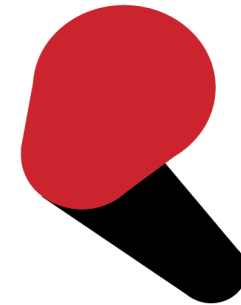


# Project Turris

<http://www.turris.cz/en>



PROJECT:  
**TURRIS**

Zuzana Duracinska • [zuzana.duracinska@nic.cz](mailto:zuzana.duracinska@nic.cz) •  
• **TF-CSIRT** • **Rome**

# Turris



What is Turris? Why its logo looks like “microphone”? Why to design and make another router? What is shared cyber defense? How can CSIRT team be involved?

PROJECT:  
**TURRIS**

# Turris

Latin word for tower Developed from scratch by CZ.NICService helping to protect a user's home networkNot-for-profit research project



# Turris... (research project)

## End user security:

Adaptive firewall based on collected data  
Regular updates

## Security research

Probes close to end users  
Distribution in different networks  
Anomaly detection

# Turris... (more than a research project)

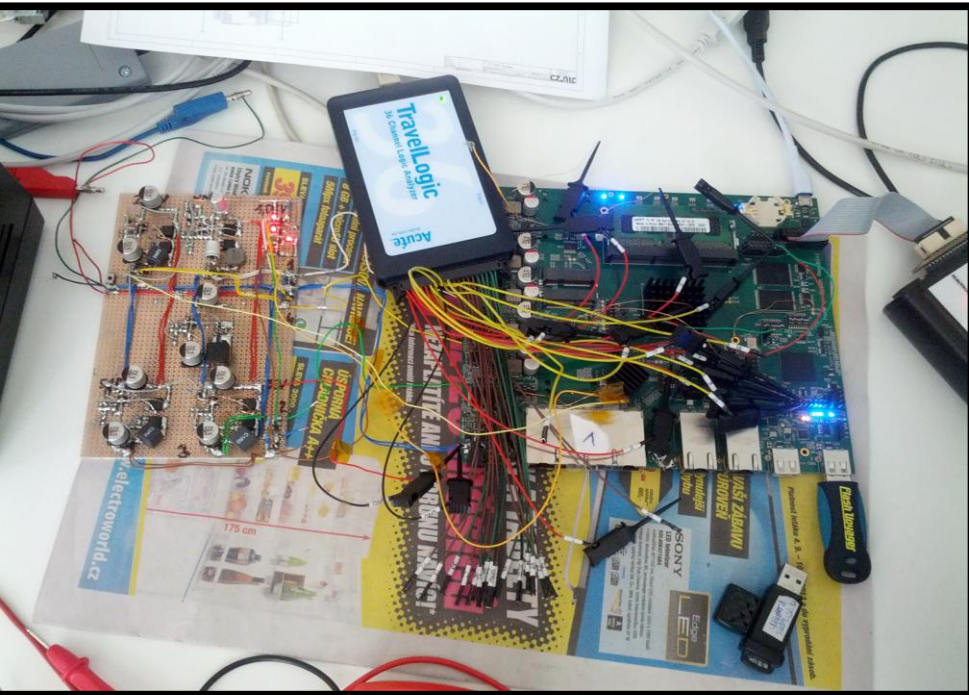
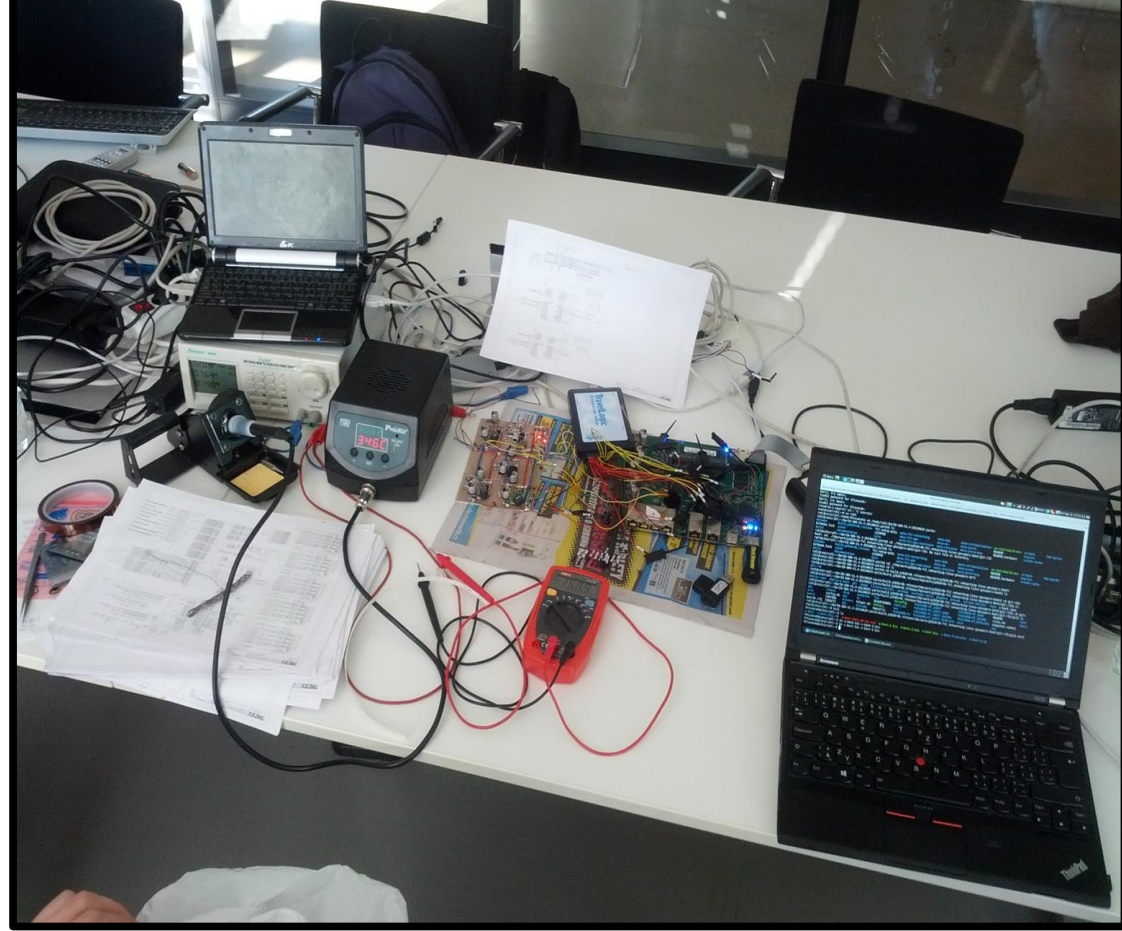
SOHO routers

Bad support of IPv6, DNSSEC  
Many problems with  
DNS  
Limited security features

Measurements

IPv6  
DNSSEC

# Can we design a SOHO router?



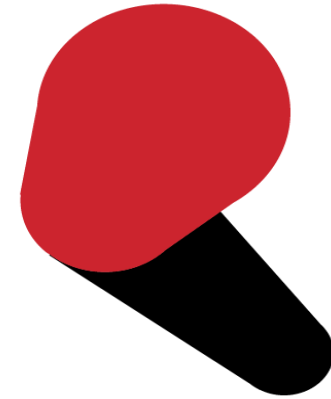
Yes, we can (and it's working)

**Hardware**

**Software**

**Security**

**Privacy**



PROJECT:  
**TURRIS**

# Turris...hardware

Wifi 802.11 a/b/g/n – 3x3 MIMO  
2x USB 2.0  
UART,  
SPI, I2C, GPIO  
Free microSDHC slot  
ATSHA204 –  
crypto chip  
Low power consumption  
Open source -  
CERN Open HW License



# Turris...hardware

Freescale PPC 1.2GHz dual core  
2GB DDR memory – slot  
256MB NAND + 16MB NOR flash  
5x LAN Gbps ports (2Gbps to CPU)  
1x WAN Gbps port (directly to CPU)  
2x miniPCle (1 occupied by wifi)

# Turris...software

Open source – based on OpenWRT  
Own configuration wizard – based on  
NETCONF  
Automatic updates  
Crypted communication with central server

# Turris...software

IPv6, DNSSECData collection- firewall logs- router logs (SW problems)- anomaly detection- modular system for data collection and reporting- real time network traffic monitoring (framework called uCollect)

# Turris...privacy

Agreement with end users  
Separate DB for accounts and data  
ISO27001  
Consulted with personal data protection authority  
POSITIVE Big Brother Awards CZ 2013

# Turris...security

Focus on a security of a home network  
Automatic updates  
Distributed adaptive firewall

1. Collection of input data (from end users devices)
2. analysis of data on central server
3. preparation of firewall rules
4. update of end devices

# **Turris...the point when CSIRT.CZ comes in**

Data, data, data...Help with data analysis  
Usage of other data sources to update firewall rules  
Help with firewall updates



**Distribution to end users?**

# Turris

Apprx. 4000 requests  
Leasing 3Ys + selling  
off  
Leasing for 1 crown (0,04 EUR)  
User selection  
based on provider and location (to ensure  
diversity)  
Main router connecting to the  
Internet  
Non-stop operation

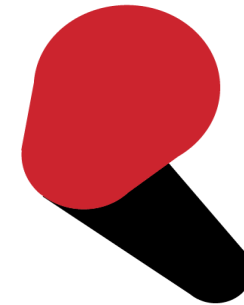


# Future plans

Batch of 800 improved routers coming out at the end of the year...  
Software improvements  
Mobile apps using the netconf interface  
Make firewall rules available for other platforms  
Extend the OS to more routers

# Project Turris

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