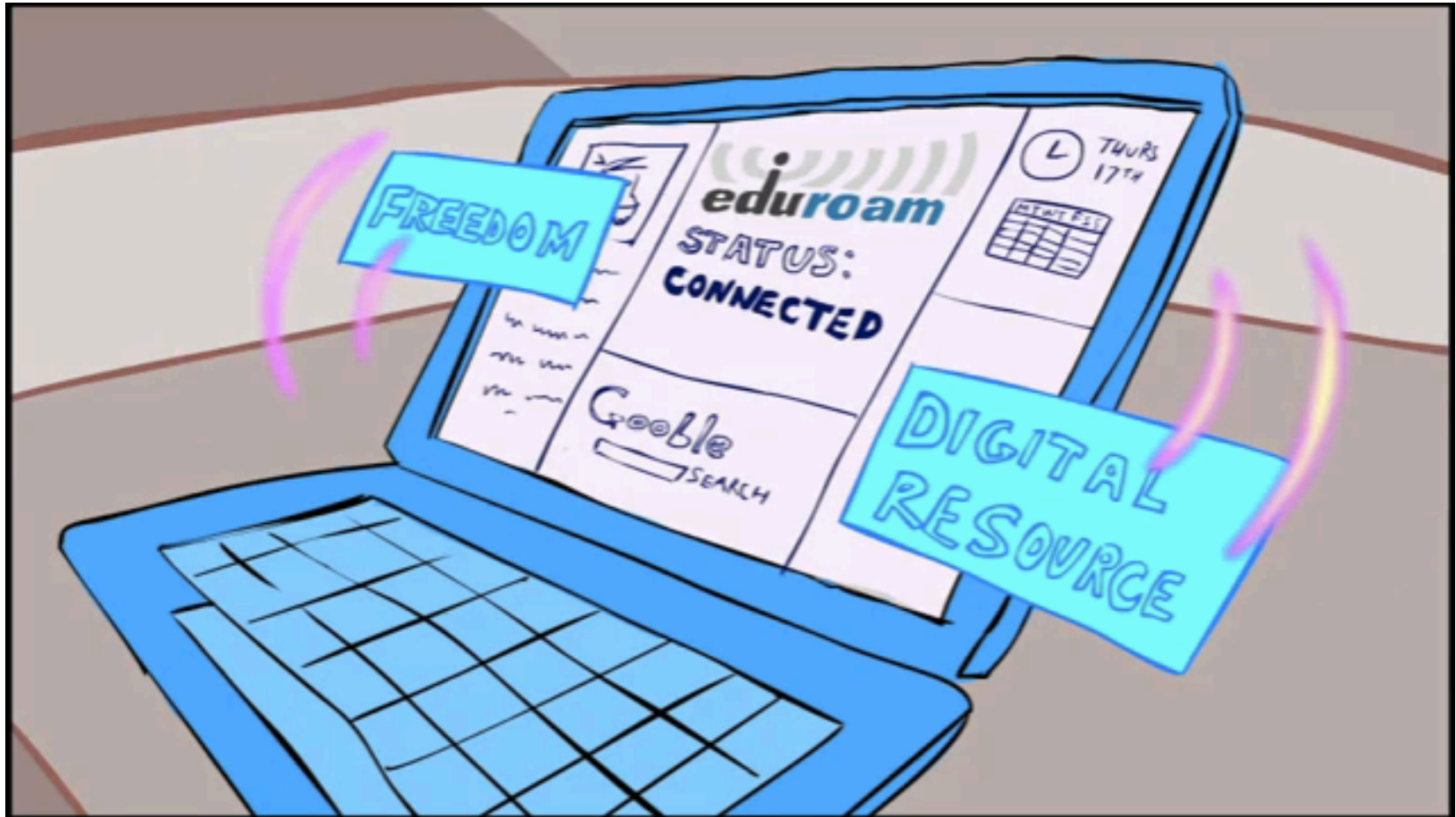




eduroam: Collaborative Internet Access

EIFL Webinar – Wednesday, 14 November 2012

Brook Schofield, TERENA
schofield@terena.org





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About me...

- **Brook Schofield**
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<http://terena.org/~schofield>



Australian living in The Netherlands
Grew up on the island state of Tasmania

Attended the EIFL GA in Belarus 2011



What is eduroam?



- **eduroam is a global wireless roaming network, based on:**
 - WPA2 & 802.1X (network access control)
 - RADIUS (infrastructure to transport credentials)
 - Trust fabric (RADIUS hierarchy and policy)
 - No web splash screen portal or shared passwords
- **Started in the TERENA Task Force “Mobility”**
- **eduroam = education roaming**

How it all started...



Subject: [mobility] proposal for inter NREN roaming
From: Klaas Wierenga <Klaas.Wierenga@surfnet.nl>
Date: Thu, 30 May 2002 12:46:43 +0200
To: mobility@terena.nl

Dear all,

As promised at the mobility workshop a proposal for an inter-NREN wireless LAN roaming test. Based on some investigation we have done in the Netherlands we propose to experiment with the 802.1x standard as that seems the most likely candidate for inter-NREN roaming since it gets a lot of industry attention and scales relatively easy.

I'm looking forward to hear your comments or better ideas.

Cheers,

Klaas

Two (2) options explored ...and rejected



- **Open WiFi + VPN**

- Route traffic back to your home organisation via VPN
 - Benefit that “internet” traffic was from the home institution
- Access Control is problematic
 - You don’t really know who is using it (just that they have a VPN)

- **Web Redirect**

- Popular at airports, cafés and hotels
- No “over the air” security

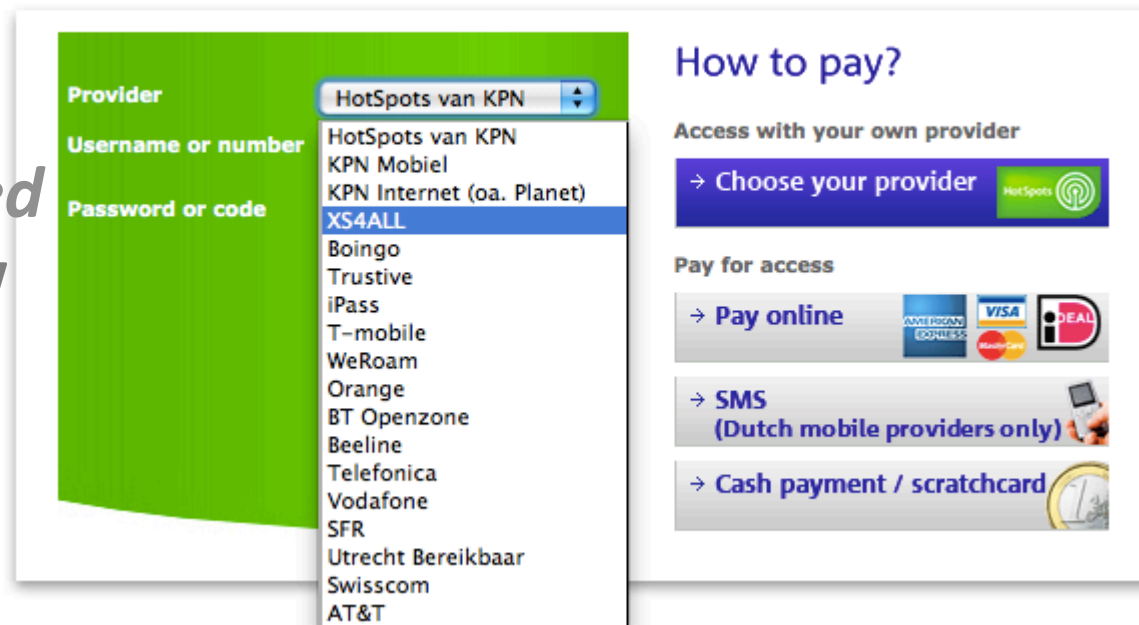
What is wrong with this page?

- **Airport Portal Pop-up**

- Who runs it?
- Can you trust it?
- What do they *need* (vs want) to know about you?

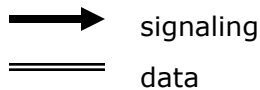
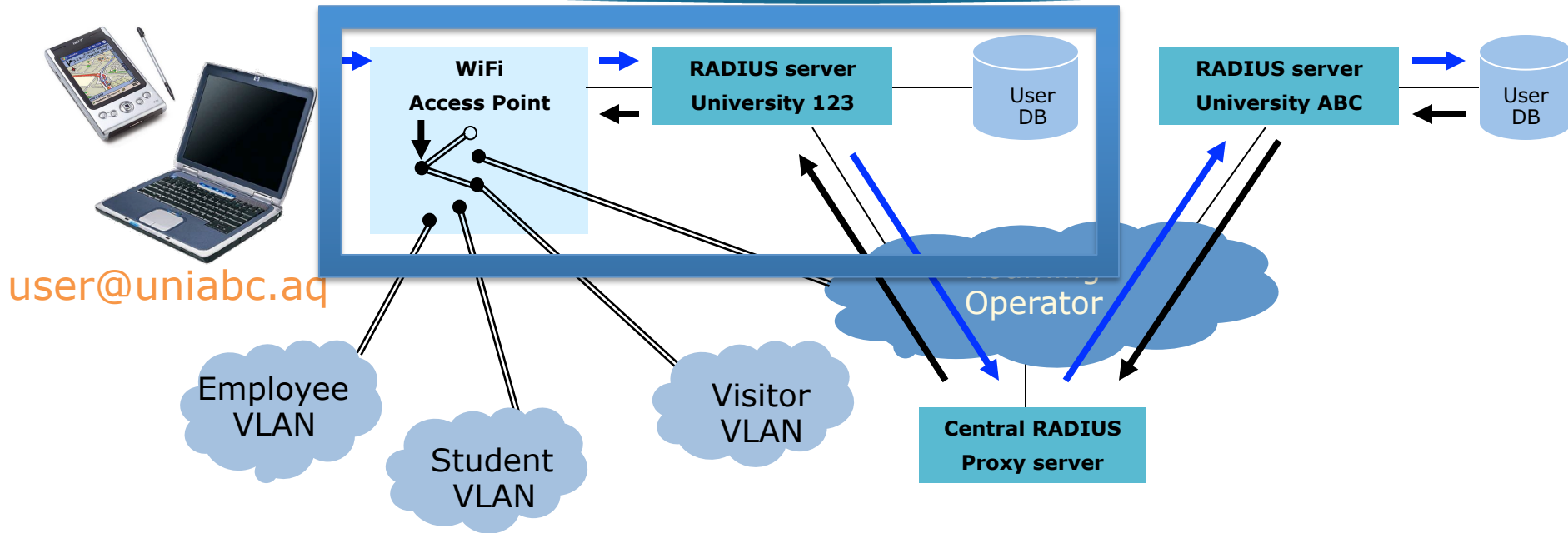
- **Is this run by a 16 year old on her laptop?**

Welcome at Schiphol airport



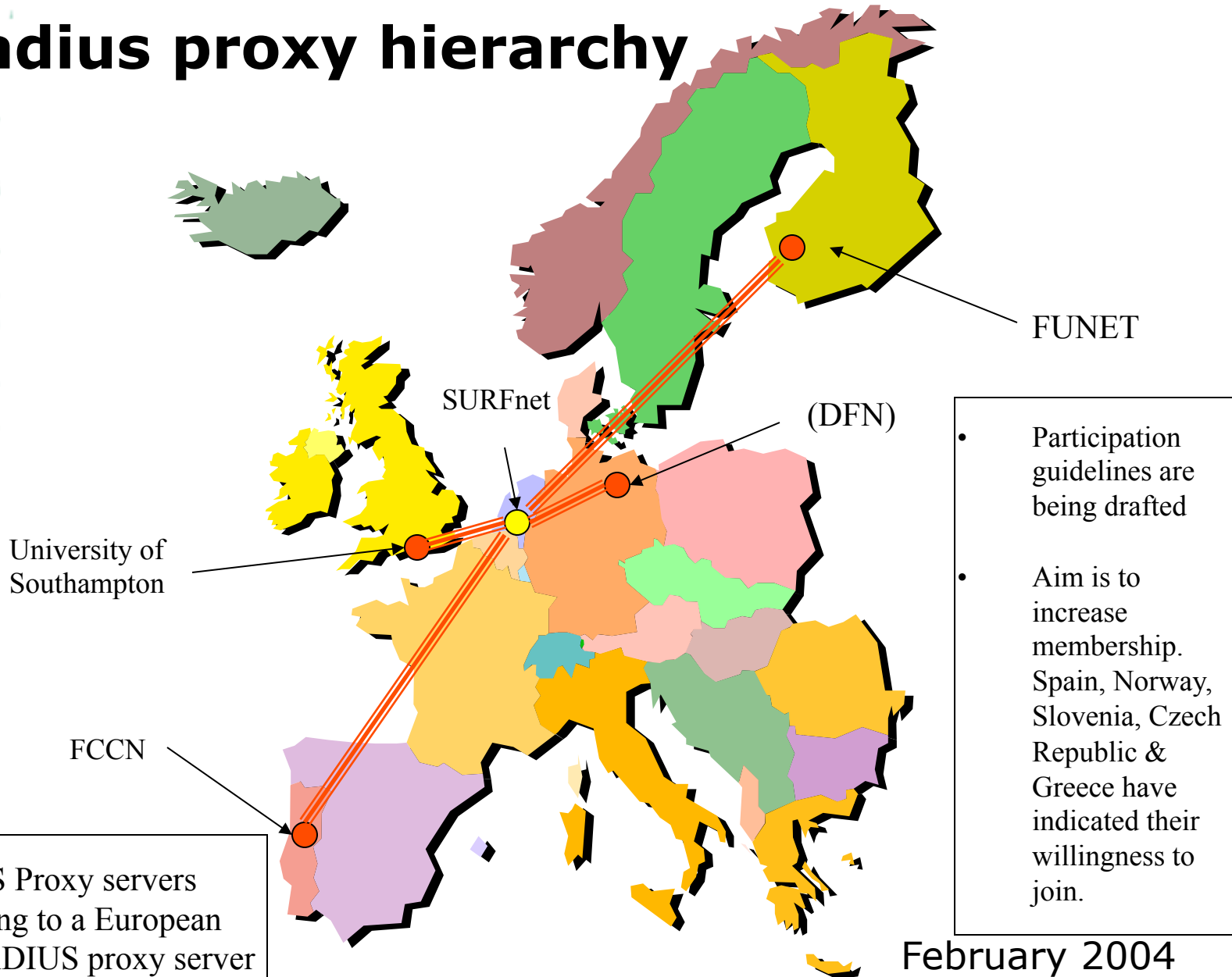
The screenshot shows a web portal for Schiphol airport. It features a green header with the text "Welcome at Schiphol airport". Below the header is a form with three fields: "Provider", "Username or number", and "Password or code". The "Provider" field is a dropdown menu currently showing "HotSpots van KPN". The dropdown list includes the following options: HotSpots van KPN, KPN Mobiel, KPN Internet (oa. Planet), XS4ALL, Boingo, Trustive, iPass, T-mobile, WeRoam, Orange, BT Openzone, Beeline, Telefonica, Vodafone, SFR, Utrecht Bereikbaar, Swisscom, and AT&T. To the right of the form is a section titled "How to pay?". Under this section, there are three options: "Access with your own provider" with a button "Choose your provider" and a "Hot Spots" icon; "Pay for access" with a button "Pay online" and logos for American Express, Visa, and Mastercard; and "SMS (Dutch mobile providers only)" with a button "SMS" and a mobile phone icon; and "Cash payment / scratchcard" with a button "Cash payment / scratchcard" and a scratchcard icon.

The solution: eduroam

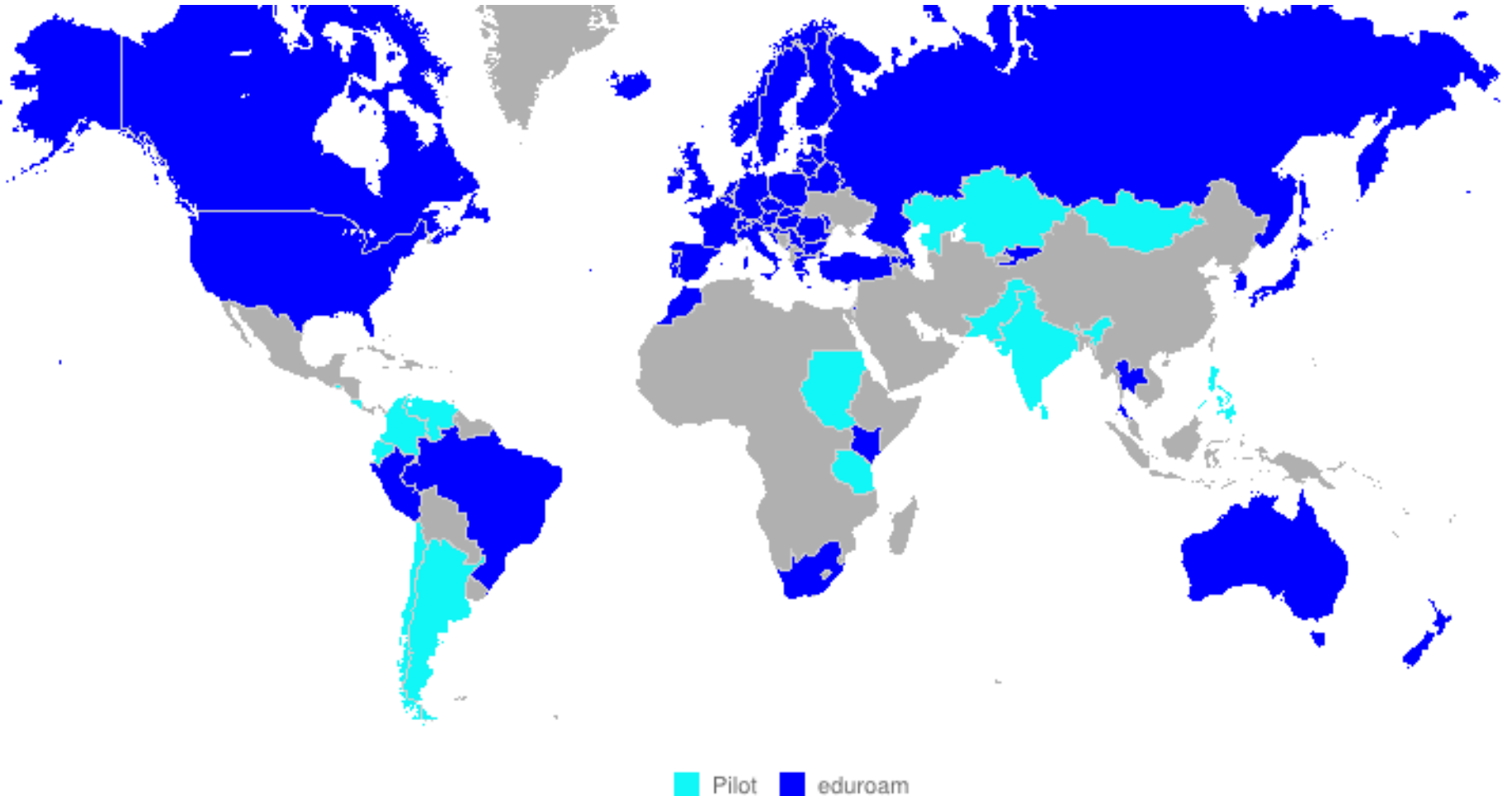


- Trust based on national policy
- Security based on 802.1X/RADIUS
- VLAN assignment to separate users

Radius proxy hierarchy



Where is eduroam?



Continual growth...



- **58 territories**
 - 43 territories in Europe
 - 8 territories in Asia (7 pilots in progress)
 - 2 territories in North America
 - 3 territories in Africa (1 pilot planned)
 - 2 territories in Latin America (7 pilots planned)
- **5000 locations, >1000 institutions**
- **WigleNet Crowd Sourced Access Point Stats**
 - May 2012 #27 – 0.108% - 70561
 - Sept 2012 #23 – 0.116% - 88135
 - Nov 2012 #22 – 0.112% - 97127
 - 3rd in list of operators behind BT & SFR

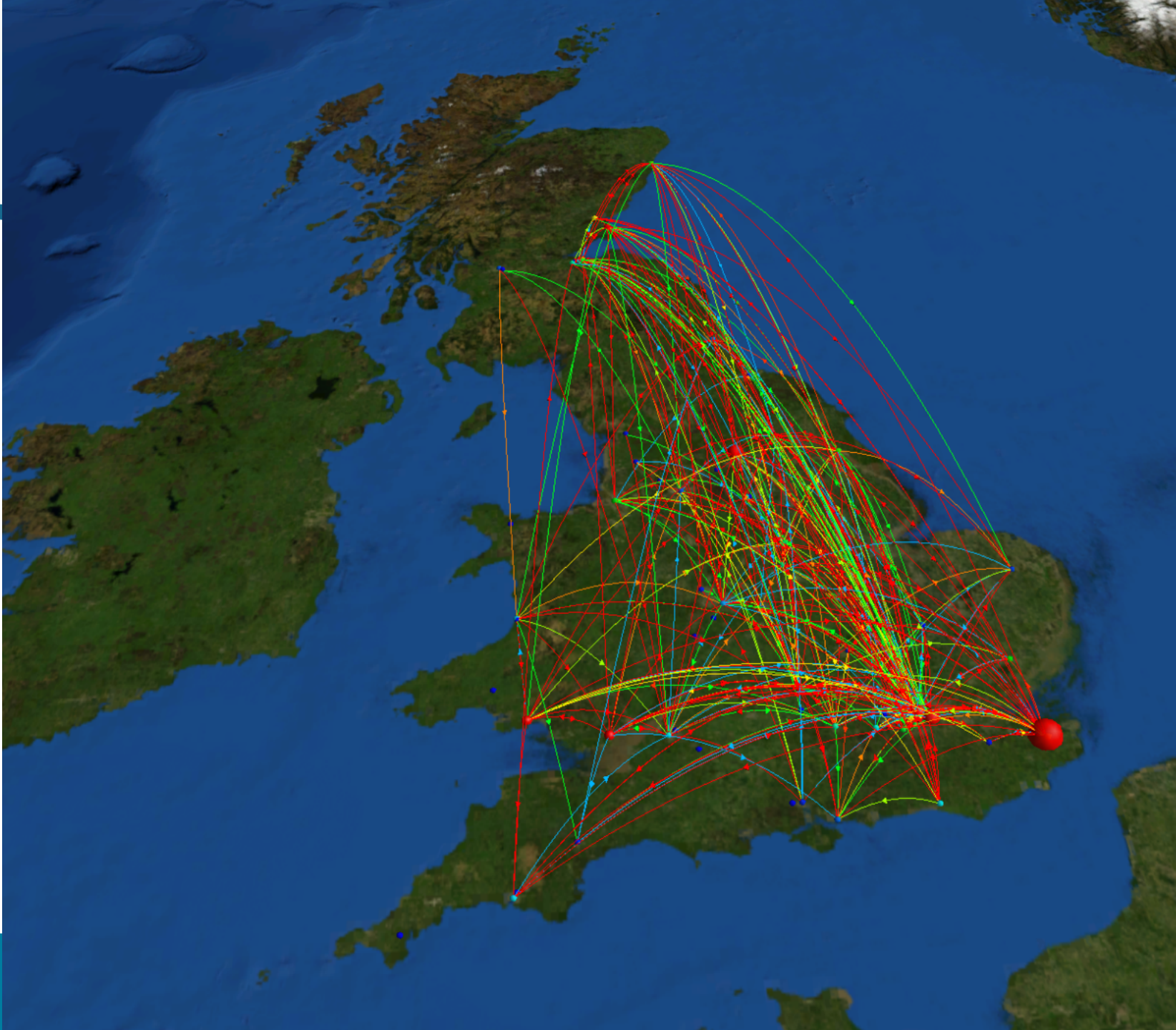
Growth requires Governance

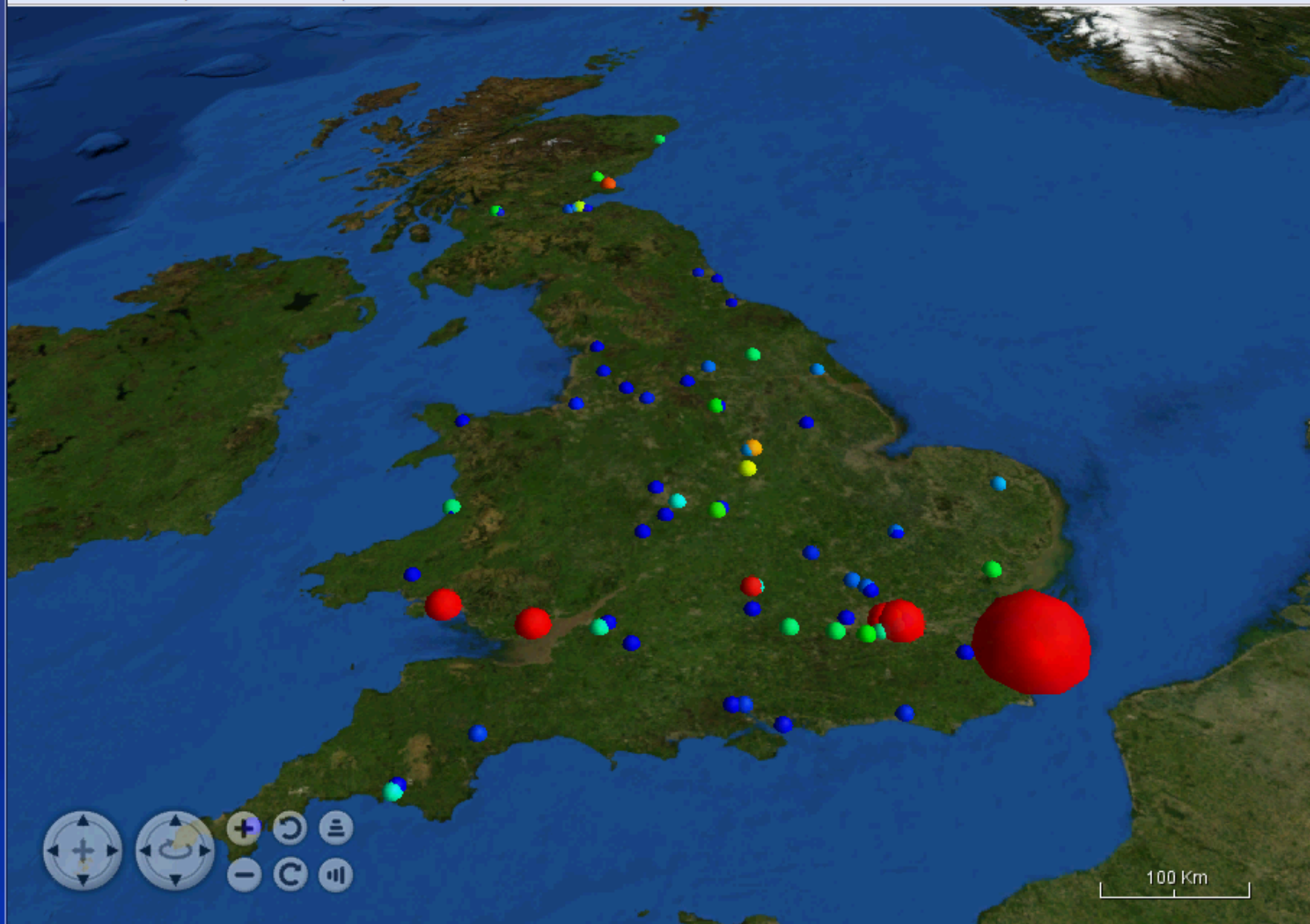


- **Global eduroam Governance Committee**
 - Created in 2011 to provide a “voice” for all regions
- **World-wide representation**
 - Europe (3), Asia (2), North America (2), *Latin America (2), Africa (2)*
 - Created the “Compliance Statement”
- **Signatories**
 - Europe (1), Asia (8), North America (2), Latin America (2), Africa (3)

- **Builds on your existing campus wifi**
 - Not new equipment – just new configuration
- **Use eduroam @ home**
 - Only 1 campus wifi network for all!
- **No guest accounts**
 - Helpdesk + identity verification is expensive
- **Improved support services in development**
 - Global improvements benefit your campus

- **I need to know who accesses my network**
 - Causes Loss of Control
- **Evil People Use eduroam**
 - You can still monitor usage and block individuals
- **Country X doesn't have eduroam**
 - 58 countries now – 7 more in Latin America thanks to ELCIRA in 18 months time
- **My staff and students don't go anywhere**
 - You'll be surprised what your students get up to!





Altitude 727 km

Lat 51.8858°

Lon 3.9444°

Elev -4 meters

Viewing: 28-9-2009 to 30-9-2009

Selected Node: none

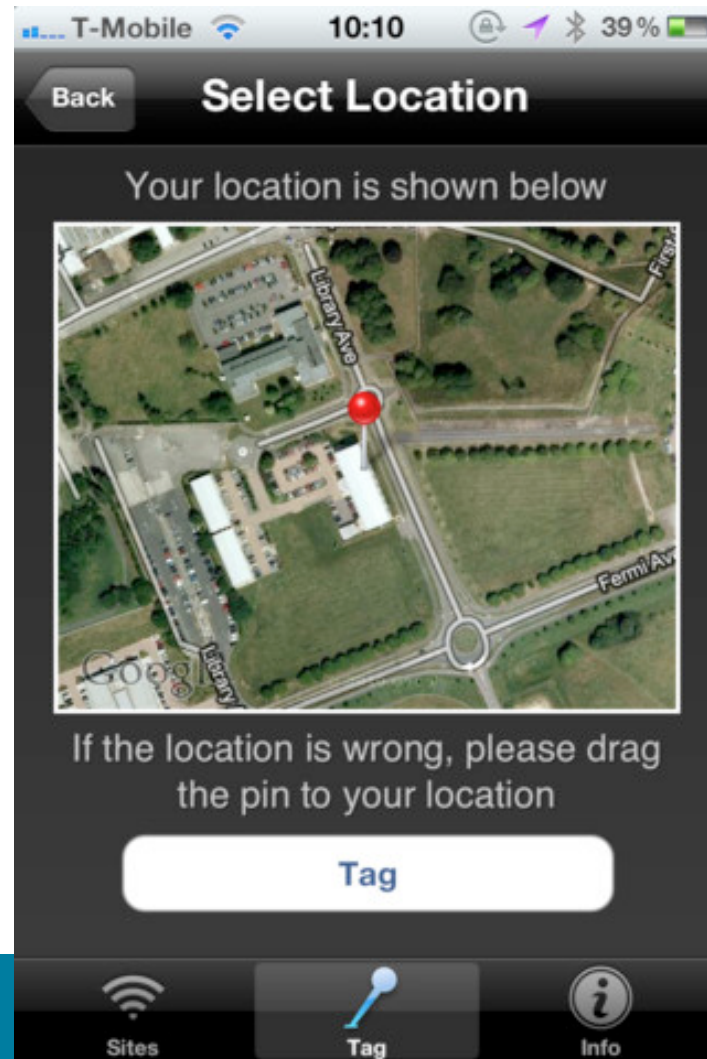
- **Ready for Hotspot 2.0, Next Generation Hotspot (NGH) and Wi-Fi Passpoint™**
 - Ready since 2003!
 - Support a wider range of roaming partners
 - Nothing is simpler than doing nothing!
- **Mobile/Cellular industry adopting this approach**



Ulf-Göran Nilsson @ugnilsson

eduroam + The Cloud = great success! 600,000 students and researchers in Sweden go mobile with eduroam and The Cloud
bit.ly/SAvA0s

eduroam Companion





- Also on Android
- Additional features
 - Heat maps
 - Twitter/Facebook

Why a configuration assistant tool?

- **Solve the user confusion problem**

- Institutional flexibility causes a documentation problem... ..installation is the hardest part.



UoB Library @uobllibrary

20h

iOS 6 devices unable to connect to UoB wifi after upgrade. Try using eduroam with un: regno@beds.ac.uk and normal pw.

tinyurl.com/bvep9wb



JULES @Jurasikk

26 Sep

has anyone even figured out #UI eduroam on mac's yet? I am still lost and confused....



Chris Painter @chrisfornow

26 Sep

Could anybody @CiCS tell me what CA certificate I need to specify when connecting to the eduroam WiFi network on a BlackBerry? #Confused!

Why a configuration assistant tool?

	Clear-text	NT hash (ntlm_auth)	MD5 hash	Salted MD5 hash	SHA1 hash	Salted SHA1 hash	Unix Crypt
PAP	✓	✓	✓	✓	✓	✓	✓
CHAP	✓	✗	✗	✗	✗	✗	✗
Digest	✓	✗	✗	✗	✗	✗	✗
MS-CHAP	✓	✓	✗	✗	✗	✗	✗
PEAP	✓	✓	✗	✗	✗	✗	✗
EAP-MSCHAPv2	✓	✓	✗	✗	✗	✗	✗
Cisco LEAP	✓	✓	✗	✗	✗	✗	✗
EAP-GTC	✓	✓	✓	✓	✓	✓	✓
EAP-MD5	✓	✗	✗	✗	✗	✗	✗
EAP-SIM	✓	✗	✗	✗	✗	✗	✗

- <http://deployingradius.com/documents/protocols/compatibility.html>

Why a configuration assistant tool?



- **Institution choose Authentication Type**
 - PEAP-MSCHAPv2 popular for Microsoft Platforms
 - TTLS-PAP popular for sites with encrypted LDAP
 - TTLS-* is only supported in Wi-Fi Passpoint
- **Multiple Device Platforms**
 - MacOS X and iOS devices (iPod, iPhone, iPad)
 - Microsoft Windows
 - Android Phone and Tablets
 - Other laptops/phones/tablets less popular (but need support) and new devices appear...





- **Pilots**

- Latin America: Argentina, Chile, Costa Rica, Venezuela
- Asia: India, Malaysia, Mongolia, Pakistan, Philippines, Singapore, Sri Lanka
- Africa: Tanzania

- **Interest**

- Latin America: Colombia, El Salvador, Ecuador
- Africa: Sudan, Cameroon, Zambia, Zimbabwe

Collaborations with EIFL

- **Zimbabwe** 
 - NUST are interested
- **Zambia** 
 - ZAMREN collaborating with Radboud Universiteit
- **Mongolia** 
 - Using Koha as an authentication source
- **Sudan** 
 - SudREN initial setup started



How do I join eduroam?



- **Set up a RADIUS server at your campus that...**
 - Authenticates your own users
 - FreeRADIUS <http://freeradius.org/>
 - Adds WPA2-Enterprise to your wireless network
 - Proxies guest users' requests to your roaming operator (and on to international infrastructure)
- **Connect to your federation RADIUS server managed by your Roaming Operator**
- **Promote eduroam to your users**

What if I don't have a Roaming Operator?



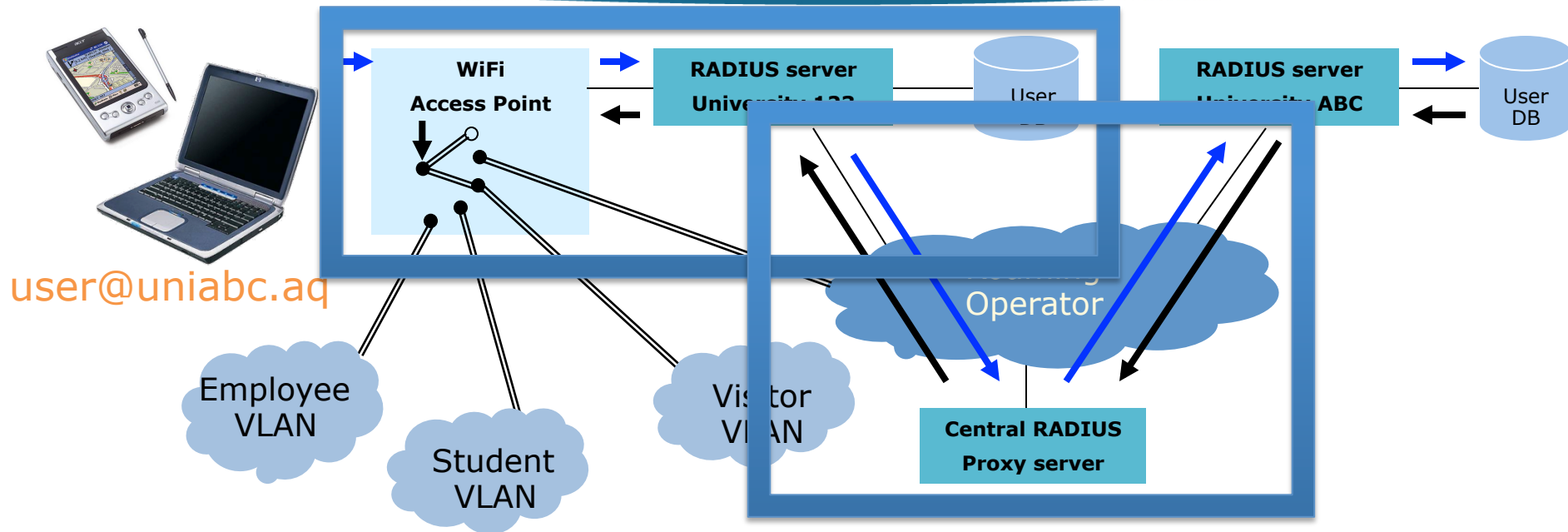
- **I don't have an NREN**

- A university or library can be the Roaming Operator
- USA, Hong Kong, Macau all started with a institution
- eduroam is a service above the network
- Underlying network can be an NREN, ADSL, Satellite or Cellular

- **Setup a Federation Level RADIUS for your ccTLD**

- RADIUS Proxy Server
 - RadSecProxy is ideal <http://software.uninett.no/radsecproxy/>
- Connect to eduroam Top-Level RADIUS

- **Promote eduroam to your peers**



user@uniabc.aq

- WiFi Access Points, a RADIUS Server and a user database for sites.
- RADIUS proxy for Federation Level RADIUS



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