

Contiki Operating System

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March 4, 2020

Contiki

1. OS for memory-constrained systems
2. Focus on low-power wireless Internet of Things devices
3. Built in TCP/IP stack and light-weight preemptive scheduling
4. Provides multitasking
5. New branch is Contiki-NG(OS for next generation IoT devices)

Contiki

Networking

- Provides 3 network mechanisms : **uIP**, **uIPv6**, **Rime Stack**.
- Rime is an **alternative network stack**.
- Default primitives are **single-hop unicast**, **single-hop broadcast**, **multi hop unicast**, **network flooding** & **address free data collection**.

Low-power operation

- Severely **power constrained**.
- Provides a set of mechanisms to **reduce power consumption** of systems on which it runs.
- Low power operation of radio is called **ContikiMAC**.

Simulation

- Consists a network simulator called **Cooja**.
- It simulates networks of **contiki nodes**.
- Node belongs to 3 types:
 1. **Emulated nodes**
 2. **Cooja nodes**
 3. **Java nodes**.

Installation of Contiki

Setting up Instant Contiki with Virtualbox

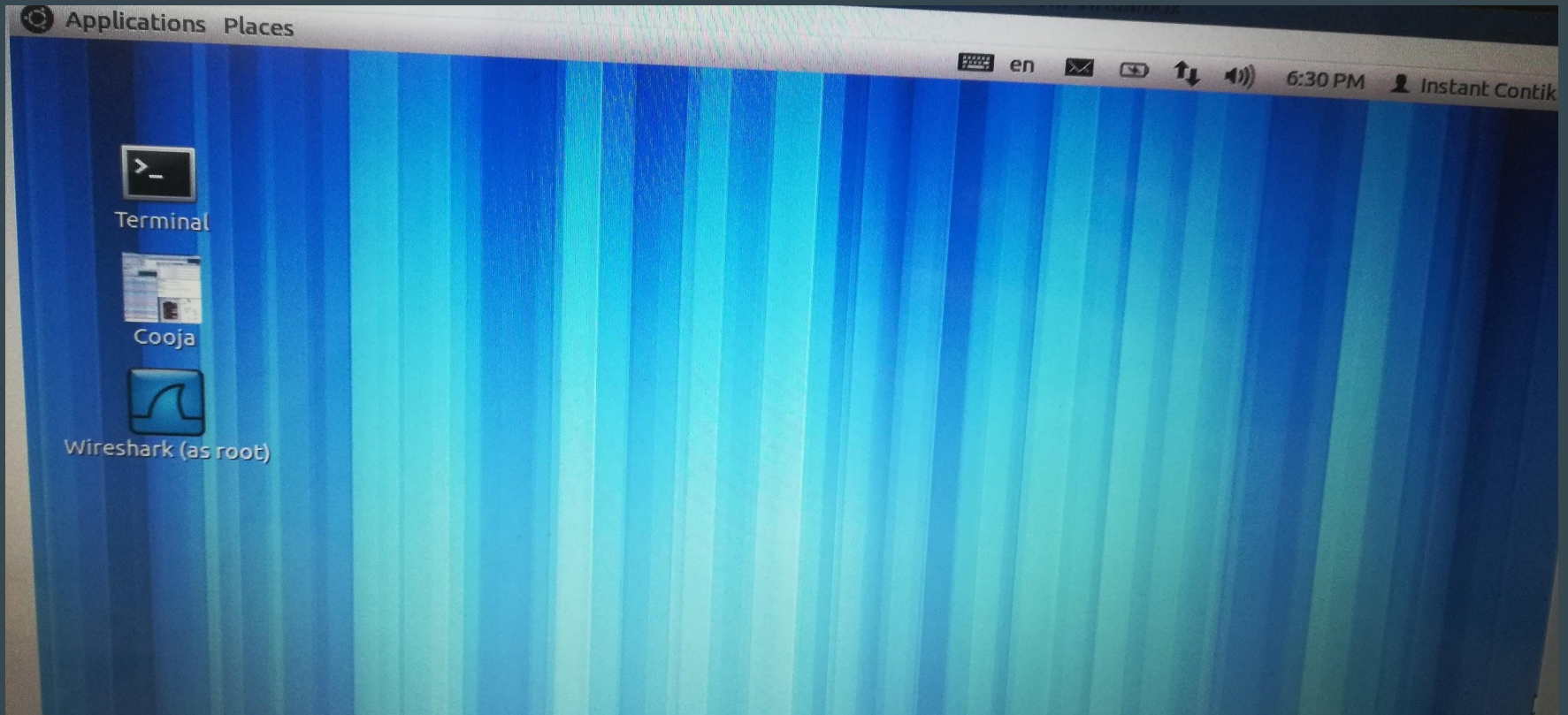


VM Virtualbox Manager

Sensor Motes

1. Motes are small, portable sensors that can detect temperature, humidity and light levels anywhere.
2. They can be placed almost anywhere. They last about a year on a single battery and don't require an internet connection to work.
3. Motes will alert your smartphone or tablet when certain conditions are met. You can even graph historical data via an available cloud service.
4. Sensor motes: TinyOS, Contiki, MANTIS, YATOS
5. Motes supported by Contiki OS:
 - Mica Z
 - Wismote mote
 - Z1 mote
 - Sky motes
 - ESB Mote

Instant Contiki Main Screen after Login

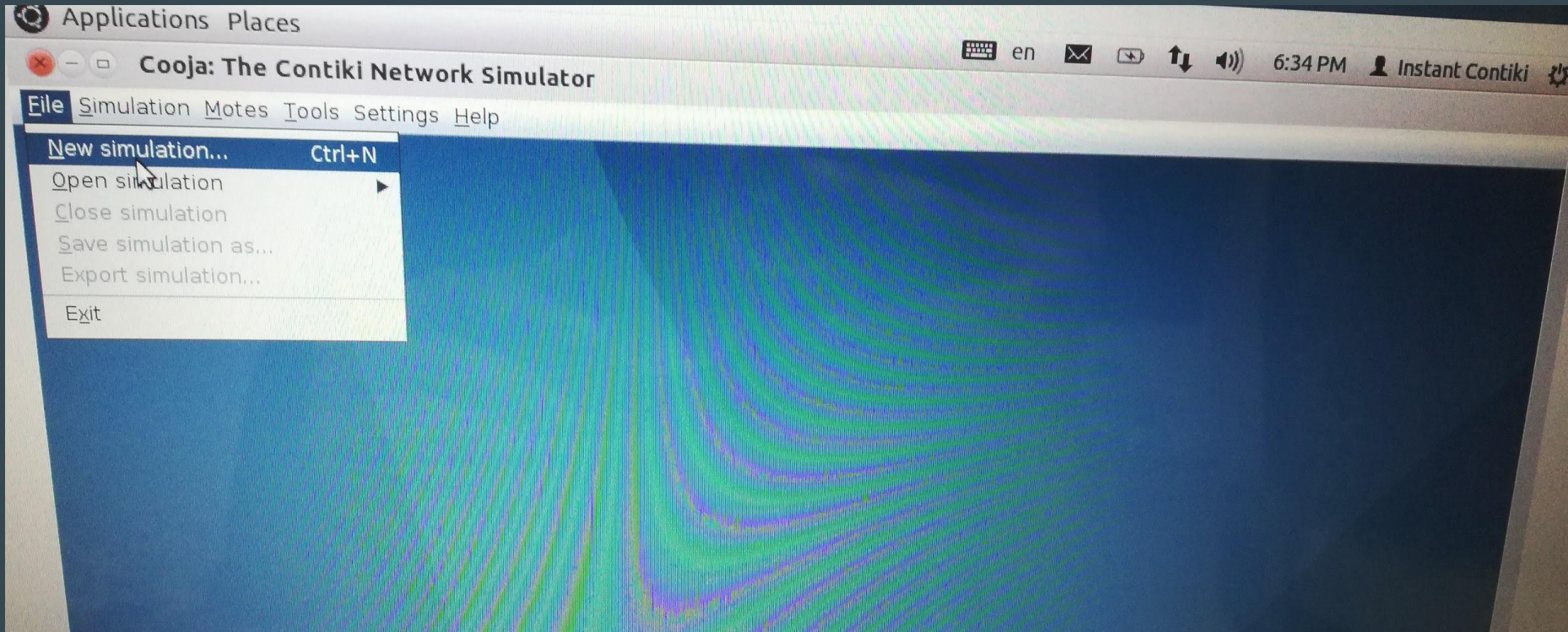


Commands to start Cooja

File Edit View Search Terminal Help

```
user@instant-contiki:~$  
Display all 2593 possibilities? (y or n)  
user@instant-contiki:~$  
user@instant-contiki:~$ cd contiki  
user@instant-contiki:~/contiki$ ls  
apps  doc  Makefile.include  README-EXAMPLES.md  tools  
core  examples  platform  README.md  
cpu  LICENSE  README-BUILDING.md  regression-tests  
user@instant-contiki:~/contiki$ cd apps  
user@instant-contiki:~/contiki/apps$ ls  
about  directory  httpd-ws  program-handler  telnet  
antelope  email  http-post-auth  rest-coap  telnetd  
calc  erbium  irc  rest-common  unit-test  
cmd  er-coap-03  json  rest-http  vnc  
codeprop  er-coap-07  netconf  serial-shell  webbrowser  
collect-view  er-coap-12  ping6  servreg-hack  webserver  
deluge  er-coap-13  powertrace  shell  webserver-nano  
dhc  ftp  process-list  slip-cmd  
user@instant-contiki:~/contiki/apps$ cd ..  
user@instant-contiki:~/contiki$ cd..  
cd..: command not found
```

Creating new simulation for Cooja



Cooja Simulator

