
        <h1>Rascal demo</h1>
        <p><a href="/index.html">Sensor demo</a></p>
    </div>
</body>
</html>
```

rascal micro

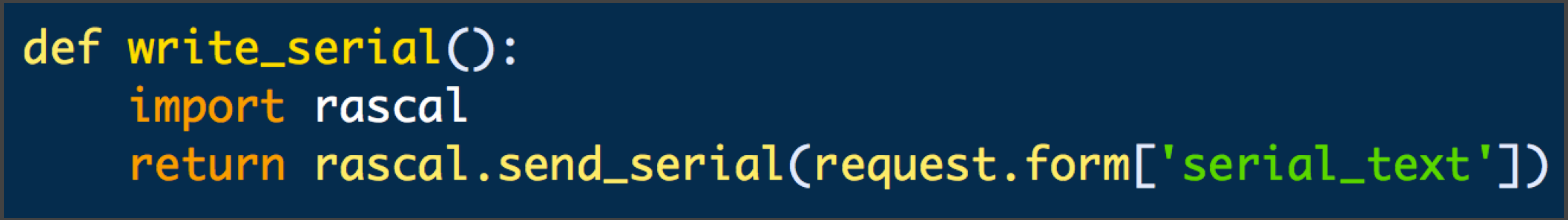
Embedded C, Makefiles, and gcc are scary.



```
        // SPI Port Init
        USICTL0 |= USIPE6;              // SDO port enable
        USICTL0 |= USIPE5;              // Enable SPI clock
        USICTL0 &= ~USILSB;             // MSB first
        USICTL0 |= USIMST;              // Master mode
        USICTL0 |= USIGE;               // Set to "output latch always enabled and transparent"
        USICTL0 |= USIOE;               // Output enabled
        USICTL1 &= ~USII2C;             // I2C disabled
        USICTL1 |= USICKPH;             // Clock phase select
        USICTL1 &= ~USIIE;              // Disable interrupt
        USICKCTL = USIDIV_1 + USISSEL_2;        // Clk divided by 16 (clk = 71.5 kHz); use SMCLK
        USICKCTL |= USICKPL;    // Inactive state high
        USICNT = USI16B;                // 16 bit shift register mode, no bits ready for transfer

~
```

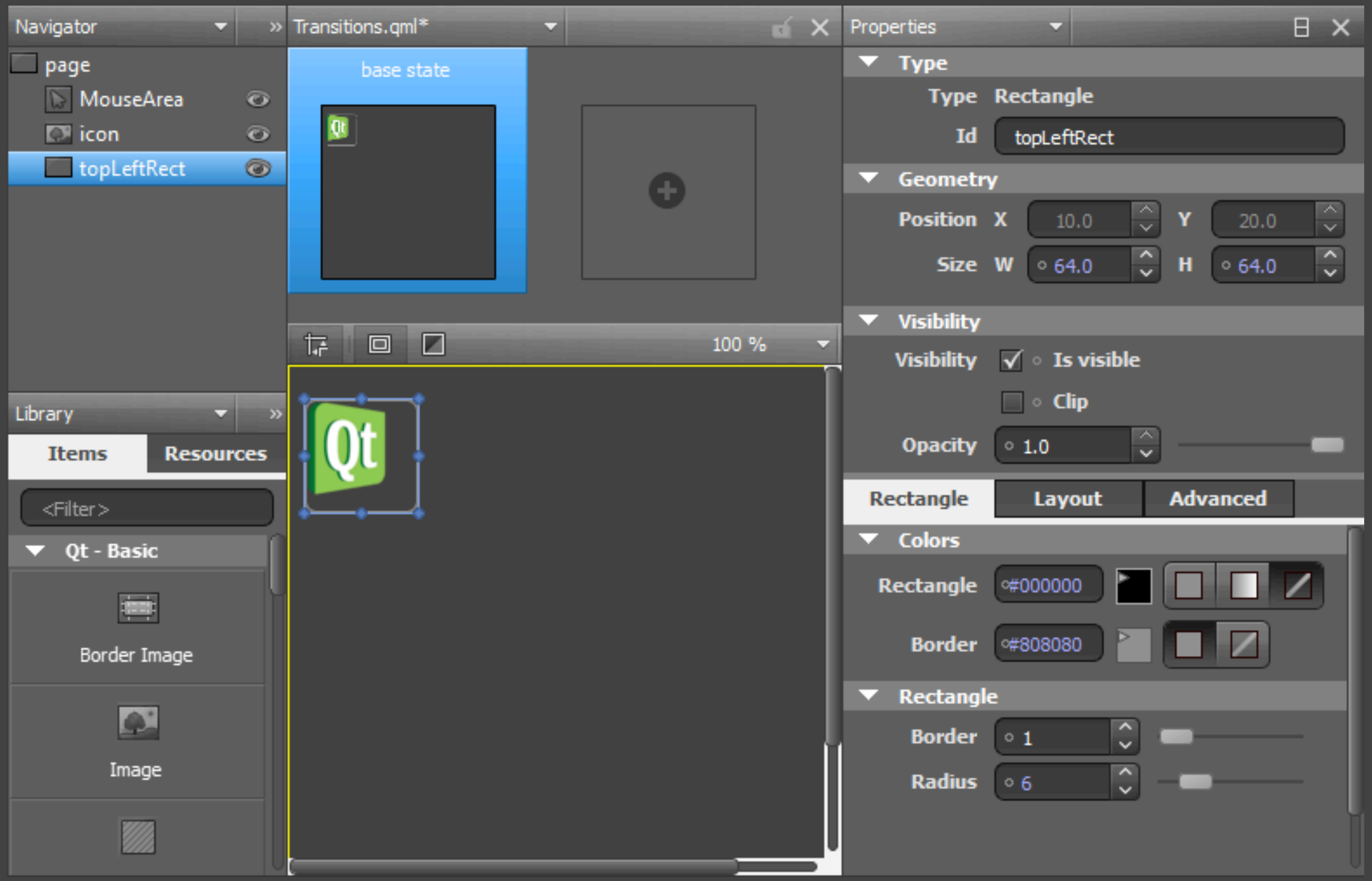
Python is friendly.

So is Ruby.



```python
def write_serial():
    import rascal
    return rascal.send_serial(request.form['serial_text'])
```

GUI builders for Qt or GTK



Type

Type Rectangle

Id topLeftRect

Geometry

Position X 10.0 Y 20.0

Size W 64.0 H 64.0

Visibility

Visibility ☑ Is visible

□ Clip

Opacity 1.0

Colors

Rectangle #000000

Border #808080

Rectangle

Border 1

Radius 6

Qt Quick IDE

HTML and CSS have won

“[HTML] is *the* format of our age.”
-- Mark Pilgrim

Quote from http://mark.pilgrim.usesthis.com

rascal micro

No users, permissions, sessions

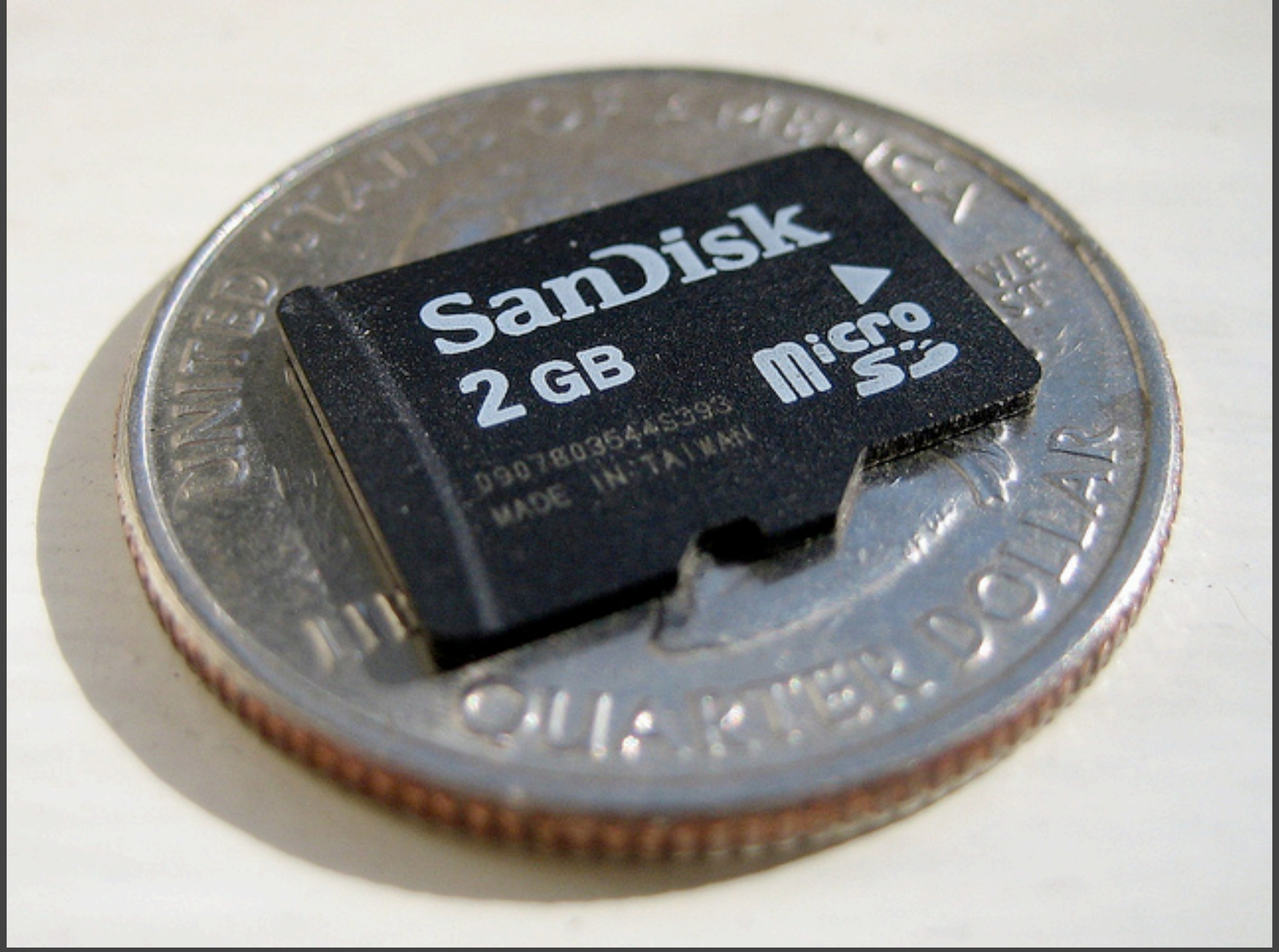
Nailed by web frameworks

Ruby on Rails
Django (sort of "Python on Rails")
My personal favorite: Flask

Low fault tolerance

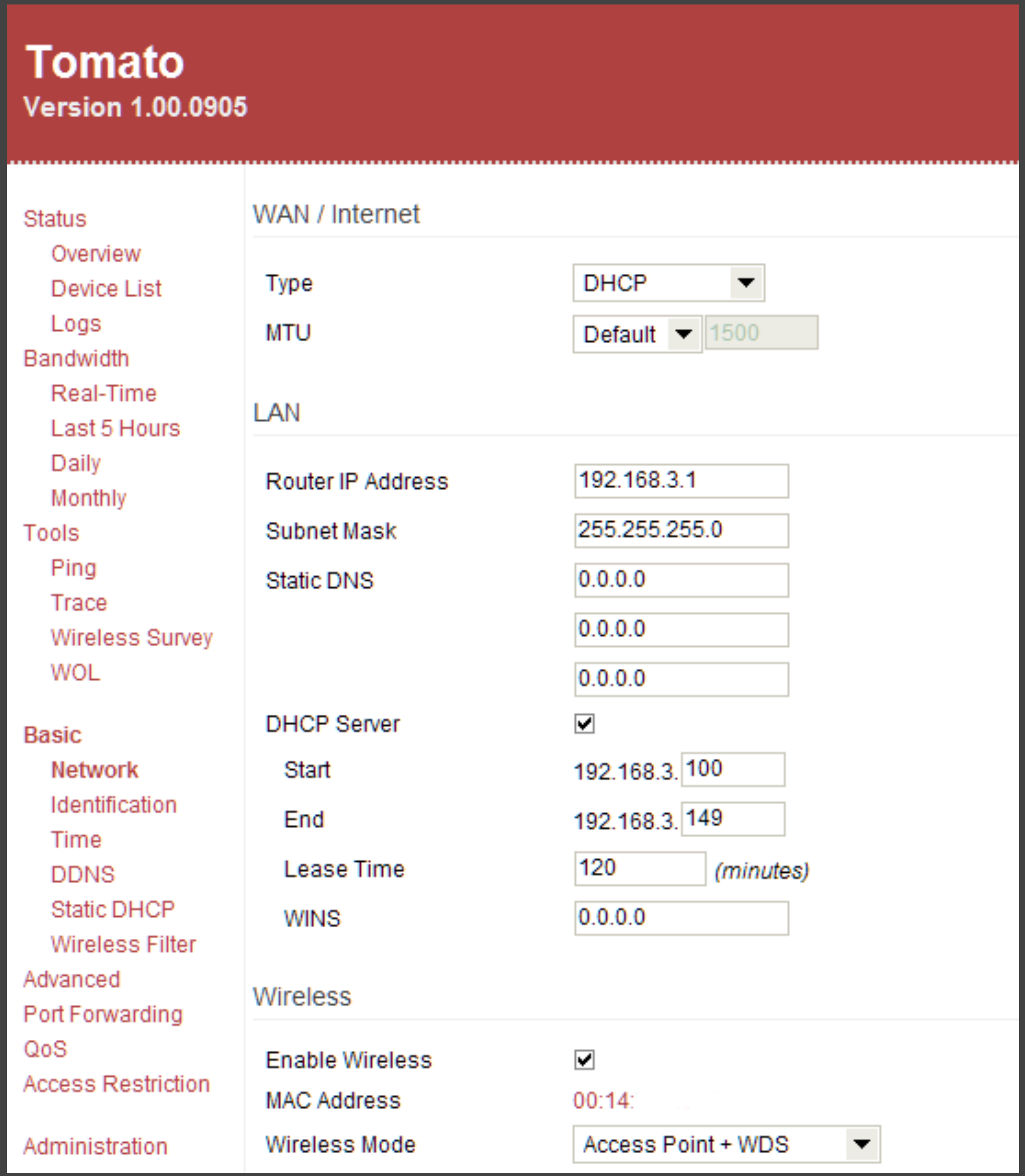
“I edited some files, and now it won’t boot.”

Preconfigured SD cards



Dynamic IP addresses

Routers with free firmware



Tomato
Version 1.00.0905

WAN / Internet

Type	DHCP
MTU	Default 1500

LAN

Router IP Address	192.168.3.1
Subnet Mask	255.255.255.0
Static DNS	0.0.0.0 0.0.0.0 0.0.0.0
DHCP Server	☑
Start	192.168.3.100
End	192.168.3.149
Lease Time	120 *(minutes)*
WINS	0.0.0.0

Wireless

Enable Wireless	☑
MAC Address	00:14:
Wireless Mode	Access Point + WDS

Tomato or DD-WRT with dynamic DNS