

Building ***NETWORK EQUIPMENT***

and a ***BUSINESS*** with

***FREE SOFTWARE &***

***LIBERATED HARDWARE***



**LIBRE  
PLANET  
2019**

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We live in a  
*CONNECTED* world!



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*HANDHELD COMPUTING* **Devices**

**Voice Operated** VIRTUAL ASSISTANTS

HOME AUTOMATION **Systems**

**Audio/Video MEDIA PLAYERS**

**INTERNET OF THINGS Devices**

**These devices need**

***NETWORK***

*NETWORK* needs  
equipment to function

*ROUTERS*

*WIRELESS* **Access Points**

*NETWORK SECURITY* **Appliances**



**Network *ACCESS CONTROLLERS***

**Network Attached *STORAGE***

***VoIP* Phones**

We live in a  
*CONNECTED* world!  
Surrounded by  
*BLACKBOXES.*



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**Surrounded and  
probably surveilled by  
*BLACKBOXES***

What is a *BLACKBOX*?

**Essentially a *COMPUTER***

***LOCKED-DOWN* Hardware**

***NON-FREE* Software**

**Vendor controlled**

***USABILITY***

***UPGRADE***

***SUPPORT***

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**Crippled user rights to**

***REPAIR***

***EXTEND***

***RE-PURPOSE***

**Most of the proprietary  
equipment run either *BSD*  
or *LINUX* or *GNU* and  
other *FREE SOFTWARE***

**A lot of them violate**

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Type Of License	Application
GNU GENERAL PUBLIC LICENSE VERSION 2 (GPL v2)	arptables, busybox, bwm-ng, caswell-lanbypass, contrack-tools, compat-wireless, ebtables, ethtool, e2fsprogs, fake-send_arp, freesans, icp_qat_netkey, iproute2, iptables, ipset, jamvm, jfftp, jta, properJavaRDP (partly for java-getopt), kexec-tools, libnetfilter-contrack, libnfnetlink, linux-kernel, lrzsz, lzo, memtest86+, mgetty, net-tools, ntpclient, openswan, openvpn-gui, pciutils, pptpd, procps, , properJavaRDP, samba, smcroute, snort_inline, snort-community-ruleset, tinyproxy, tn5250, unicast_routing-quagga, usb_modswitch, usb-modswitch-data, QAT, qpimd, rtdot1x, wget, wireless-tools, wlan-rt2860-ap, xl2tpd, vnc , vmware-tools
OPENVPN LICENSE	openvpn, tapinstall
GNU Lesser General Public License 2.1 (LGPL 2.1)	dialog, freeradius-server, glibc, jscalendar, jcterm, jscolor, libfuse, libmnl, libnl, libdevmapper, libusb-compat, tokyocabinet , wvdial
GNU CLASSPATH LICENSE	classpath
The BSD 3-Clause License	b64, classpath(partly for relaxng), hostapd, libpcap, linux-PAM, lilo, openswan (partly for libblowfish), pimd, postgresql-jdbc3, ppp, radvd, tcpdump, uthash, yuilibrary
APACHE LICENSE 1.1 (APACHE 1.1)	jetty (partly for commons-el), xml4j
APACHE LICENSE 2.0 (APACHE 2.0)	commons-codec, commons-collection, commons-fileupload, commons-httpclient, commons-io, commons-ssl, derby, excanvas, google-gson, httpd, jasper-runtime, jetty, jetty (partly for commons-logging), properJavaRDP (partly for log4j), mDNSResponder, poi
PUBLIC DOMAIN (PD)	7zip-lzma-sdk, djbdns, tzdata, sqlite, ppp (partly for sha1), JSON

Do we *TRULY OWN* such  
devices?

# Signed Kernels

# TIVOISATION

**A repurposed Wi-Fi router to access broadcast by a local community radio station over a meshed wireless network.**



*[http://prayas.in/projects:ghumakkad\\_baaja](http://prayas.in/projects:ghumakkad_baaja)*

**Having liberated our**

***COMPUTERS***

***HANDHELD COMPUTING* Devices**

***INTERNET OF THINGS***



Have we *LIBERATED* our  
*NETWORKS?*

**Do we care what  
equipment power our  
*NETWORKS?***

Is *FREE SOFTWARE* our  
first choice for  
*NETWORKS*?

**What equipment can be  
built using FREE  
SOFTWARE?**

# **A GATEWAY ROUTER and FIREWALL?**

**The simplest *ROUTER*  
could be a *DESKTOP*  
with 2 Network  
*INTERFACES!***

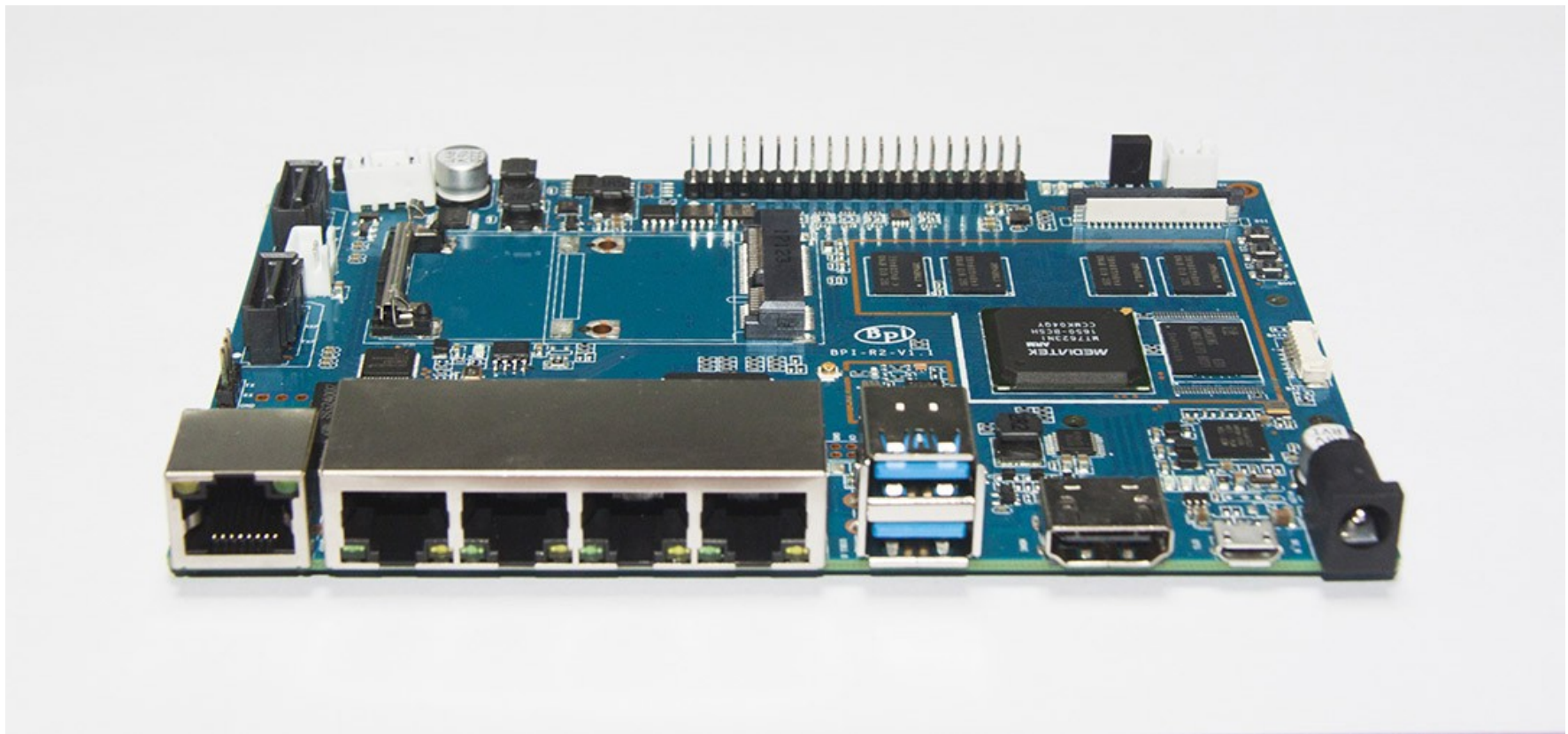


*PCENGINES APU*



*ESPRESSOBIN*





*BANANA PI R1*  
*OR*  
*OTHER PI BOARDS*

What about *SOFTWARE*?

**Any *GNU/LINUX* distro  
with *iproute2*,  
*netfilter/iptables*  
and supporting utilities**

**Why re-invent the  
wheel?**

**OpenWrt**  
Wireless Freedom



**ZEROSHELL**  
Net Services



 **OPNsense**<sup>®</sup>  
Your next open source firewall

 iptables made easy  
**shorewall**

**pf** sense<sup>®</sup>



**Alright! What else?**

**Wireless *ACCESS POINTS***

***TOR* on the gateway**

**Anything that you can  
imagine!**



**A gateway router with**  
***NEXTCLOUD!***

**Hold a thought and  
make it manifest :)**

**No kidding!**

**Join the community.**

**BUILD & SHARE**

**Is *FREE SOFTWARE***  
**suitable just for**  
***HOBBYISTS, HACKERS***  
**and *HOME-NETWORKS?***

Can *FREE SOFTWARE* be  
used to build  
*HIGH-PERFORMANCE* and  
*SCALABLE* Networks?

**Many *IXPs* use *BIRD* or  
*QUAGGA* for *BGP* routes  
propagation.**

Is it possible to build a  
*BUSINESS* that builds  
*NETWORKS* using *FREE*  
*SOFTWARE?*

# *SUCCESS* Story



# *FAILURE* Story

Why could we solve  
*SOMEONE'S* problem and  
not *EVERYONE'S*  
problem?

**Community creates  
solutions to solve  
*EVERYONE'S* problem.**

**And a *BUSINESS* has to  
solve *SOMEONE'S*  
problems.**

***ASSEMBLING* a solution  
for *SOMEONE* from  
*EVERYONE'S* solution has  
a *GAP!***

**The *GAP* is because  
*SOMEONE* doesn't want  
to dirty their hands.**

**There is a *COST* to**  
***FREEDOM!***

**It takes years to realise**

**that**

***COFFEE IS SWEETER***

***WITHOUT SUGAR!***



**To fill the gap,  
*BUSINESSES* need to  
*BUILD* solution.**

To fill the gap,  
*BUSINESSES* need to  
*BUILD* solution.

*FREE SOFTWARE*

**businesses like UNMUKTI**

**have their HEARTS &**

**MINDS at the right place.**

**But we lack**

***MITOCHONDRIA!***

**Because *INVESTORS* are  
*NOT EXCITED* about *FREE*  
*SOFTWARE!***

Imagine *5,000* more  
companies helping people  
build their networks with *FREE*  
*SOFTWARE!*

# Questions?

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