

Guest Wi-Fi at the University of Waterloo

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Information Systems and Technology



Current Methods for Guest Wi-Fi access

SSID	Requirements	Notes	Locations
Eduroam	<ul style="list-style-type: none"> (UW) Valid WatIAM account (Visitor) Valid account at home institution Net-ID account (uw sponsored) 	<ul style="list-style-type: none"> Primary SSID for campus No inter-client communication Eduroam CAT tool for configuration 	All UW campuses
Uw-guest	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Captive portal SSID web traffic only No inter-client communication 	Library
uw-event	<ul style="list-style-type: none"> Pre-shared key (PSK) 	<ul style="list-style-type: none"> Large event Wi-Fi access Inter-client communication 	Event location
CECA	<ul style="list-style-type: none"> Pre-shared key (PSK) 	<ul style="list-style-type: none"> Internet access for employers No inter-client communication 	TC
Uw-wifi-setup-no-encryption	<ul style="list-style-type: none"> Event password Professional development course registration 	<ul style="list-style-type: none"> Captive portal SSID No inter-client communication 	All UW campuses

Current Methods for Guest Wi-Fi access continued

- Wi-Fi event registration portal –Requested via RT.
Attendees must
 1. Connect to the captive portal SSID ‘uw-wifi-setup-no-encryption’
 2. Choose the attending an event link
 3. Fill in their details: first name, last name, email, event password
 4. Provide 10 minutes of full internet access to verify email address
 5. mac address authenticated until the end of the event

Current Methods for Guest Wi-Fi access continued

- Wi-Fi portal for the center for extended learning
 1. Connect to the captive portal SSID 'uw-wifi-setup-no-encryption'
 2. Choose the attending a Professional Development course link
 3. Fill in the email address
 4. The device is now mac address authenticated until the end of the event.

Notes on current methods

- Prefer captive portal over PSK
 - Captive portal method associates email address to users
 - Needed for notice and notice
- Open networks do not encrypt the traffic
 - Eduroam/PSK traffic encrypted Wi-Fi is from AP to controller only
 - Traffic from controller to everything else not encrypted
 - From AP to internet, traffic security depends on application (eg. HTTPS)

Ideas to make things easier

- Provide access to Wi-Fi event registration tool to all faculty I.T.
- Make the Guest access methods and how to request them more well known
- Simplify the event access for users by requiring only an email address (no password).
- Decommission captive portal entirely, provide a free to access open SSID
 - Requires a risk assessment to be completed
 - May not be feasible

Too many SSID's is a bad thing

- <http://www.revolutionwifi.net/revolutionwifi/p/ssid-overhead-calculator.html>

VARIABLES:	
Beacon Data Rate (Mbps)	802.11b 1 Mbps
Beacon Frame Size (Byt)	380
Beacon Interval (ms)	102.4

ASSUMPTIONS:
802.11b Long Preamble used for 1 Mbps; Short Preamble used for 2, 5.5, 11 Mb
802.11g short slot time is assumed, with no 802.11b clients within range
WMM is enabled and beacons are transmitted using Best Effort AC

Amount of Overhead:		0-10% Low	10-20% Medium	20-50% High	>50% Very High	
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Number of APs on Channel*	Number of SSIDs									
	1	2	3	4	5	6	7	8	9	10
1	3.22%	6.45%	9.67%	12.90%	16.12%	19.35%	22.57%	25.80%	29.02%	32.25%
2	6.45%	12.90%	19.35%	25.80%	32.25%	38.70%	45.14%	51.59%	58.04%	64.49%
3	9.67%	19.35%	29.02%	38.70%	48.37%	58.04%	67.72%	77.39%	87.06%	96.74%
4	12.90%	25.80%	38.70%	51.59%	64.49%	77.39%	90.29%	100.00%	100.00%	100.00%
5	16.12%	32.25%	48.37%	64.49%	80.62%	96.74%	100.00%	100.00%	100.00%	100.00%
6	19.35%	38.70%	58.04%	77.39%	96.74%	100.00%	100.00%	100.00%	100.00%	100.00%
7	22.57%	45.14%	67.72%	90.29%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
8	25.80%	51.59%	77.39%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
9	29.02%	58.04%	87.06%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
10	32.25%	64.49%	96.74%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11	35.47%	70.94%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
12	38.70%	77.39%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
13	41.92%	83.84%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
14	45.14%	90.29%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
15	48.37%	96.74%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
16	51.59%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

1 AP with 3 SSID's uses almost 10% of airtime for beacons

A second AP if in range puts this up to nearly 20% of airtime for beacons

Commercial alternatives

- Aruba Clearpass -
https://www.arubanetworks.com/assets/ds/DS_ClearPass_Guest.pdf
- Price is not insignificant
- Requires documented requirements

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