

Domain 4: Massively distributed clouds

➔ Goal: improve sovereignty and privacy

- Non hierarchical and massively distributed cloud
 - “Freedom in the cloud” by E. Moglen, Feb 2010
see <http://www.2020flossroadmap.org/2010-version/>
 - From SeaMicro to ViFib or Hedera Tech, from Marvell ShivaPlug (TonidoPlug, PogoPlug, Ctera CloudPlug, Axentra HipServ, Eyecon, ...) to TI Beagle Board and Open Hardware
- Next generation cloud architecture
- New home services (private cloud): *“access your applications, files, photos, music and media from anywhere via a web browser “*

➔ Challenges

- Large scale distribution, super elasticity and automation for massively decentralized systems
- Security, safety and privacy e.g. cryptography for the masses, personal control
- Energy efficiency on massive scales
- High speed public network

➔ Use Case: domestic cloud for citizens

➔ Technologies

- Key R&D trend for next 5 years with technological challenges

➔ Partners

- Research: INRIA (J-B. Stefani, F. Lefessant, P. Merle), CNRS (E. Benazera)

➔ Resources

- Which collaborative projects? ANR, FP7, FUI, Grand Emprunt, Economie Digitale

LONG TERM
Discussions
in Progress

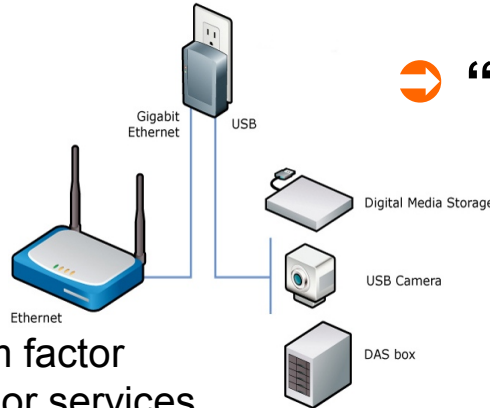
Massively distributed clouds

Specifications (as for 2010)



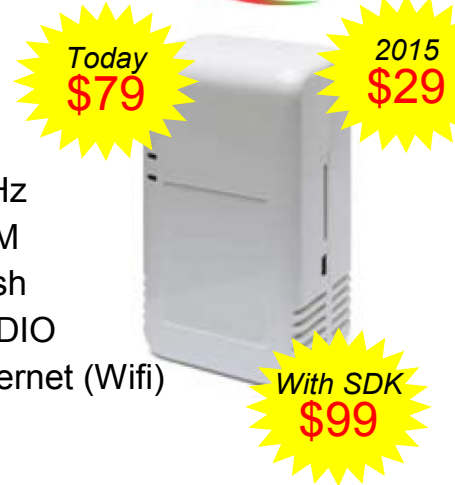
➔ Features

- **Mobile**
 - pluggable on network
- **User friendly**
 - “wall wart” form factor
 - set-up by vendor services
- **Smart appliance**
 - automated boot
 - network connectivity (dynamic IP address)
 - data synchronization (personal data from any social networks)
 - encrypted backup to trustworthy clouds with multiple replication
 - secured connection with trustworthy clouds
- **Power efficient**
 - green computing device



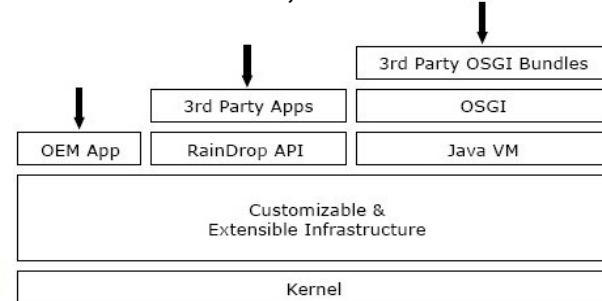
➔ “Open” HW

- ARM 1.2GHz
- 512MB RAM
- 512MB Flash
- USB 2.0, SDIO
- Gigabit Ethernet (Wifi)
- 5 -7 Watts



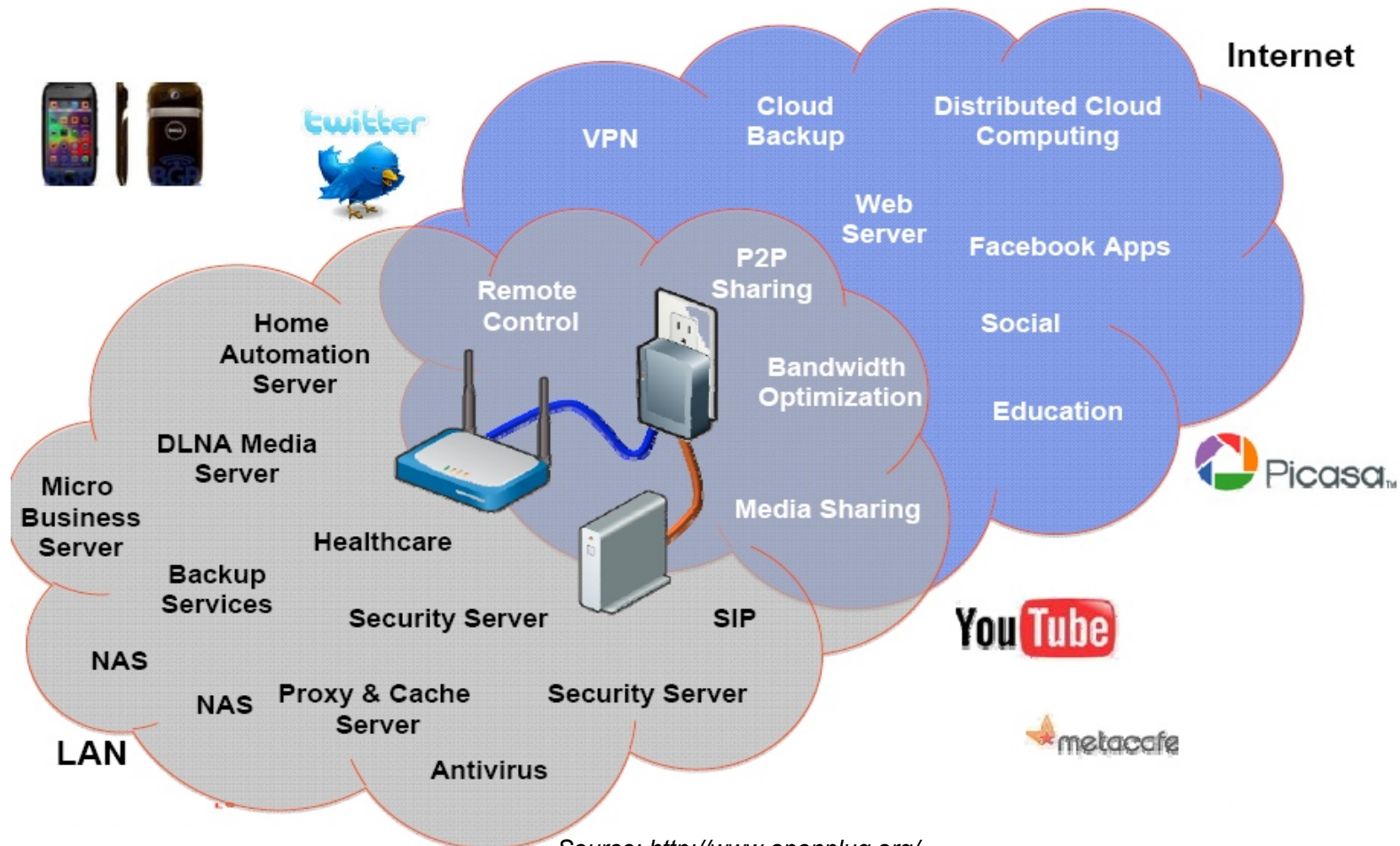
➔ F/OSS

- OS: GNU Linux, TCP/IP, HTTP server (Apache, lighttpd, tiny httpd, ...), VPN, Backup + **SDK**
- OW2 cloudware: JOnAS, Petals
- Social: Plexus, Diaspora, Torrent, Identi.ca ...



Massively distributed clouds

Architecture (as for 2010)



Source: <http://www.openplug.org/>

http://www.youtube.com/watch?v=3y72F3SDjM4&feature=player_embedded

Massively distributed clouds

Architecture (as for 2015 - Draft)

