

# A Look at Energy Efficient System Opportunities with Community Network Clouds

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Workshop on Energy-Efficient System (EES)

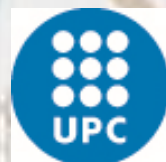
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# Community Networks

What's this? A cooperative development of a network

Where: Local, community (city, region, area)

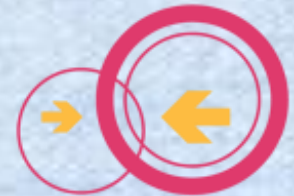
Who: You, and your neighbors, ...

“Don't buy the network, be the network!”

Scalable, self-organized and decentralized IP networks and services built and operated by citizens for citizens

But what services are in the network?

What do you use it for?



freifunk.net

guifi.net

OXFF FUNKFEUER  
FREE NET

AWMN

ninud.org



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# Community Clouds

The vision of cloud-based services in community networks

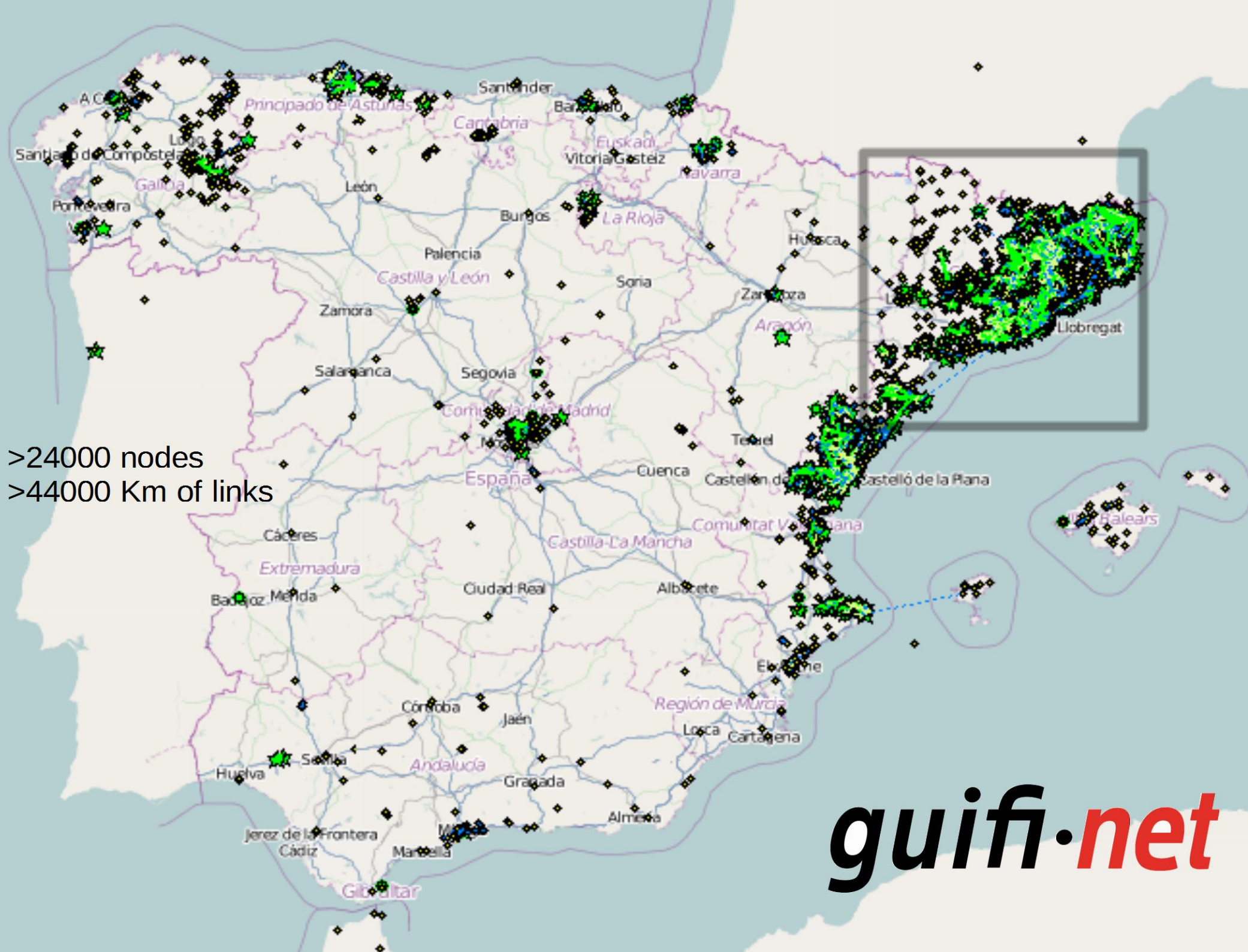
We are talking about a *specific community cloud*:

- built in community network
- hosted on community-owned computing and communication resources
- providing services of local interest

Cooperative deployment and maintenance of clouds by citizens for citizens

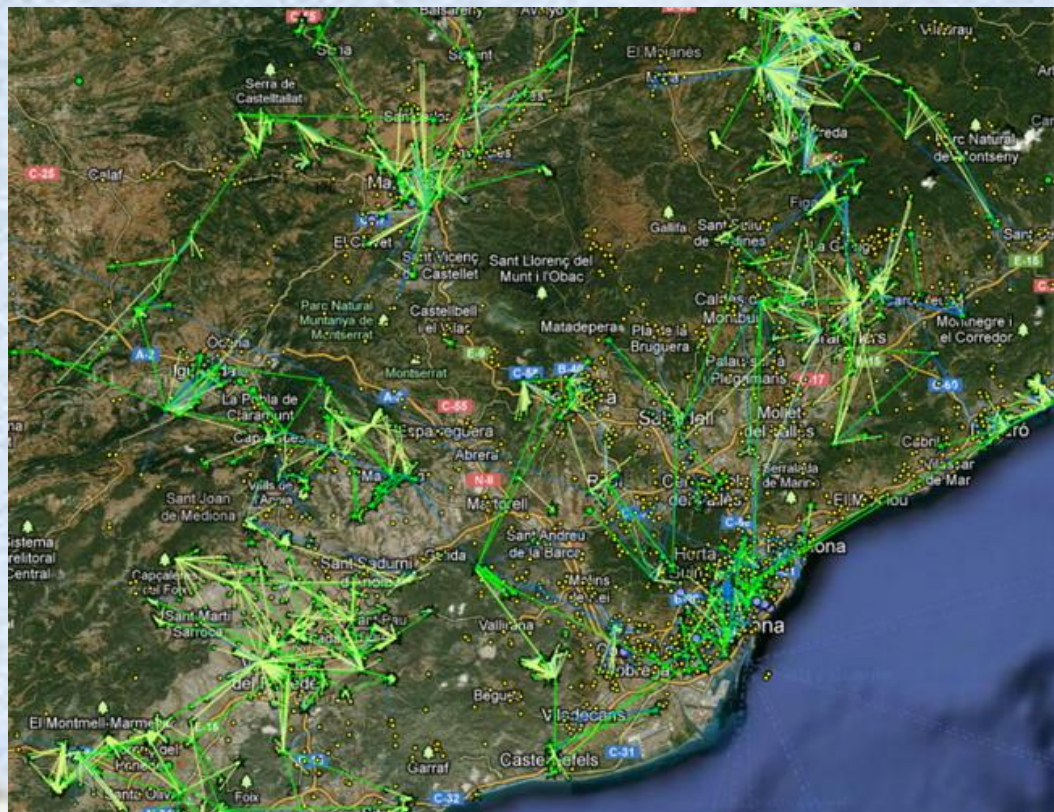








# guifi·net





# Hardware in Community Cloud

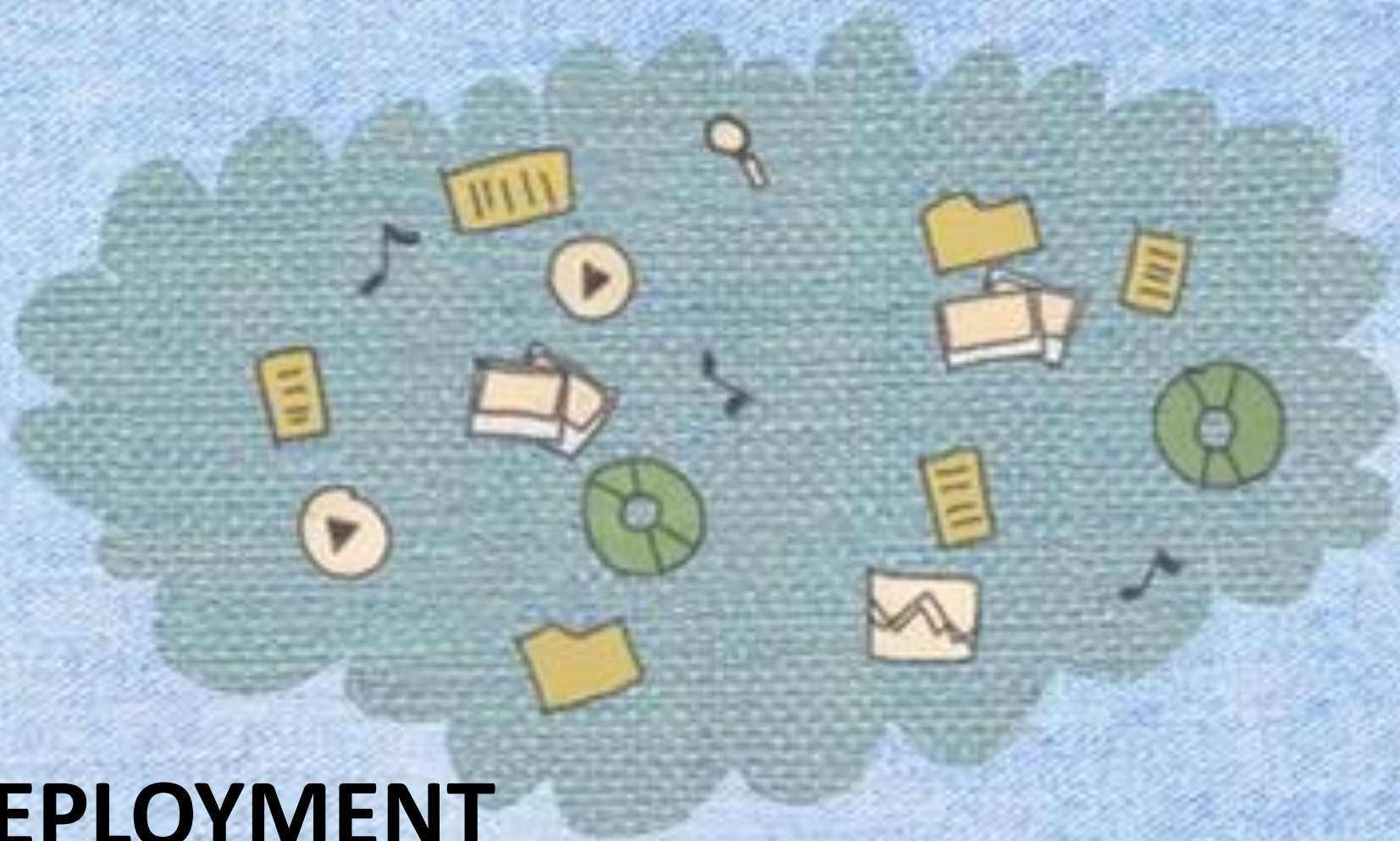




# For People, By People





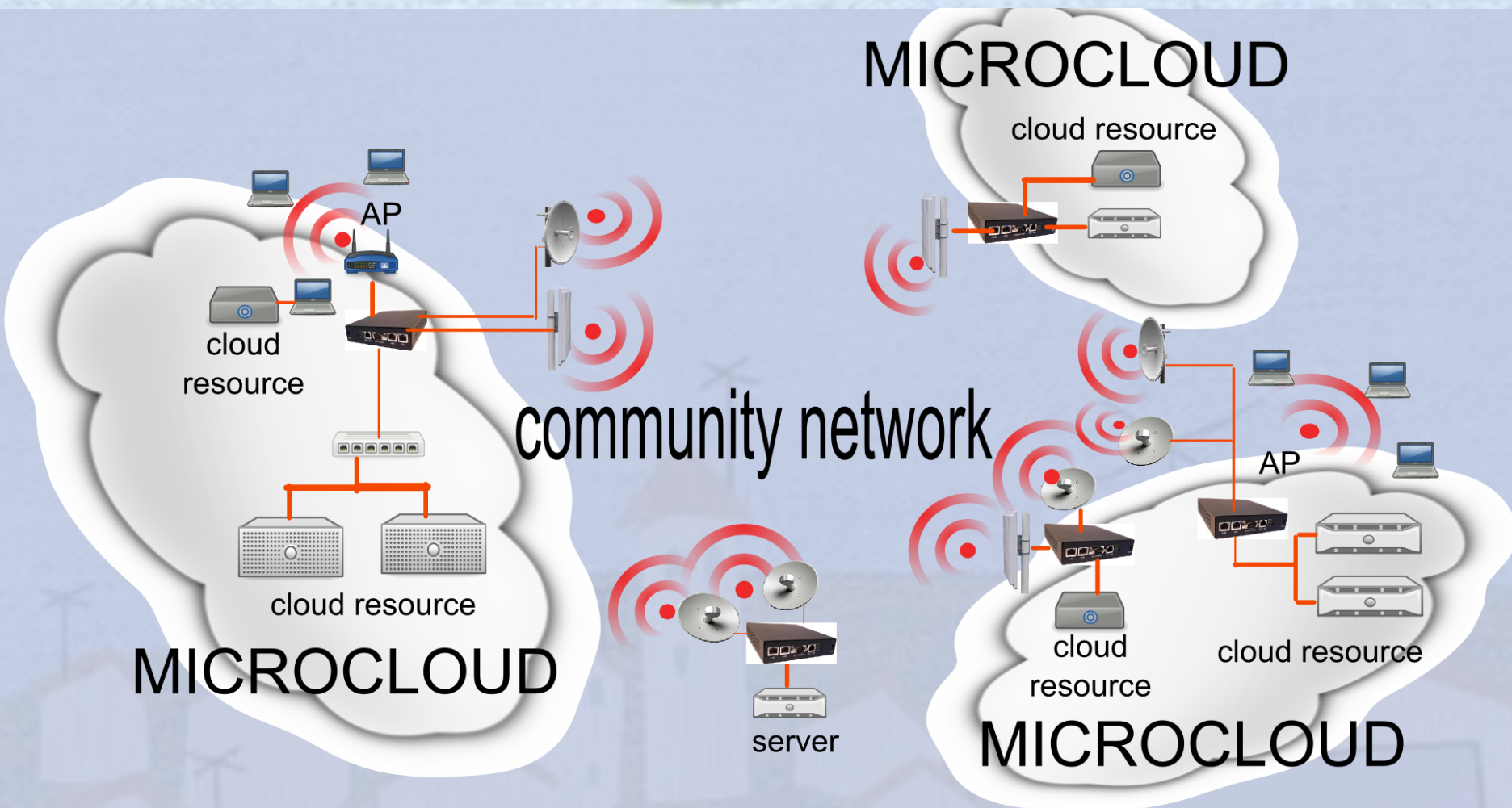


# DEPLOYMENT



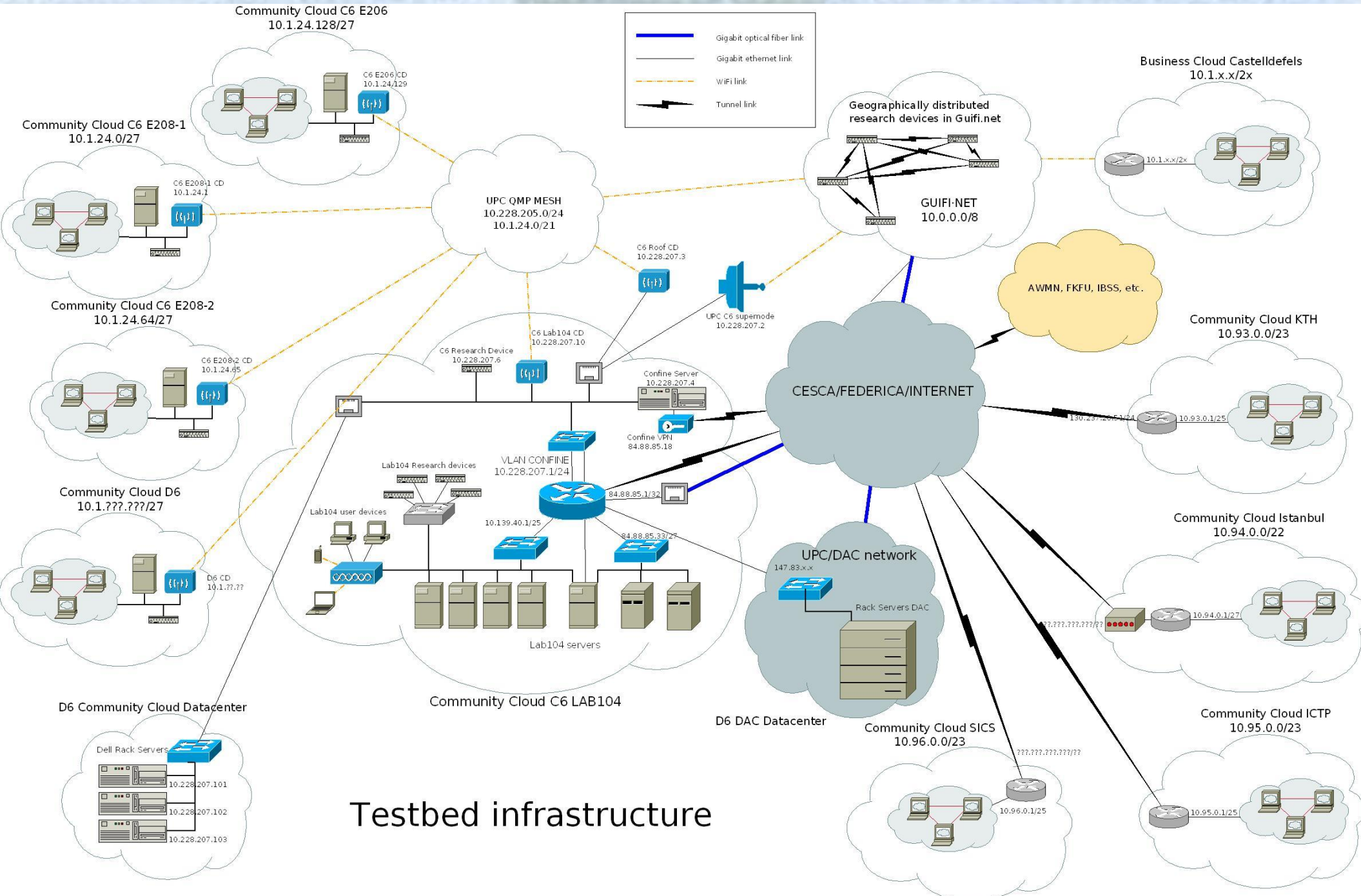


# Micro-Clouds



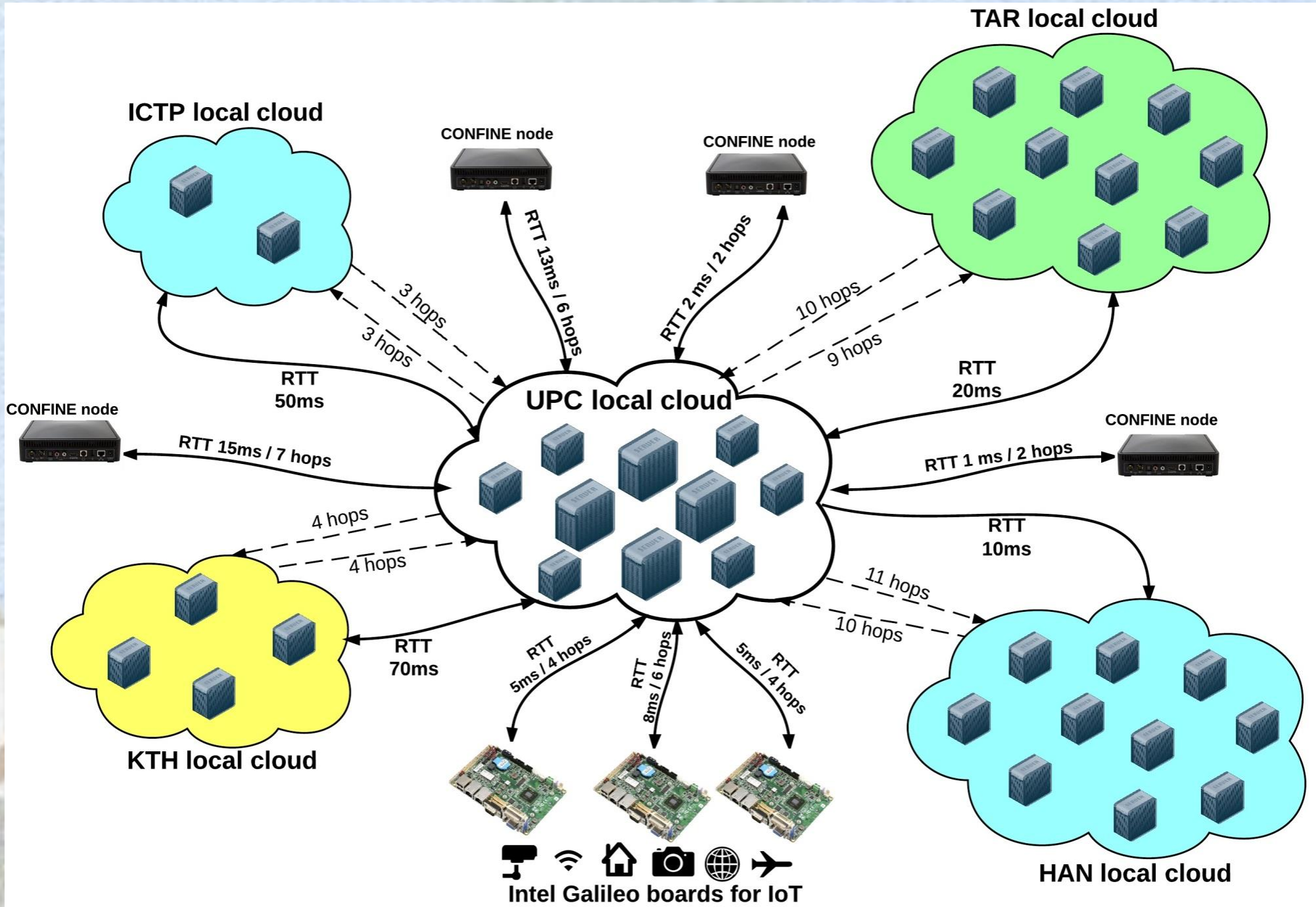


# Testbed Infrastructure



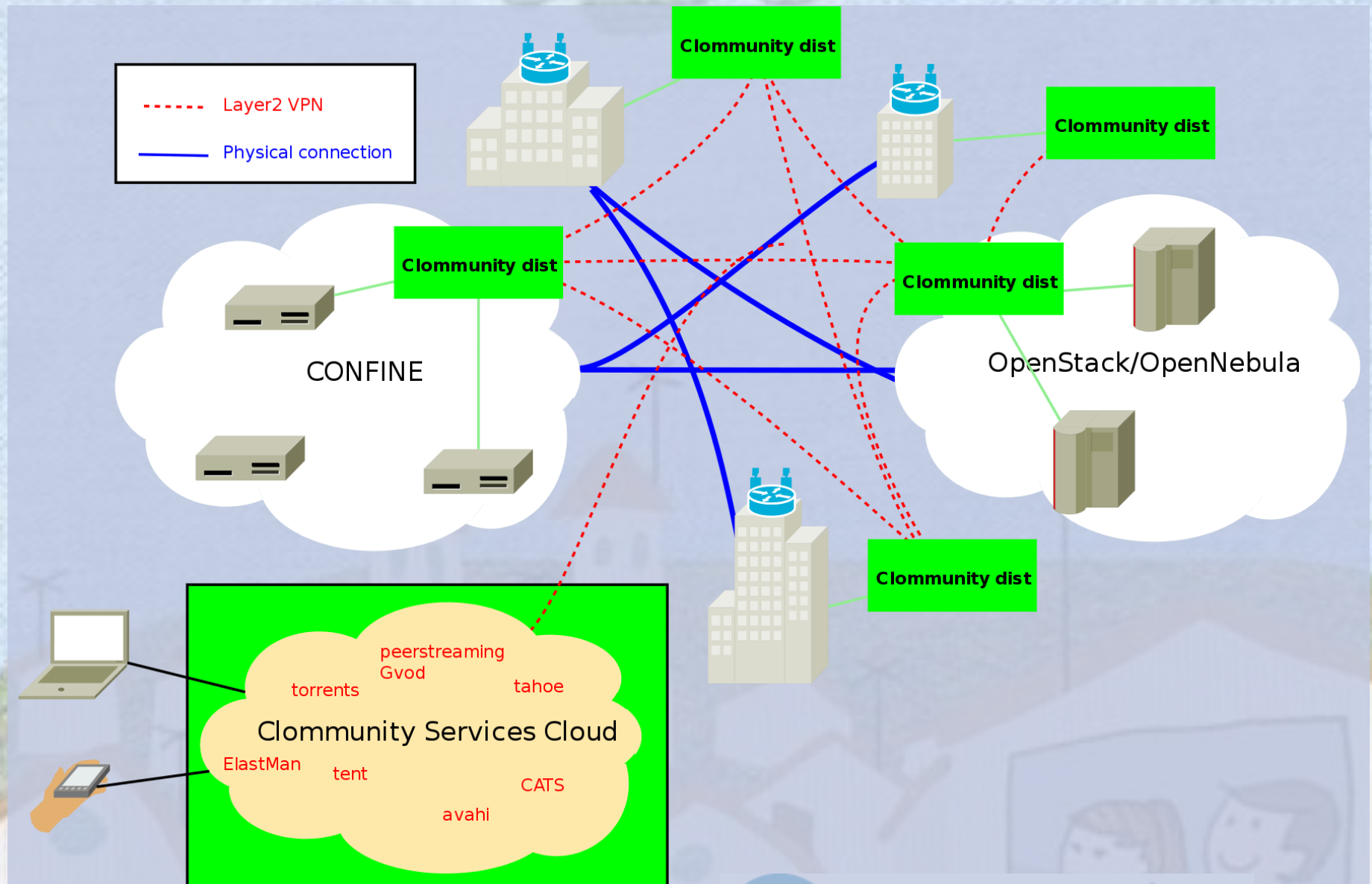


# Storage Service Experiments





# Cloudy Linux Distro





# SUPPORT FOR ENERGY EFFICIENT SYSTEMS



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# Energy Efficient Resource Allocation

Federation of heterogeneous Micro-clouds

Selecting energy-efficient infrastructure

Heterogeneity helps in optimizing energy usage



# Using Low-Powered Devices

Energy efficient infrastructures for cloud computing with low-powered devices

Customize existing cloud platforms for energy-efficient hardware

Community-Lab deployment with low-powered hardware



# Smart Grid Support

Smart Grid with advanced metering for facilitating efficient power usage

Smart Grid requires infrastructure for data storage and processing

Community cloud can provide back-end for processing and storage connected through community mesh networks





An illustration on a textured, light brown background. In the foreground, a girl with brown hair in a ponytail and a boy with dark hair are shown from the chest up. The girl is on the left, looking slightly to the right with a thoughtful expression. The boy is on the right, looking down with his hand near his chin, also appearing thoughtful. Above the girl's head is a large, light yellow thought bubble. Inside this bubble is a blue, cloud-like shape containing several small grey house icons connected by thin black lines, representing a network. To the right of the children, there is a small rectangular inset showing a village scene with white houses and two prominent white towers with brown roofs under a blue sky.

# RESEARCH WITH COMMUNITY NETWORKS





# Digital Ecosystem for Sustainability



Voluntary Computing  
P2P Distributed Storage  
Computational Grids  
Digital Ecosystems  
Green Computing



Community Networks  
Wireless Mesh Networks  
Bottom-up Broadband  
Social Networks  
Sustainability

Folding@home

## Community Cloud



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**Call for the ICT for development and sustainability research community to exploit community cloud and community networks as a different IT infrastructure model for the future for supporting innovative, sustainable, adaptive, scalable, integrated, autonomic solutions**







CLOMMUNITY

# A Community networking Cloud in a box

**Thank you**

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