On Supporting Service Selection for Collaborative Multi-Cloud Ecosystems in Community Networks

Amin M. Khan, Felix Freitag, Smrati Gupta, Victor Muntès-Mulero, Jacek Dominiak, Peter Matthews

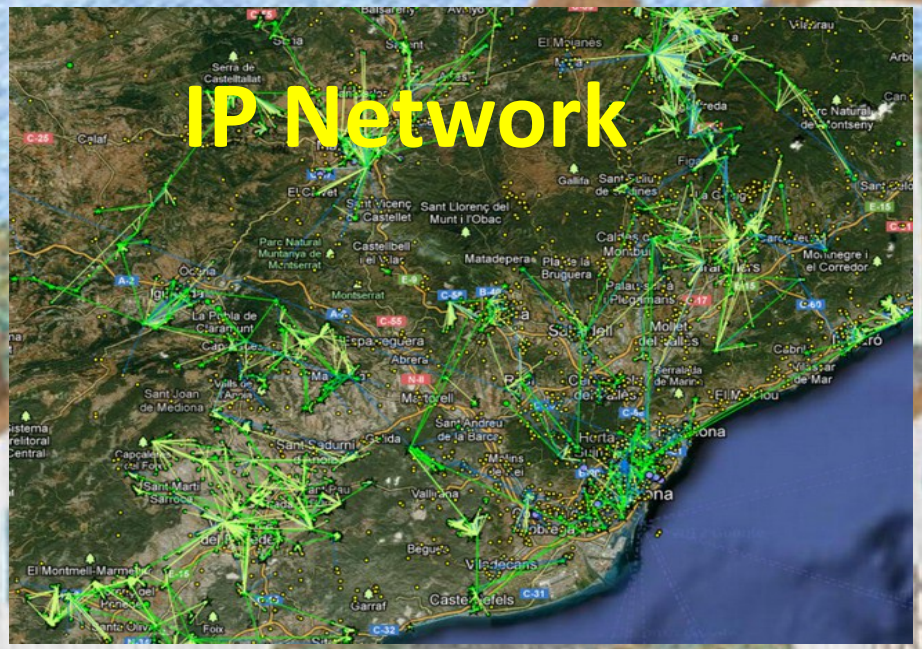
Technical University of Catalonia, BarcelonaTechCA Labs,
CA Technologies. Barcelona, Spain

The 29th IEEE International Conference on Advanced Information Networking and Applications (AINA-2015)

Gwangju, Korea, March 25-27, 2015

Presenter:
Felix Freitag
felix@ac.upc.edu

Community Networks



ninux.org

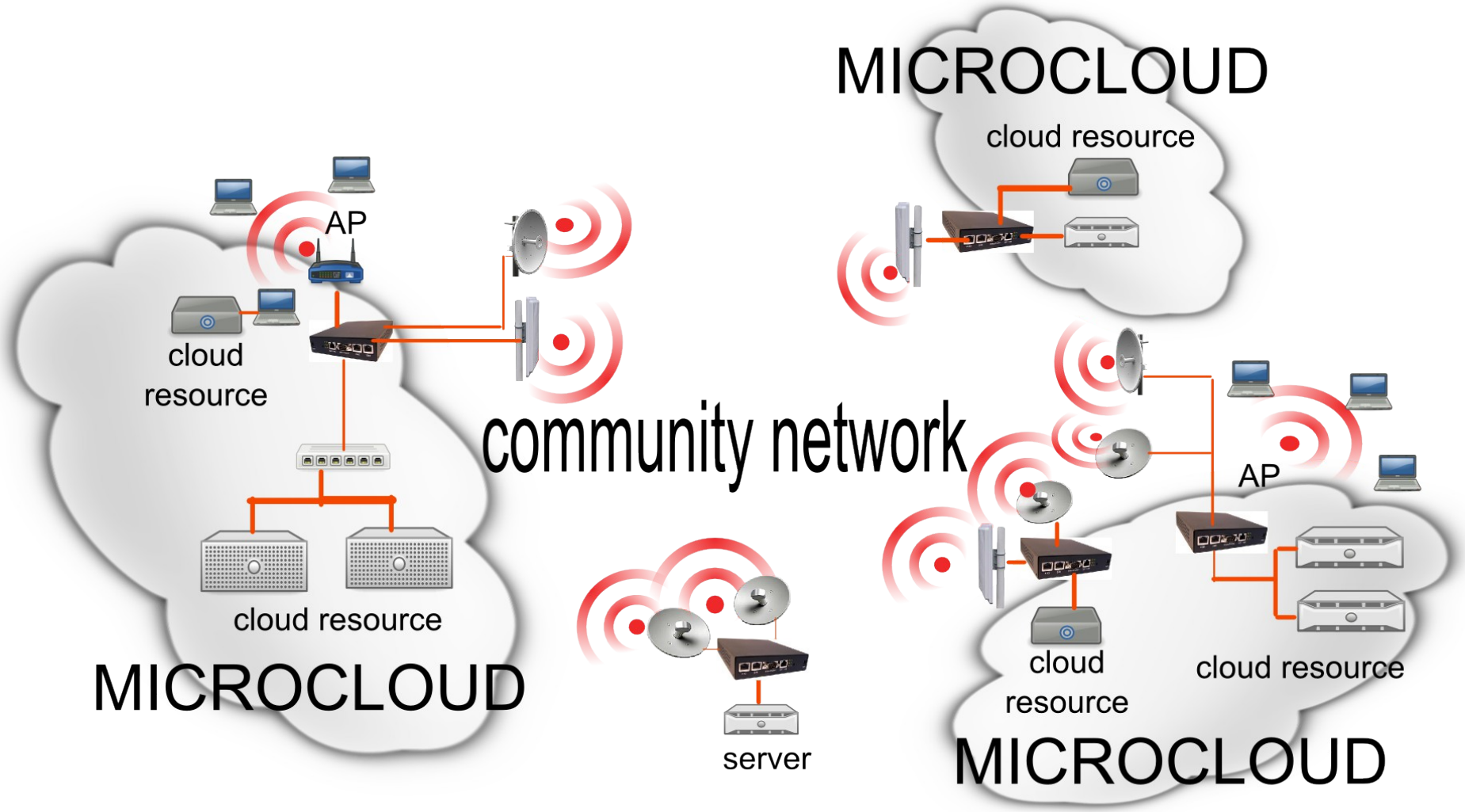
guifi.net

0xFF FUNKFEUER FREE NET

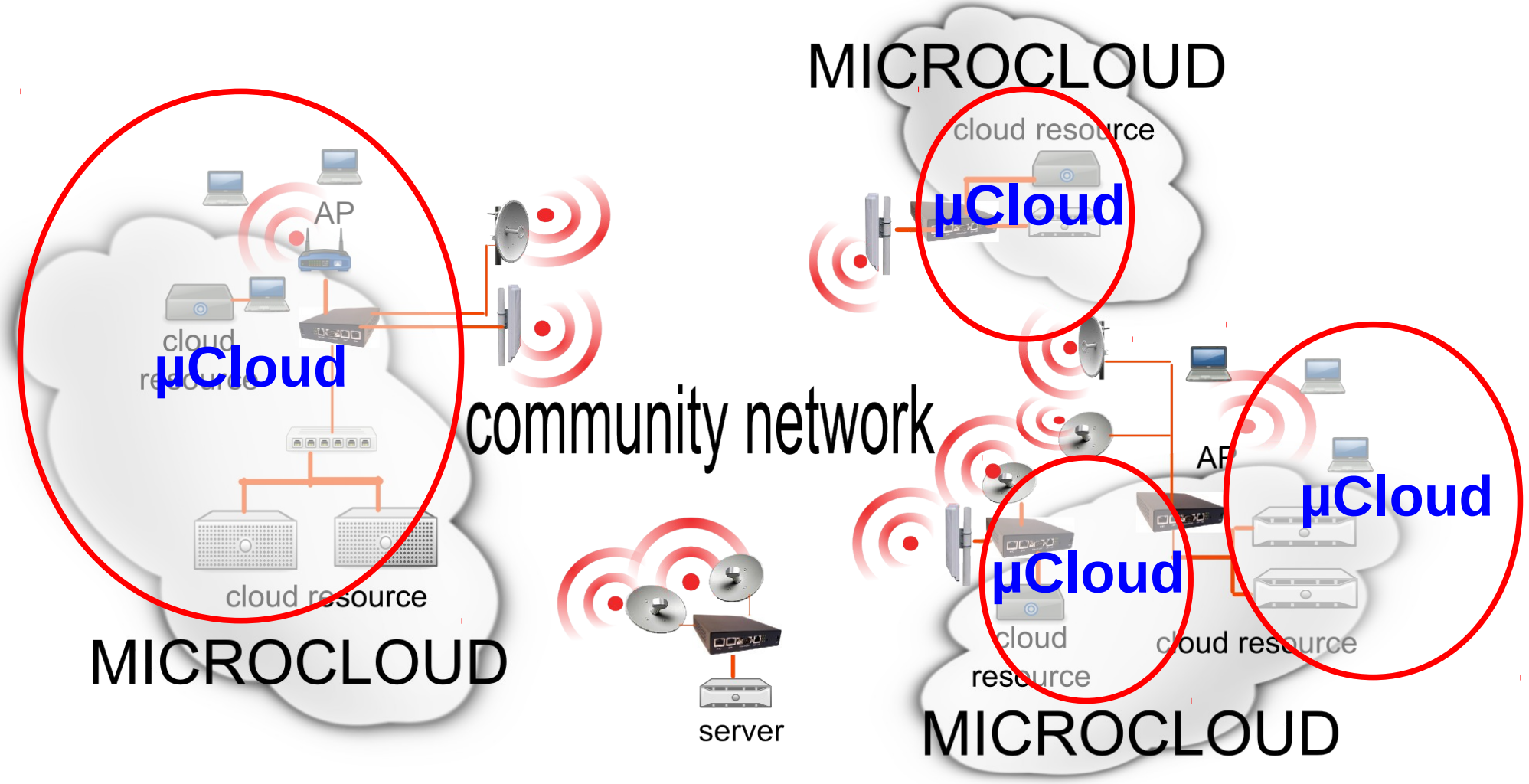
freifunk.net

AWMN

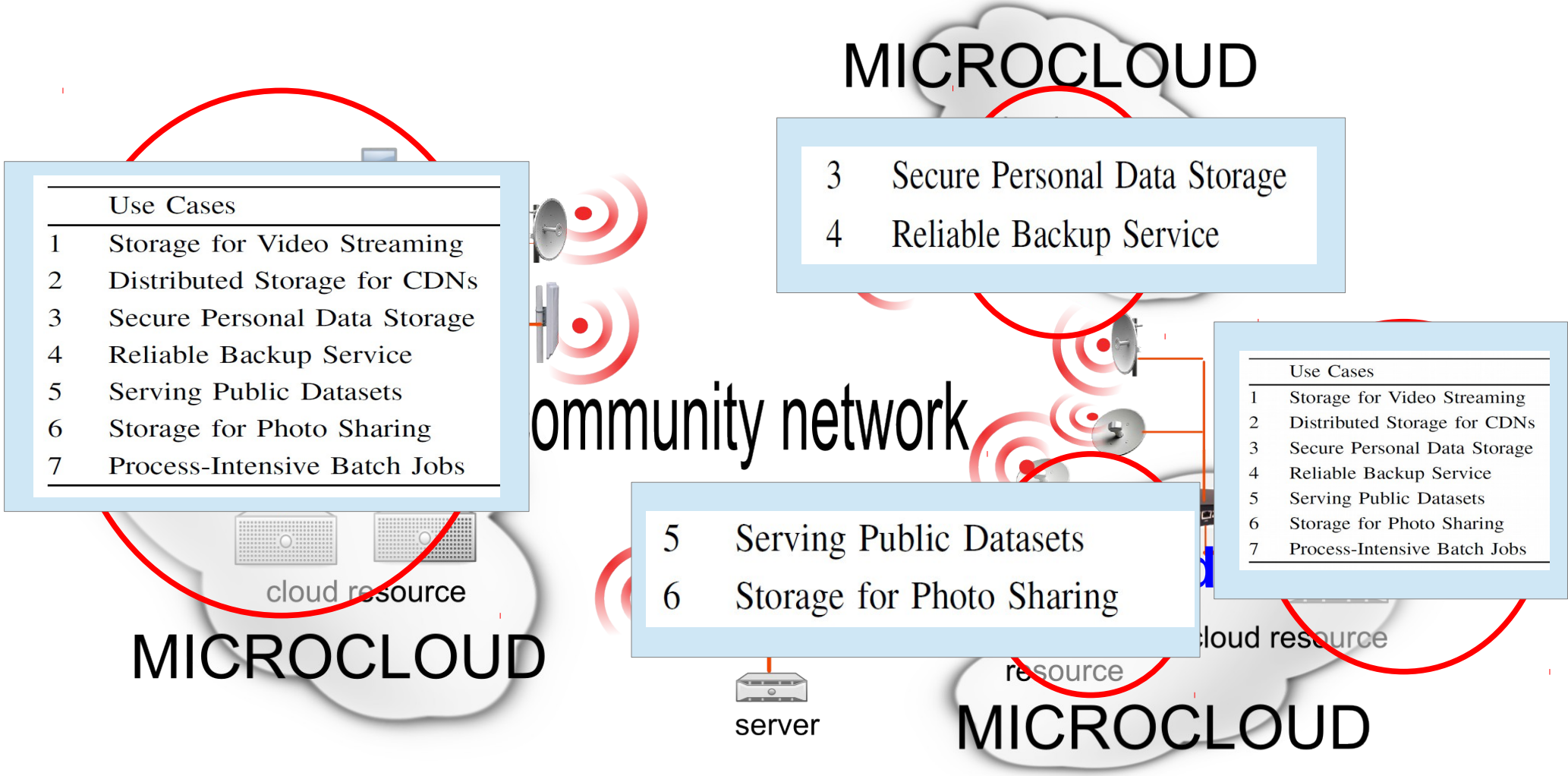
Expected scenario



Microclouds



Several service providers

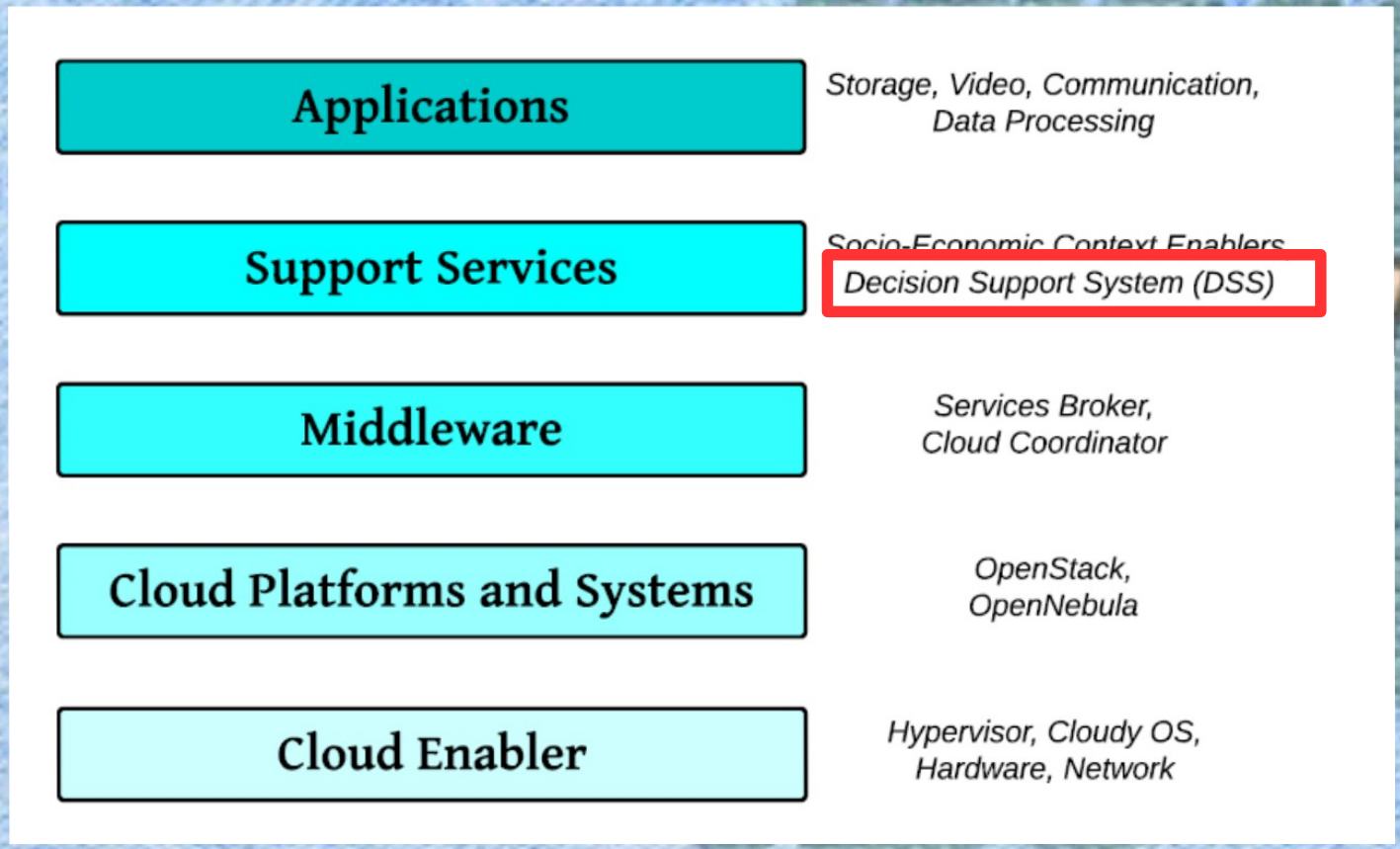


How can we help users to selects among multiple cloud service providers?

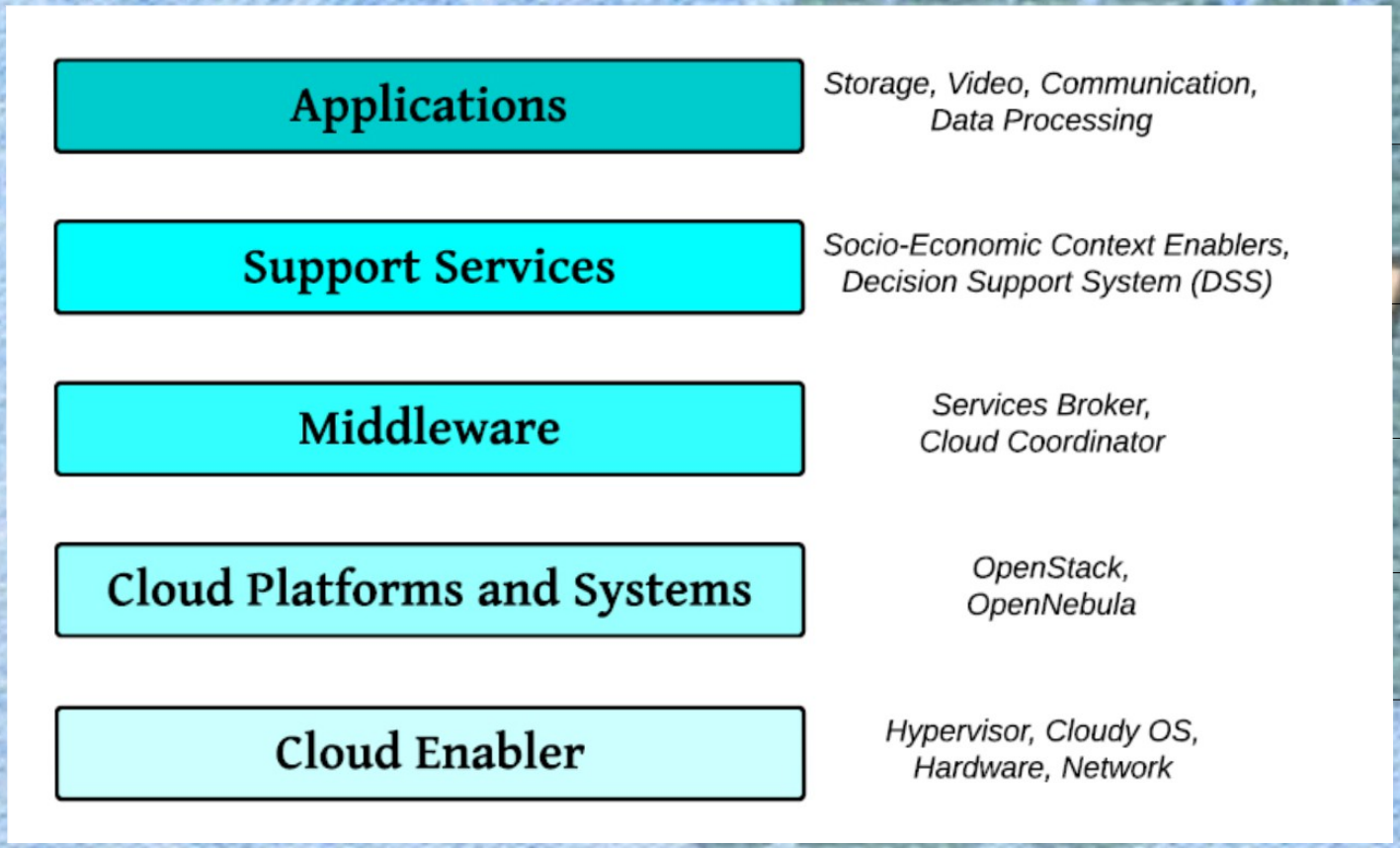
***We follow a practical approach*:**

- architecture
- build the community network cloud
- deploy real services
- address challenges

Layered architecture



Solutions chosen



Solutions chosen

Tahoe-LAFS, ownCloud, Peerstreamer, BitTorrent

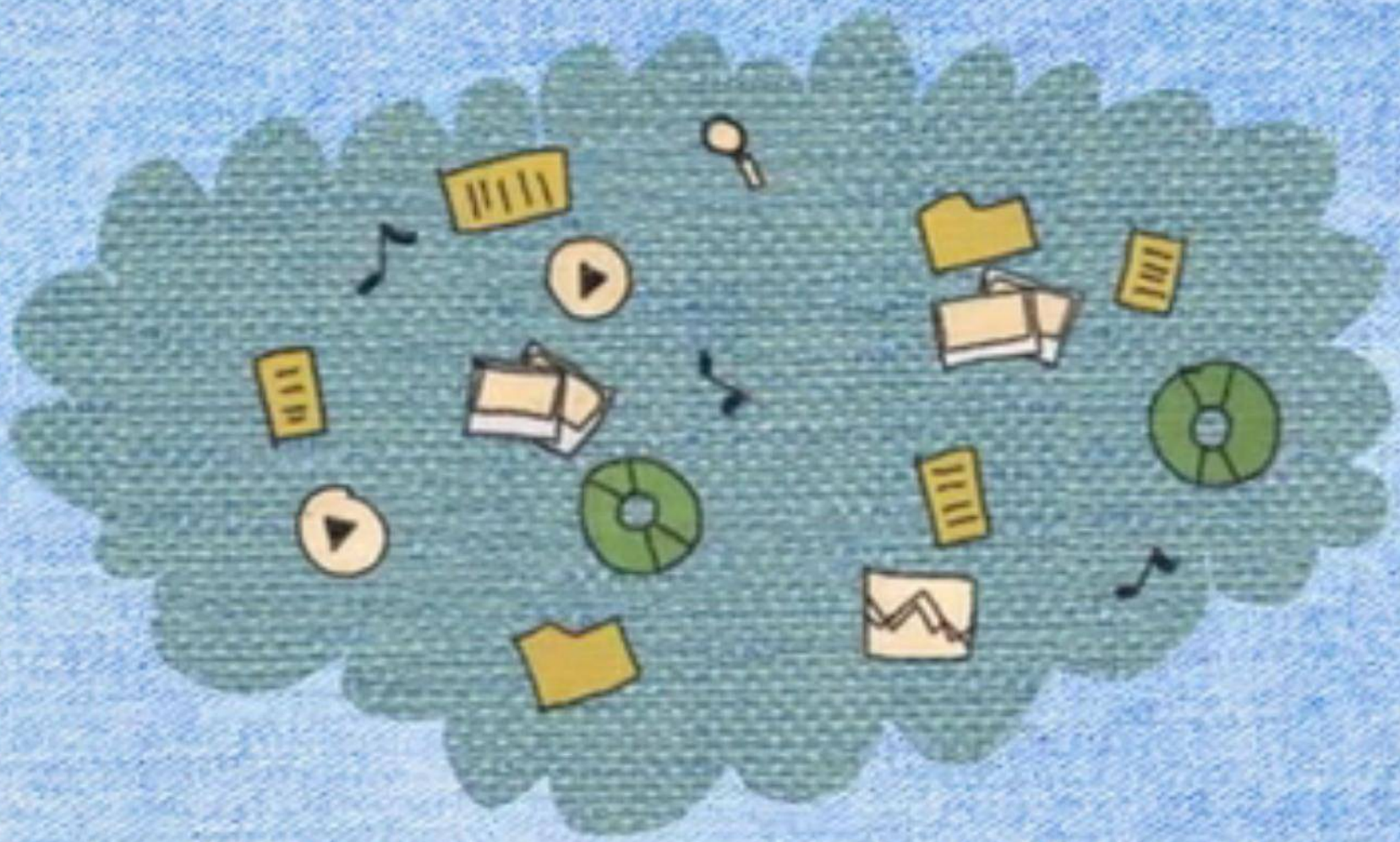
DSS Web application
Service quality measurement

Cloudy distro

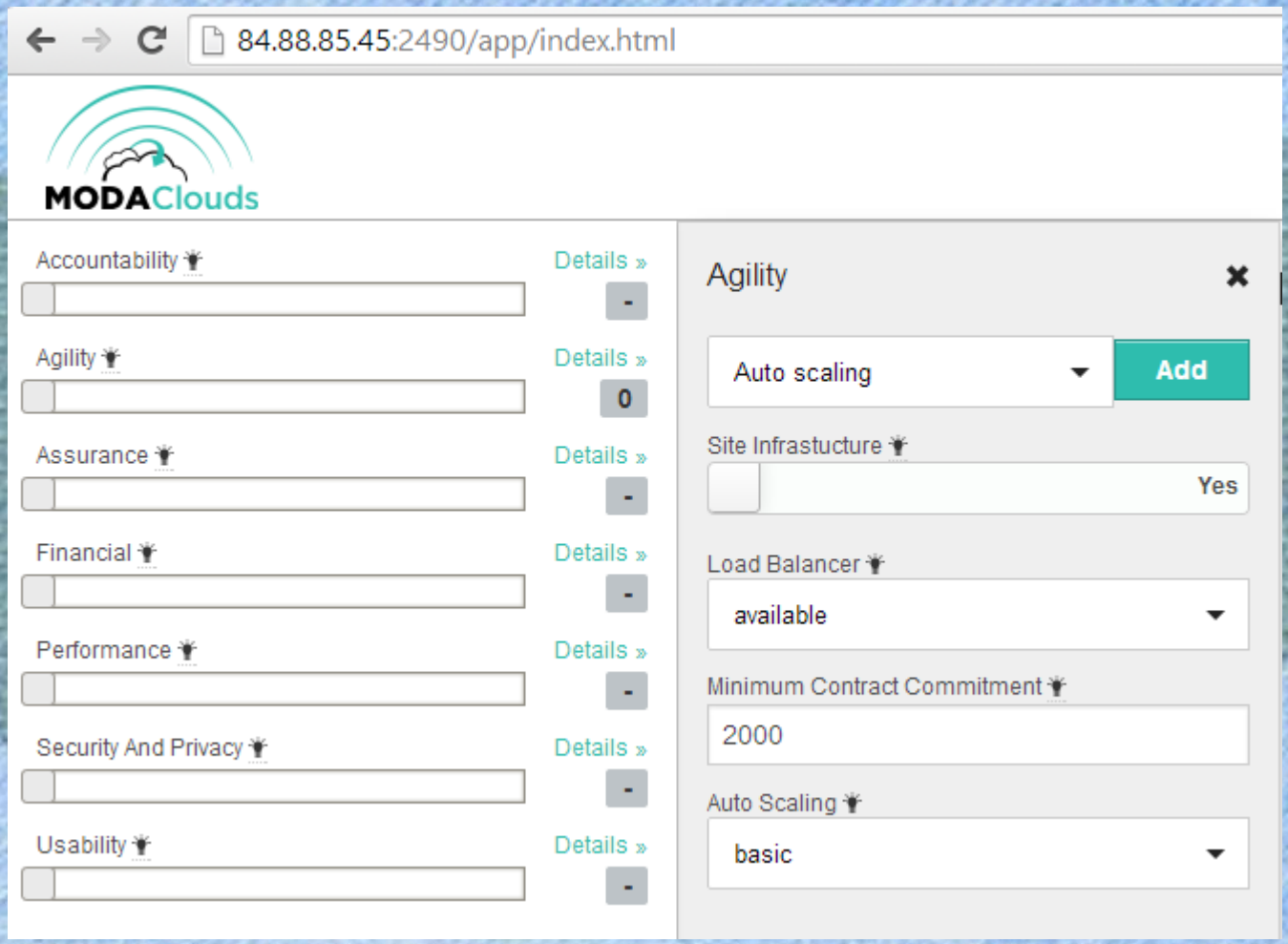
OpenStack, Eucalyptus, Proxmox, Confine

KVM, LXC

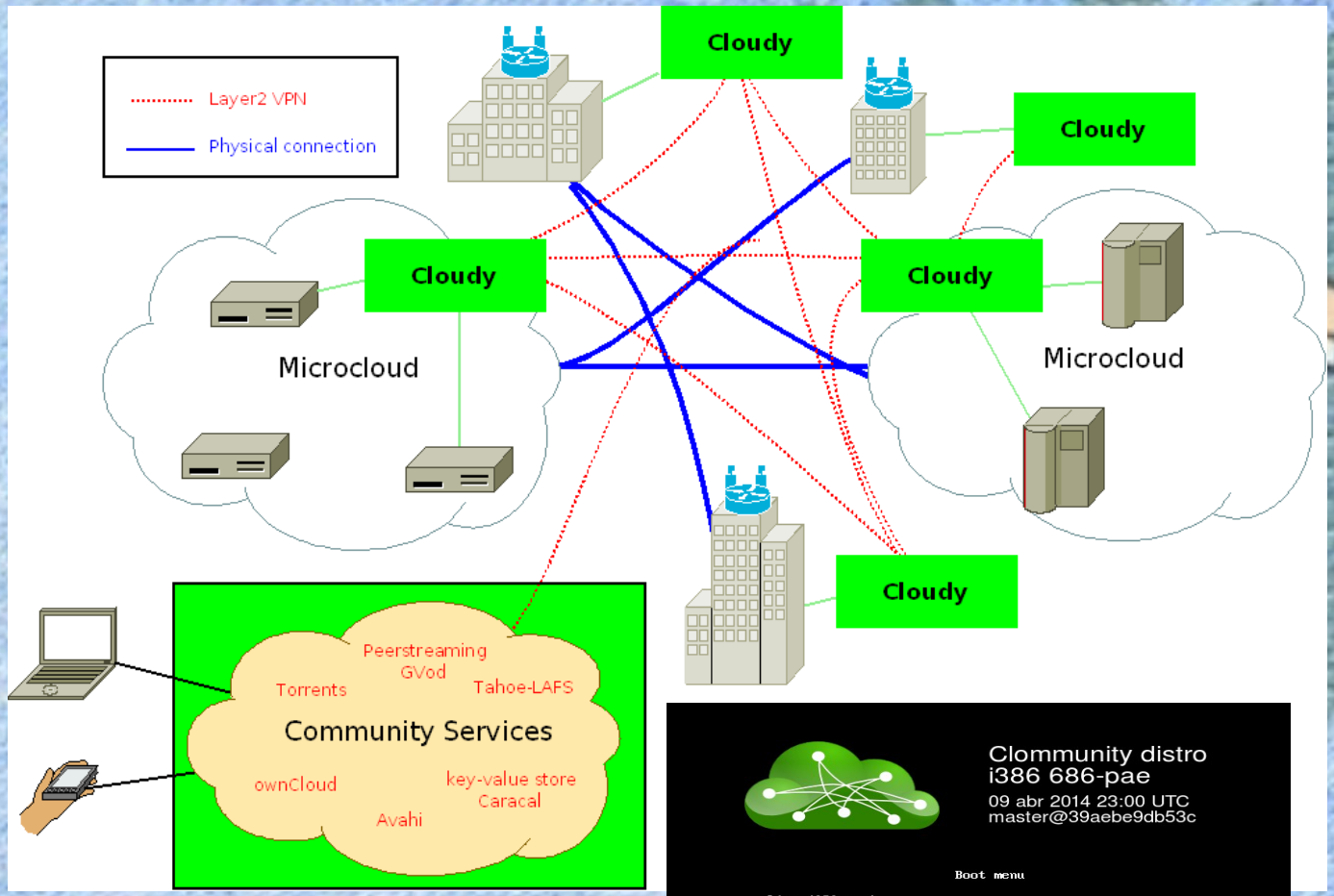
Cloud Deployment

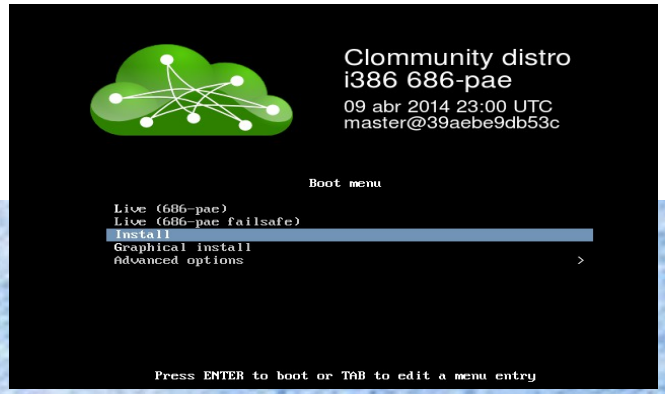


DSS Web application



Cloudy distribution





Cloudy is:

Debian-based Linux distribution

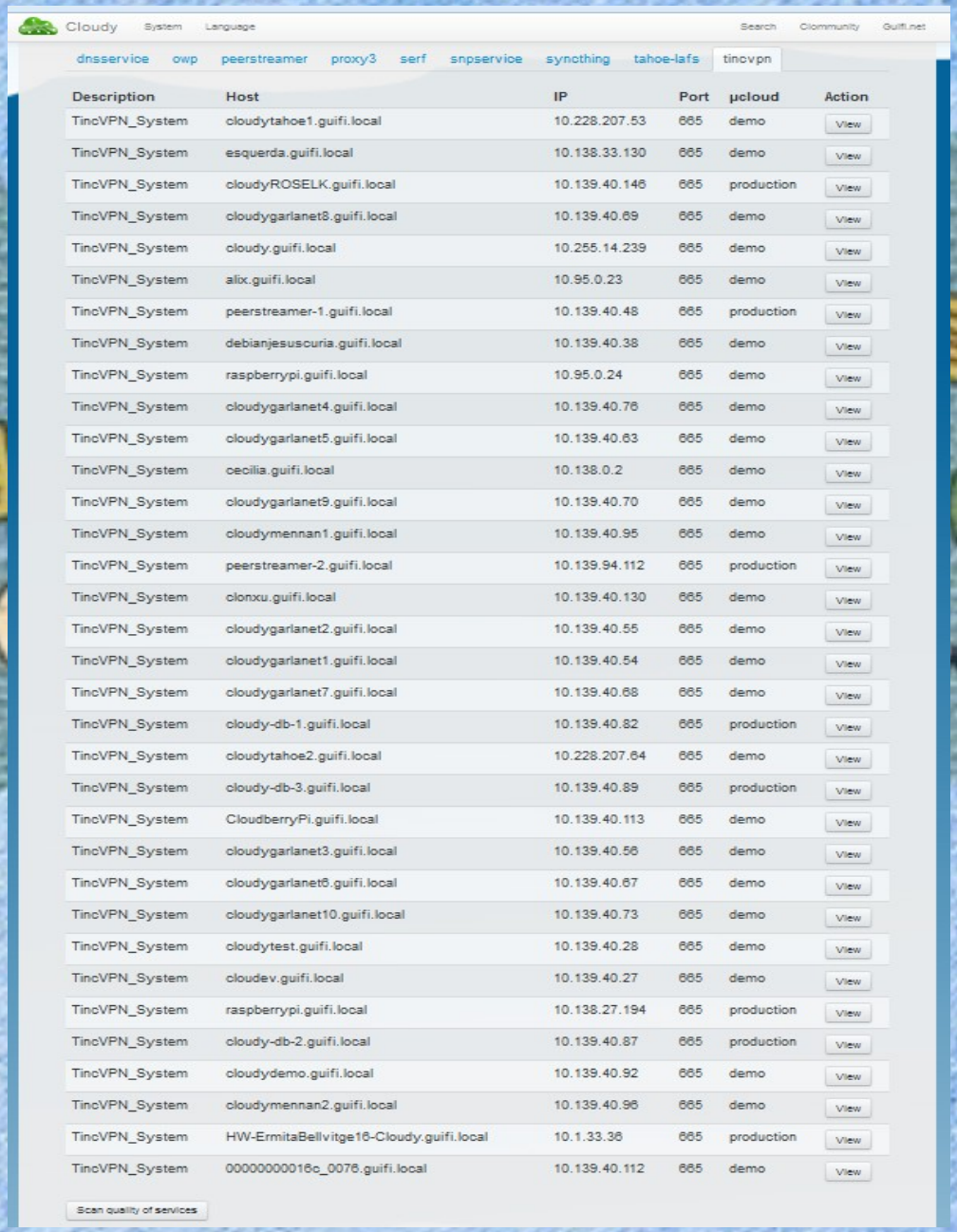
Contains cloud services (Tinc&Avahi) and applications (Tahoe-LAFS, Peerstreamer, VoIP)

Contains some CN-specific tools

To be installed in VM or “bare metal”

Cloudy download: http://repo.clommunity-project.eu/images/

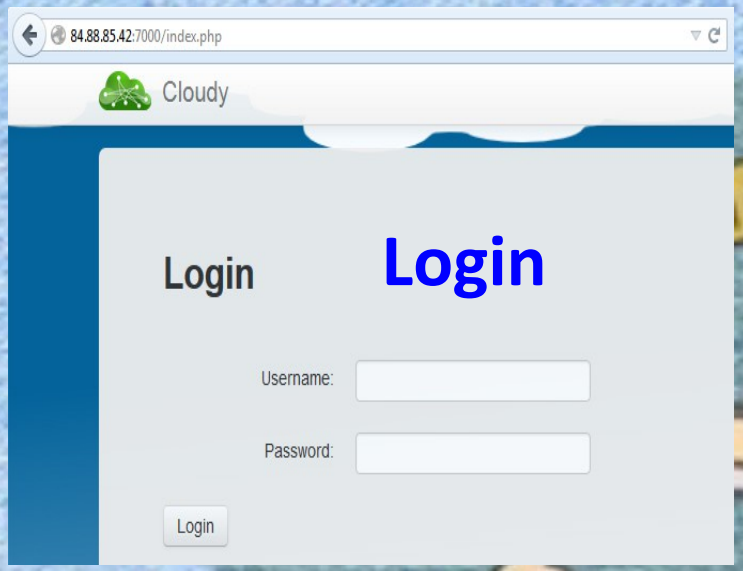
Community cloud nodes deployed

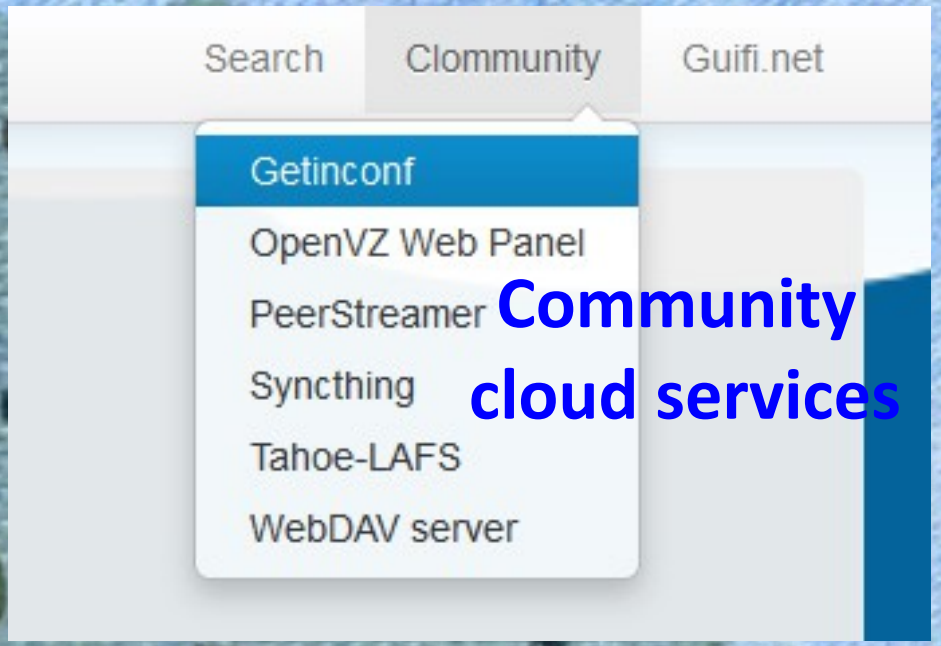


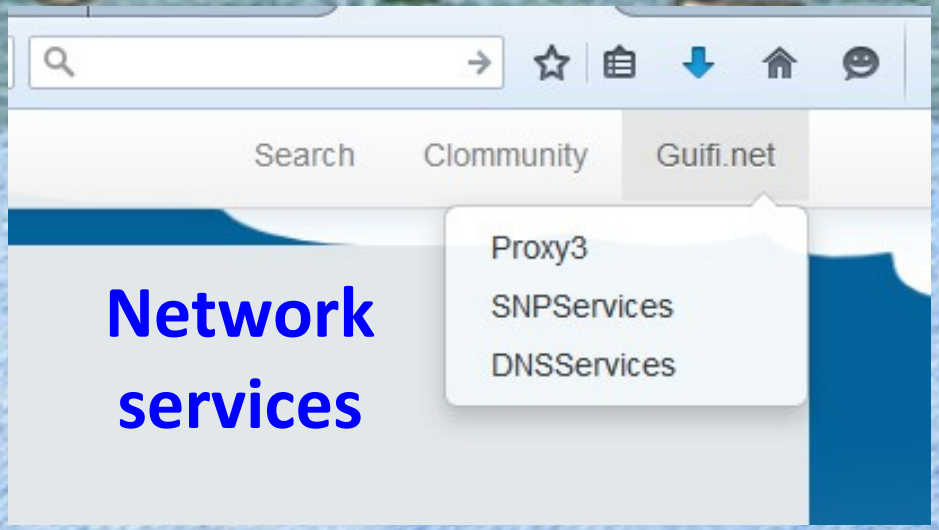
Description	Host	IP	Port	µcloud	Action
TincVPN_System	cloudytahoe1.guifi.local	10.228.207.53	665	demo	View
TincVPN_System	esquerda.guifi.local	10.138.33.130	665	demo	View
TincVPN_System	cloudyROSELK.guifi.local	10.139.40.146	665	production	View
TincVPN_System	cloudygarlanet8.guifi.local	10.139.40.69	665	demo	View
TincVPN_System	cloudy.guifi.local	10.255.14.239	665	demo	View
TincVPN_System	alix.guifi.local	10.95.0.23	665	demo	View
TincVPN_System	peerstreamer-1.guifi.local	10.139.40.48	665	production	View
TincVPN_System	debianjesuscuria.guifi.local	10.139.40.38	665	demo	View
TincVPN_System	raspberrypi.guifi.local	10.95.0.24	665	demo	View
TincVPN_System	cloudygarlanet4.guifi.local	10.139.40.76	665	demo	View
TincVPN_System	cloudygarlanet5.guifi.local	10.139.40.63	665	demo	View
TincVPN_System	cecilia.guifi.local	10.138.0.2	665	demo	View
TincVPN_System	cloudygarlanet9.guifi.local	10.139.40.70	665	demo	View
TincVPN_System	cloudymennan1.guifi.local	10.139.40.95	665	demo	View
TincVPN_System	peerstreamer-2.guifi.local	10.139.94.112	665	production	View
TincVPN_System	clonxu.guifi.local	10.139.40.130	665	demo	View
TincVPN_System	cloudygarlanet2.guifi.local	10.139.40.55	665	demo	View
TincVPN_System	cloudygarlanet1.guifi.local	10.139.40.54	665	demo	View
TincVPN_System	cloudygarlanet7.guifi.local	10.139.40.68	665	demo	View
TincVPN_System	cloudy-db-1.guifi.local	10.139.40.82	665	production	View
TincVPN_System	cloudytahoe2.guifi.local	10.228.207.64	665	demo	View
TincVPN_System	cloudy-db-3.guifi.local	10.139.40.89	665	production	View
TincVPN_System	CloudberryPi.guifi.local	10.139.40.113	665	demo	View
TincVPN_System	cloudygarlanet3.guifi.local	10.139.40.56	665	demo	View
TincVPN_System	cloudygarlanet6.guifi.local	10.139.40.67	665	demo	View
TincVPN_System	cloudygarlanet10.guifi.local	10.139.40.73	665	demo	View
TincVPN_System	cloudytest.guifi.local	10.139.40.28	665	demo	View
TincVPN_System	cloudev.guifi.local	10.139.40.27	665	demo	View
TincVPN_System	raspberrypi.guifi.local	10.138.27.194	665	production	View
TincVPN_System	cloudy-db-2.guifi.local	10.139.40.87	665	production	View
TincVPN_System	cloudydemo.guifi.local	10.139.40.92	665	demo	View
TincVPN_System	cloudymennan2.guifi.local	10.139.40.96	665	demo	View
TincVPN_System	HW-ErmitaBellvitge16-Cloudy.guifi.local	10.1.33.36	665	production	View
TincVPN_System	00000000016c_0076.guifi.local	10.139.40.112	665	demo	View

Scan quality of services

Community cloud services (Cloudy GUI)

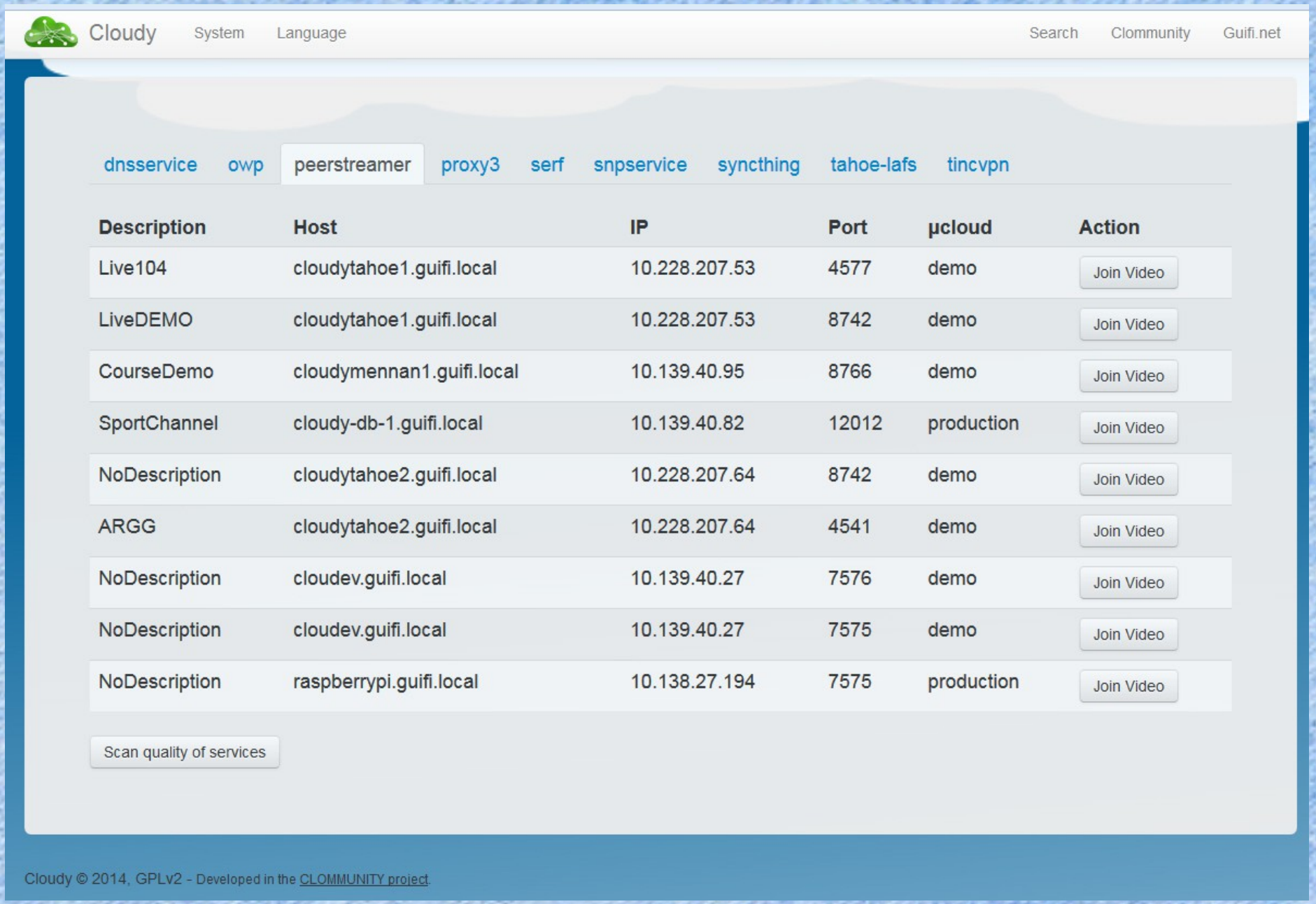




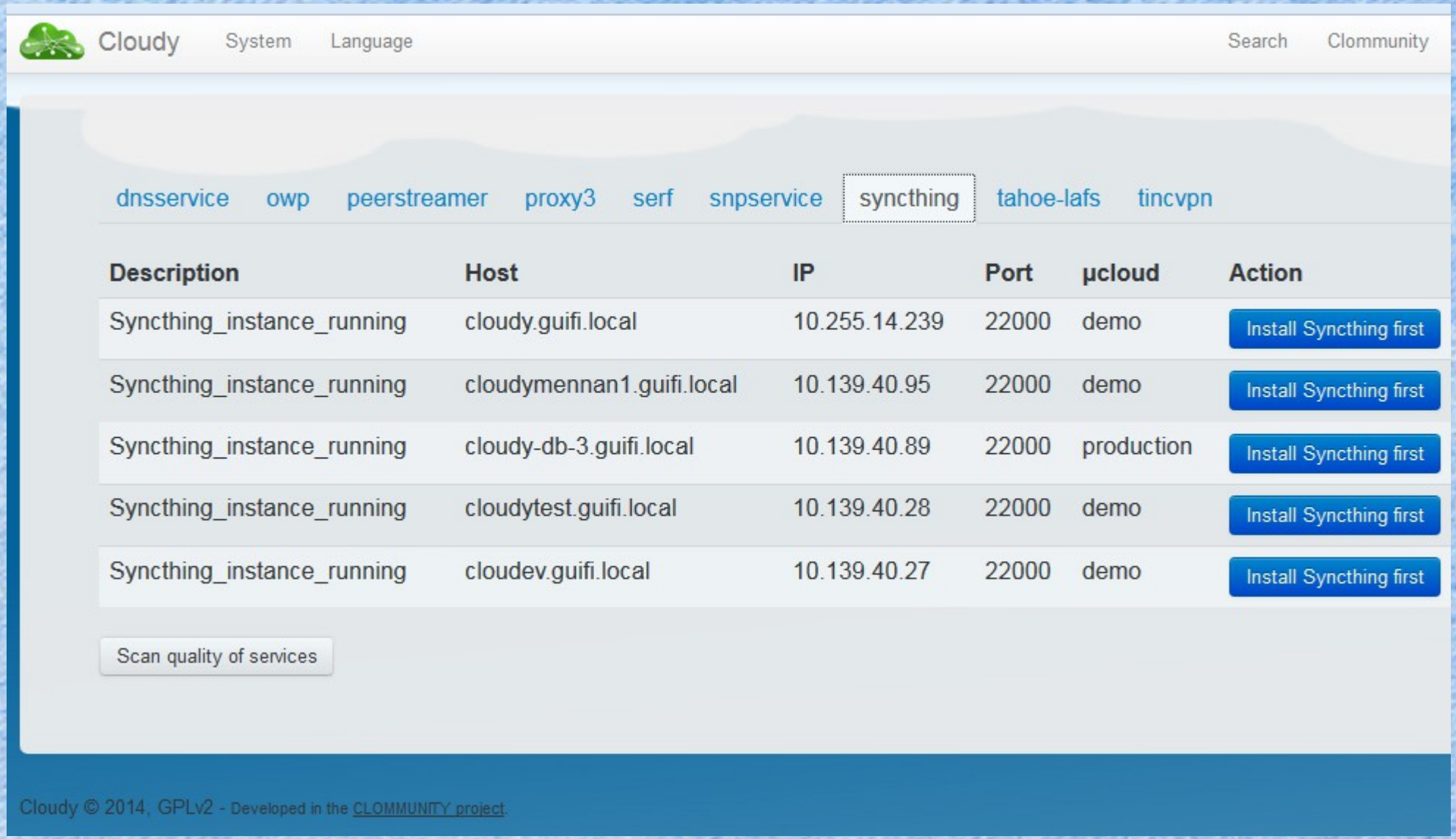


9 different service types deployed

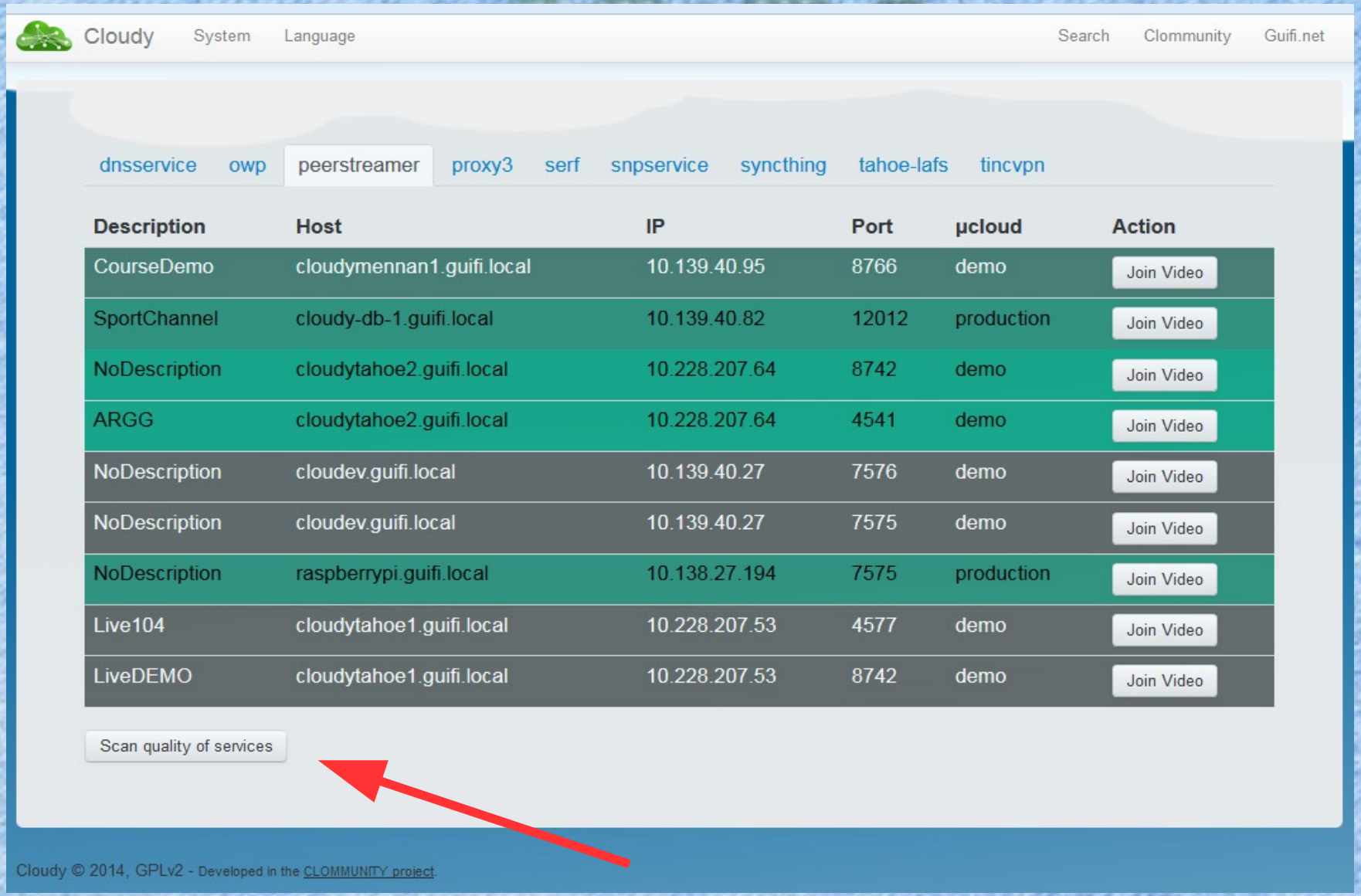
Several providers for the streaming service



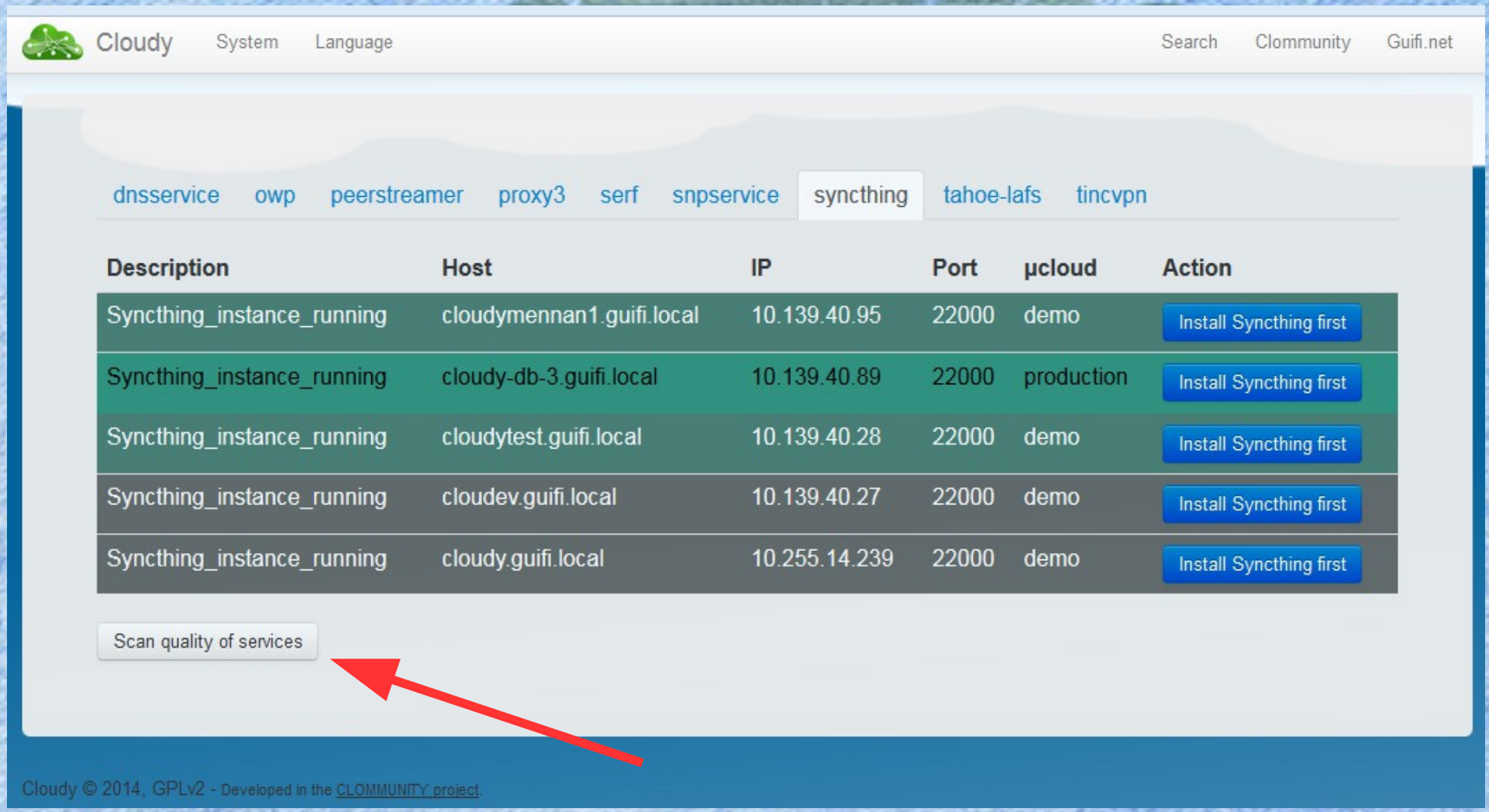
Several providers for the syncthing service



Scanning quality of the streaming service



Scanning quality of the syncthing service



Lessons learnt

Service quality for each user is **location-dependent.**

Centralized solution needs to be extended with network and infrastructure measurements to be efficient (or using decentralized approach)

For each service, **different service quality metrics** should be applied.

Limited expressivement of technical service quality metrics for socio-technical system.

Conclusions and Future Work

Community cloud deployment was shown, with several cloud services, multiple service providers.

Service selection supported, using service quality estimation.

Next step should involve **real users** to participate, understand **non-technical metrics** for service selection.

Permanent cloud services maintained by users.

Ultimately, create a community cloud service **ecosystem**.

A Community networking Cloud in a box

CLOMMUNITY

clommunity-project.eu

Thank you

Felix Freitag
felix@ac.upc.edu

o

CONNECTED COMMUNITIES
CONFINE

Clommunity

UPC
UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH