

Swansea University

An aerial photograph of Swansea University. The university's main campus is a cluster of modern, multi-story buildings with various roof colors, situated on a green hillside. To the left, a wide, sandy beach curves along the edge of a large bay. The water in the bay is a deep blue, with visible tidal patterns. In the background, the city of Swansea is visible, extending to the seafront. The sky is clear and blue.

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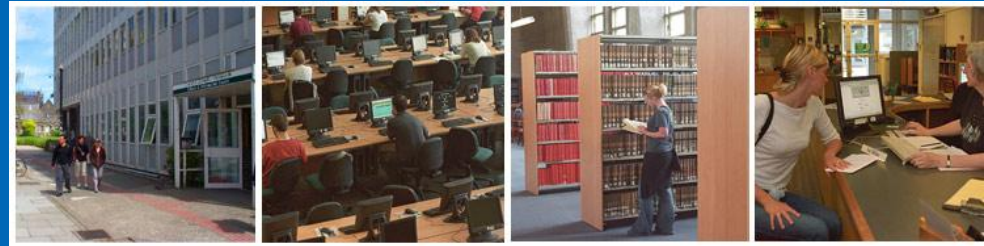
www.swan.ac.uk/lis

SWIS-Lite @ Swansea:

When eduroam doesn't fit

By Gareth Ayres

Gregynog Colloquium Conf 2011



Agenda

- 1.0 Wi-Fi, Eduroam, SU1X, and previous presentations
- 2.0 Eduroam is great but...
- 3.0 SWIS-Lite

1.1 Eduroam

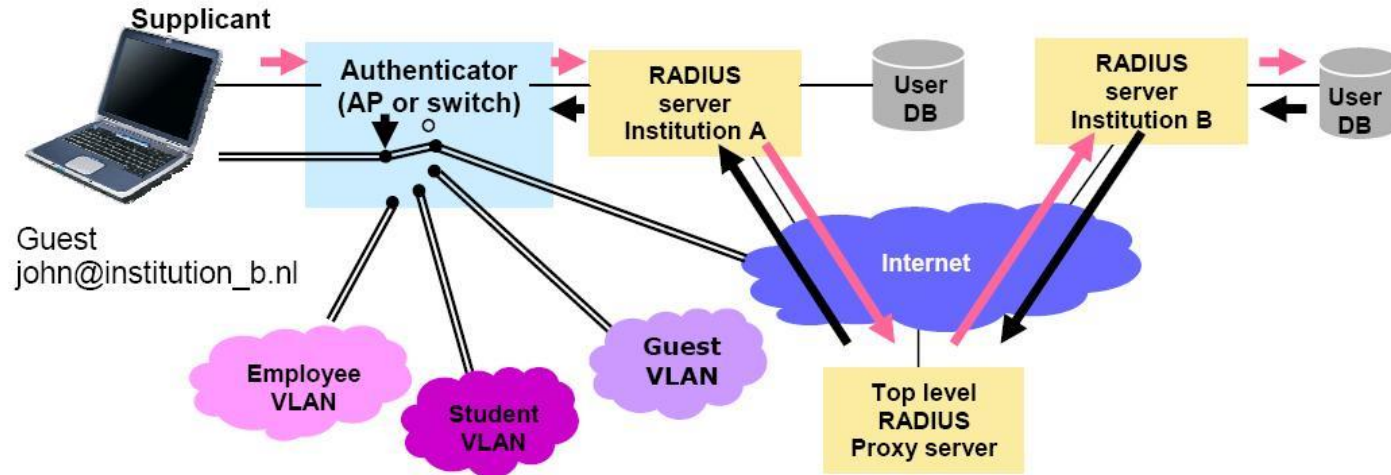


Deploying Eduroam : Last years presentation

*“eduroam (**education roaming**) is the secure, world-wide roaming access service developed for the international research and education community.”*

WWW.EDUROAM.ORG

1.2 Eduroam Broken Down: Example



→ signalling
== data

• USER@REALM

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1.3 Why Eduroam?

Advantages:

- Roaming
- Common platform, lots of support

Disadvantages:

- Infrastructure Complexity
- Deployment** Complexity

1.4 Where is Eduroam Available

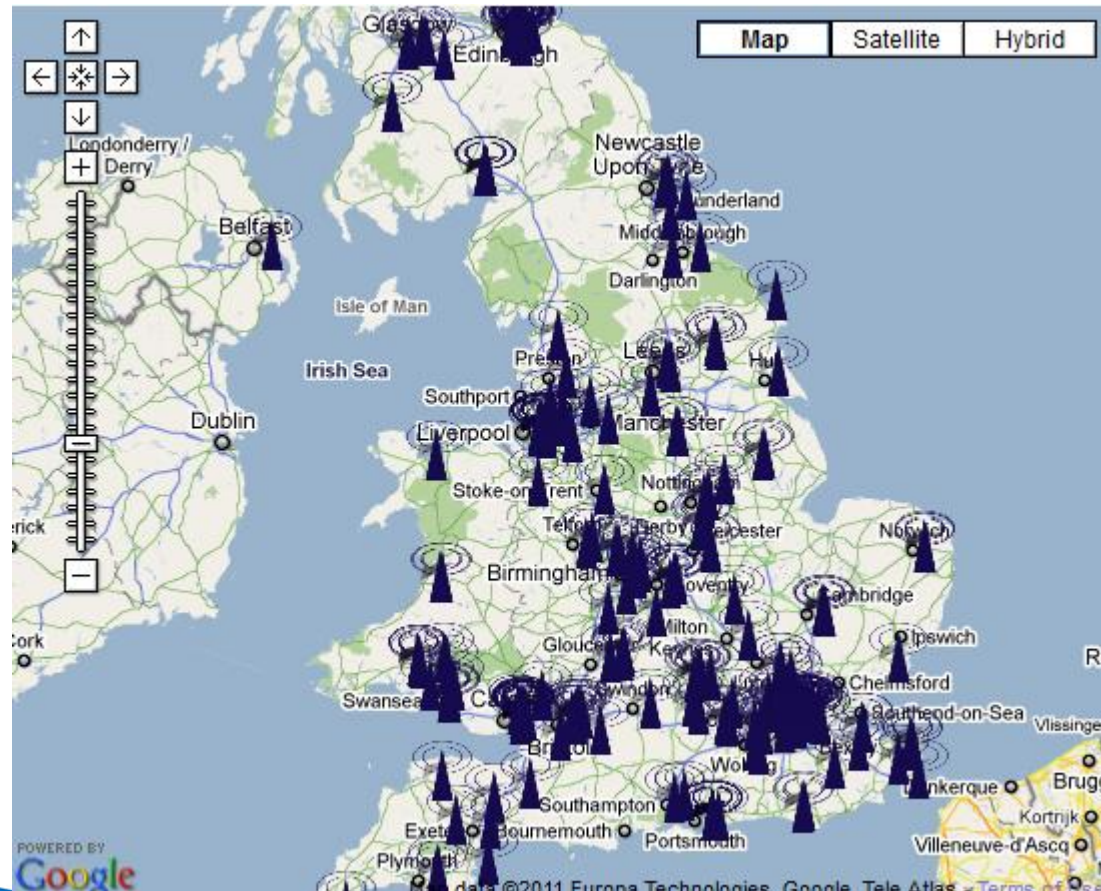
UK: 141

Europe

USA

ASIA/Australia

Canada



1.4 Deploying Eduroam

- SU1X – Windows setup tool
 - Automatically configures XP, Vista, 7
 - Installs certs and provides help
 - Deployed from setup SSID during registration
 - <http://su1x.sourceforge.net/>
 - By Swansea University (Janet UK funded)
 - Open Source
 - http://www.youtube.com/watch?v=SycvGhAF5xw&feature=player_embedded



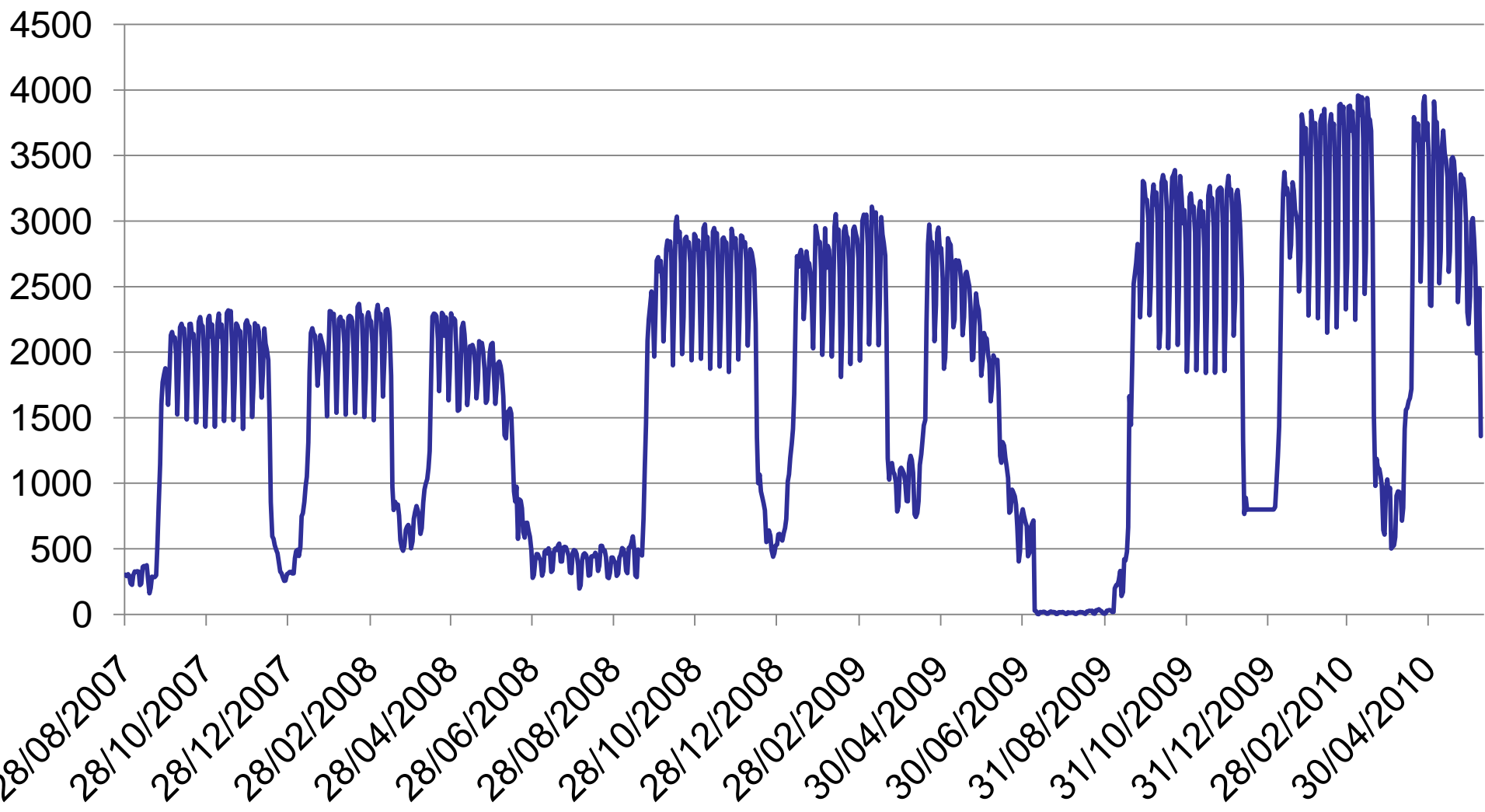
1.5 Eduroam at Swansea

2011

- Home and Visited site
- ~850 Lightweight access points
- 4 Cisco WiSM's
- ~5800 unique users / day



Unique Users 2007 - 2010



2.0 Eduroam is great but...

Eduroam is **complicated**:

WPA2-Enterprise, PEAP etc...

What about games consoles?

Student Survey demanded it!

Only support for basic home wireless such as **WPA2-PSK?!?!?**

Eduroam is a non-starter...

2.1 SWIS-Console 2010-2011



Web based registration through **eduroam-setup**

<http://swis.swan.ac.uk/console/>

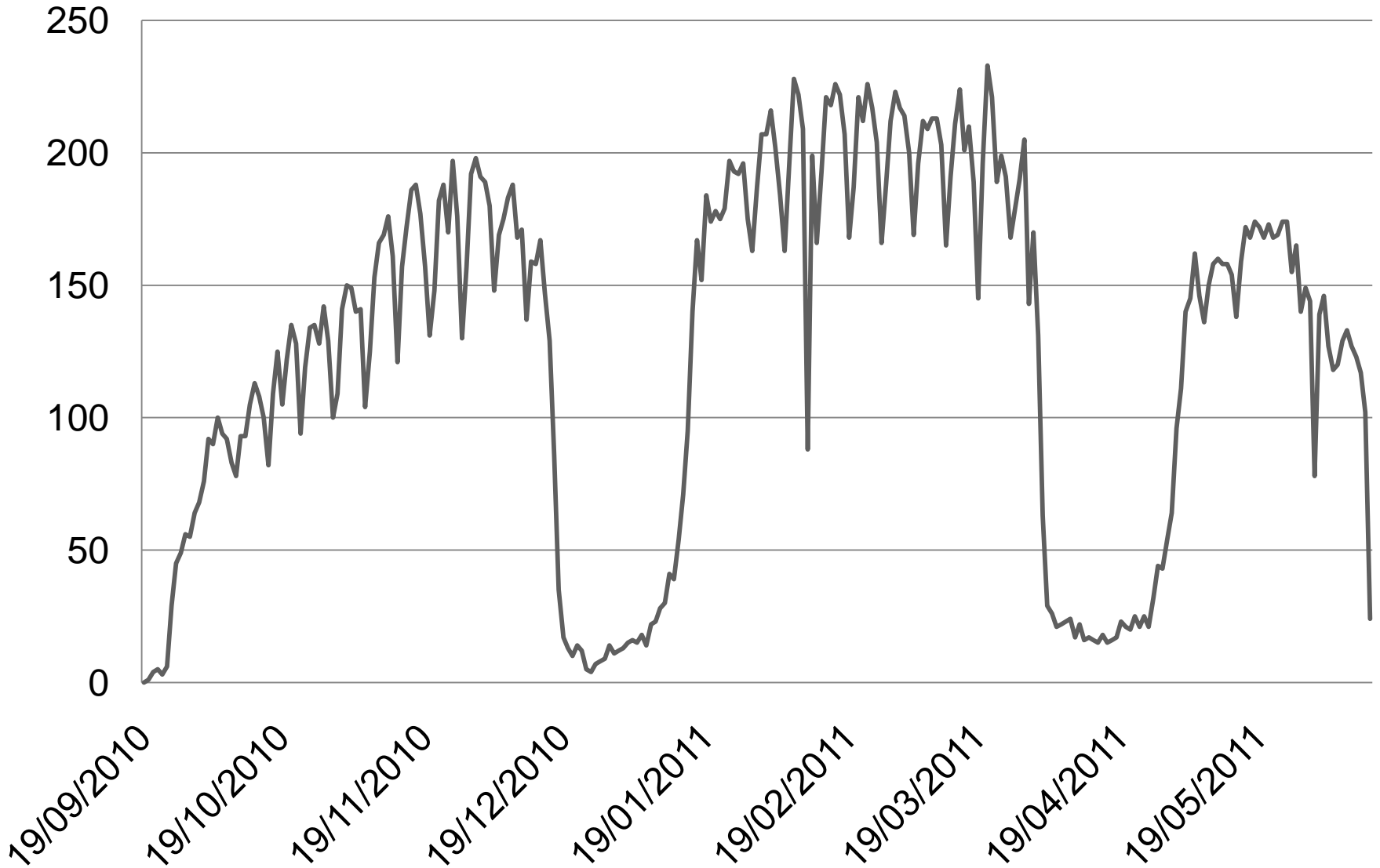
WPA2-PSK network broadcast in halls of residence only, that uses **mac-auth** over radius to ensure only registered devices can get into a VLAN.

2.2 SWIS-Console security

- WPA2-PSK encryption, but a not so secret key
- Registration form uses MAC OUI to check the device is a gaming device
- Users warned of risks

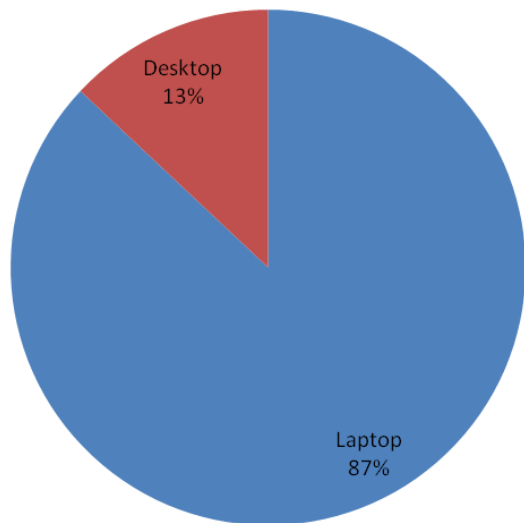
- Not ideal, but no alternative.

SWIS-Console Unique Users/Day 2010-11

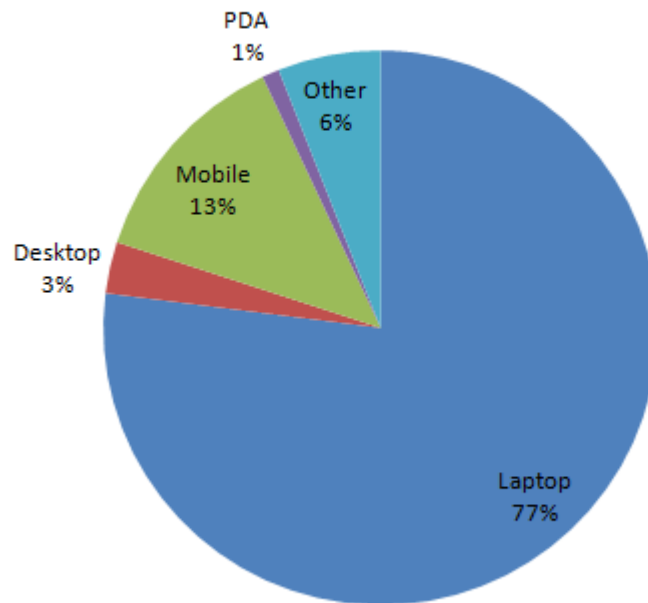


2.3 Device Types 2007 & 2009

Device Type

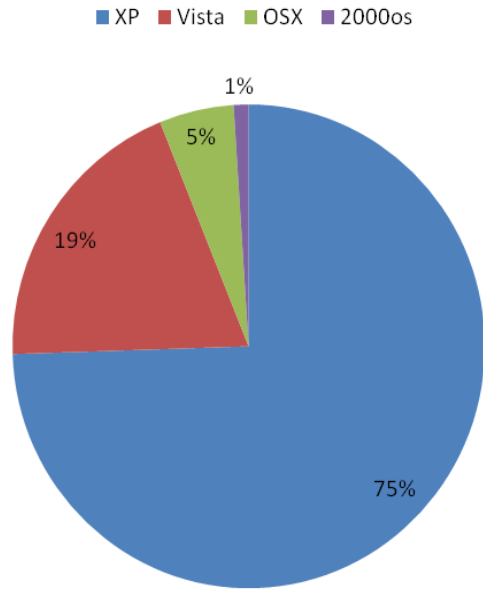


Device Types 2009

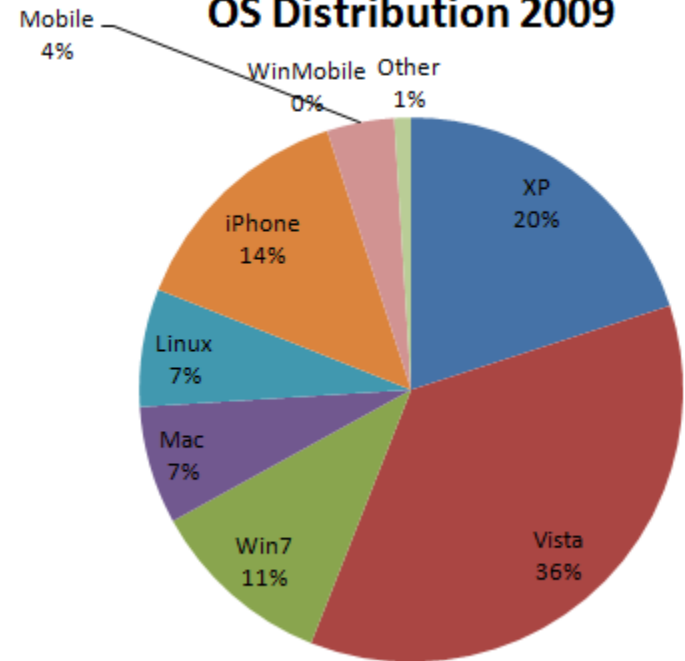


2.4 OS 2007 & 2009

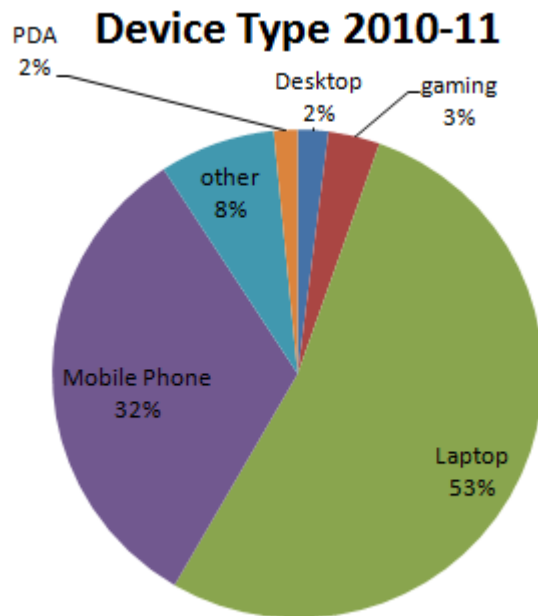
Operating Systems Distribution



OS Distribution 2009



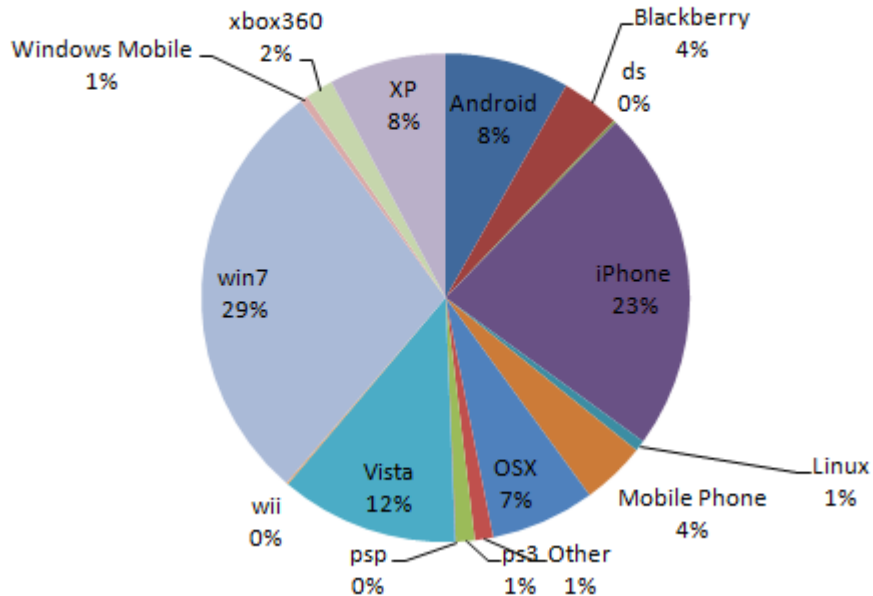
2.5 2010 – 2011 Device Types



Laptop	7494
Mobile Phone	4579
other	1085
gaming	484
Desktop	285
PDA	222

2.6 2010 – 2011 Device Types

OS Distribution 2010-11



win7	4047
iPhone	3217
Vista	1670
Android	1164
XP	1097
OSX	978
Mobile Phone	599
Blackberry	547
xbox360	259
ps3	176
Other	171
Linux	103
Windows Mobile	72
ds	24
wii	15
psp	8

2.7 So many device types!

Now getting wi-fi requests for:

- Kindles
- E-Book readers
- Digital Signage Stations
- Low-tech Mobiles
- Cheap Tablets / Netbooks
- On top of games consoles....



3.0 SWIS-Lite

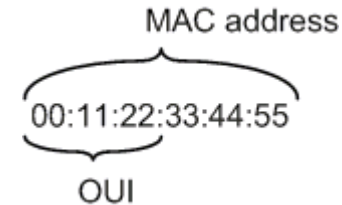
SWIS-Console network evolved into a campus wide **SWIS-Lite** wireless network to cater for everything **Eduroam** cant do!

- Web Based Registration
- Mac-Auth for VLAN assignment
- WPA2-PSK

3.1 Security?

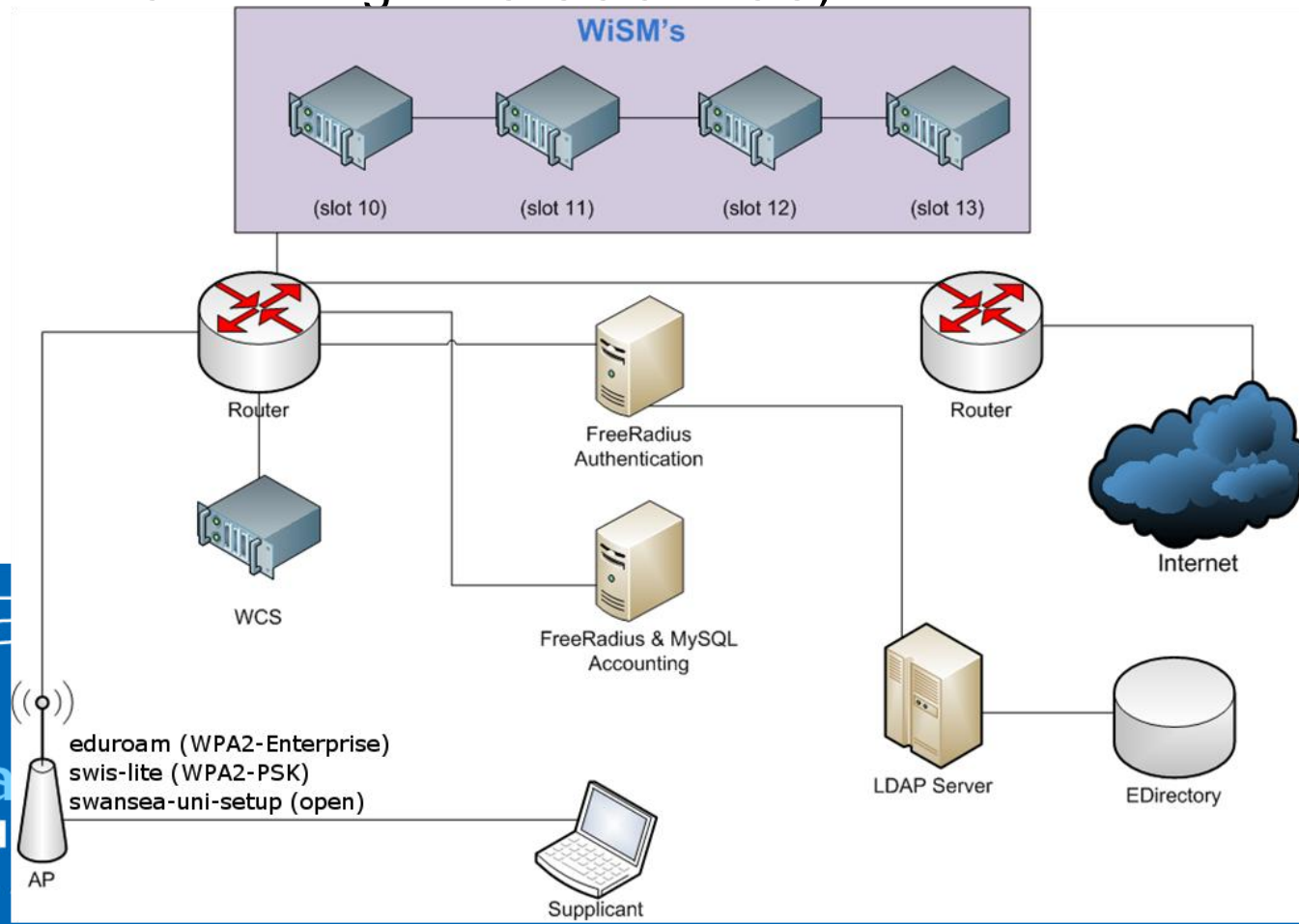
Web Registration:

- Checks the MAC OUI value.
 - Different VLANs for different device types
 - Different ports/ACL for different VLAN
 - Device Fingerprinting with NMAP
-
- Not impervious. MAC's can be faked.



3.2 MAC-Auth and Radius

FreeRadius used to handle AAA for SWIS-Lite.
(Called MAC-Filtering on CISCO WCS)



Thank You – Any Questions?

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Links:

<http://www.eduroam.org/>

<http://www.ja.net/services/authentication-and-authorisation/janet-roaming.html>

<https://github.com/GarethAyres/SU1X>

<https://code.google.com/p/su1x-droid/>