



## Welcome to OpenNet

Ubiquiti Routerstation Challenge / Supporting Documentation

**Last Updated: 31 / August / 2009**

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## What is OpenNet?

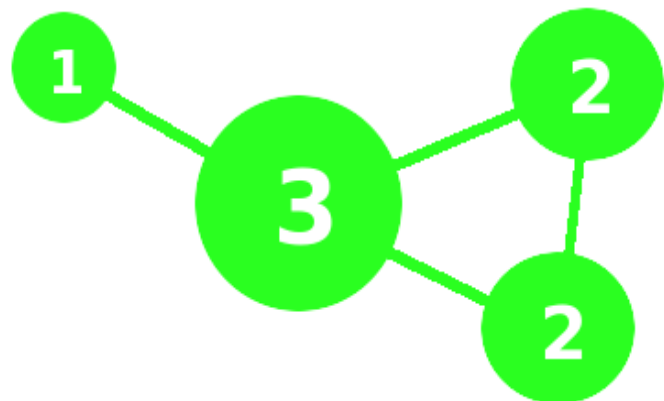
OpenNet pairs advanced wireless routing firmware with a centrally managed web based "dashboard" to create wide coverage, highly scalable wireless networks with very fast deployment times and low capital investment costs.

The "OpenNet" dashboard makes it simple to monitor network usage, restrict or allow WiFi access to Individual users and configure all aspects of one, or more, networks of Ubiquiti / OpenNet access point nodes.

In addition to straight-forward public WiFi provision OpenNet supports undesirable content filtering by category and paid "Hotspot" access with turn-key voucher and credit / debit card payment gateways.

OpenNet has already been used by hundreds of users and perfect applications are high density apartment and housing developments, educational establishments, business parks, hotels and holiday parks and villages. See our case studies section for details on some of the real life installations.

At the heart of the OpenNet network is advanced MESH based network routing. This extends the WiFi Internet across the network of Ubiquiti/ OpenNet access point nodes and uses intelligent route selection to optimise speed and capacity while ensuring an always-on fault tolerant and self-healing network infrastructure.





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## Features

- Fast and simple network deployment
- Faster return of investment over other WiFi and/or wired networking technologies
- Simple network monitoring, management and usage reporting accessible anywhere and at any time with the centralised web based dashboard
- Highly scalable – just add more Ubiquiti / OpenNet access point nodes
- Resilient auto-healing and auto-configuring multi-path network routing
- Integrated Hotspot, voucher and credit/debit card billing
- Configurable website restrictions based on more than 60 distinct content categories (e.g. dating, social network, aggressive and anti-social websites).

## Compatibility

OpenNet has been designed to operate exclusively with Ubiquiti hardware.

WORKING	Ubiquiti Nanostation 2
WORKING	Ubiquiti Bullet 2 (and Bullet 2 HP)
WORKING	Ubiquiti Routerstation *

\* Note: OpenNet is compatible with Ubiquiti Routerstation when installed with a compatible Atheros chipset based radio card such as the Ubiquiti XR2



## Breakdown of features

### MESH based networking

OpenNet uses advanced MESH based networking which allows individual access point nodes to route traffic via neighbouring nodes when they are not directly connected to an Internet supply themselves.

Changes within the networking topology will trigger routing updates near instantaneously with no noticeable effect to users.

Routing is entirely dynamic with no administration required ever.

By introducing two, or more, access point nodes with direct Internet connectivity a level of resilience with load balancing and fault tolerance is instantly achieved.

Link quality between individual nodes and their neighbours is constantly monitored to achieve real time interference detection and avoidance.





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## Easy network management & monitoring

The OpenNet web based "dashboard" provides a central location to configure one, or more, Ubiquiti / OpenNet networks.

Because the dashboard is hosted in Ireland's largest data centre it's available to you, where-ever you are and when-ever you want to see how your network is performing.



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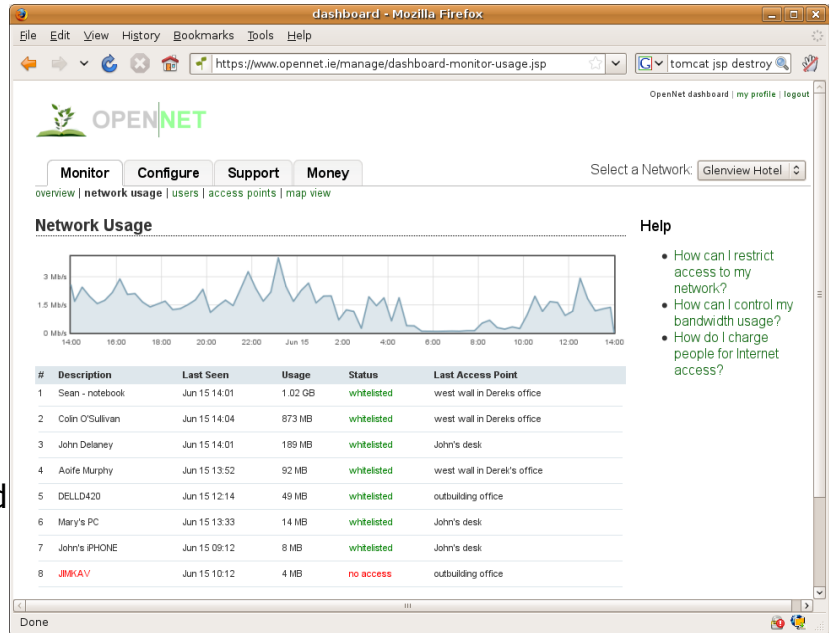
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Simple menus and easy to read graphs provide a clear picture on how users are using the network.

With the Configure menus it's also easy to set up a network for free public access or you can restrict access to selected users or you can configure a pay-for-use Internet Hotspot and earn income on your network.



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## Hotspot & pay-for-use Internet

Two web-pages, and a pre-paid voucher entry or a credit / debit card transaction, is all that stands between a customer and Internet access.

The page below shows the customised splash page, with multi-language translations, as currently in-use with the Ubiquiti / OpenNet powered "holiday broadband" WiFi service operating in a number of camping and holiday sites in the south-east of Ireland.

Holiday Broadband: high speed, low contention, here, now

15th Jun 2009

**Vouchers**

**Multi-lingual**

**Credit & Debit cards**

**24hours** 24 hours access for 4 euro  
Get access to the Internet for 24 hours.  
[Click here to buy now...](#)

**7days** 7 days access for 15 euro  
Get access to the Internet for 7 days.  
[Click here to buy now...](#)

**1month** 1 months access for 40 euro  
Get access to the Internet for 1 month.  
[Click here to buy now...](#)

**\*\*\* Our refund policy**  
We only want to provide you with a great service. If you are unhappy with our service, and have paid us, we will refund you the payment you have made. You must lodge any complaints within 7 days of purchase along with details of your problem (to contact us see our contact us page). We highlight this in relation to your EU consumer rights. Refunds are offered at the discretion of the management.

Terms and Conditions | Privacy Policy  
© Copyright 06-09 Camsore Broadband (a private partnership)

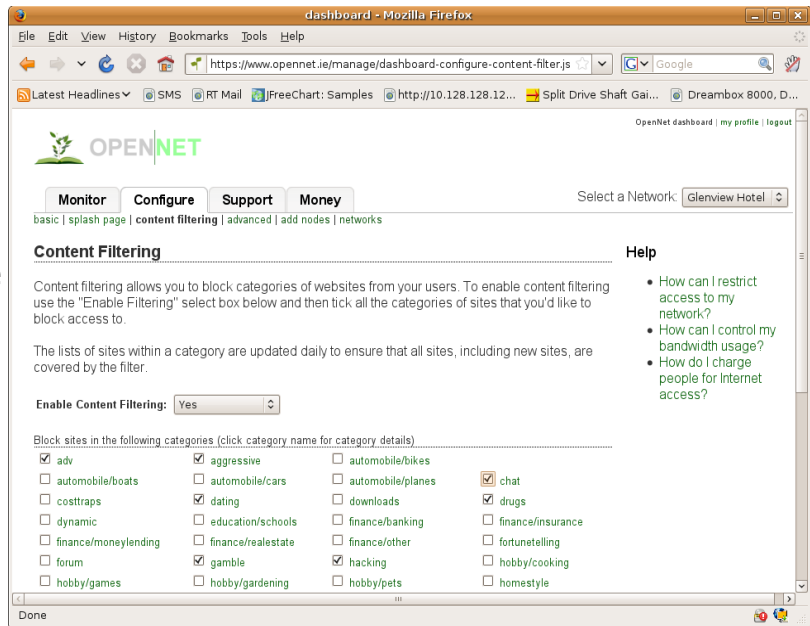




## Undesirable content filtering

Content Filtering allows you to block categories of websites from your users.

There are currently 65 categories of website and the list of sites within the categories are updated daily. This number of categories makes it simple to restrict sets of undesirable sites for your users.



In addition to site restricting the access logging shows you which users have attempted, and failed, to access restricted sites.



## Getting started

### Three Step Overview

- Install firmware onto Ubiquiti unit(s)
- Create an account on [www.opennet.ie](http://www.opennet.ie)
- Add your Ubiquiti unit(s) to your OpenNet account

### Detailed Instructions

#### Install OpenNet firmware overview

Both the Ubiquiti Bullet2 and Nanostation2 units can be firmware updated via the web interface or via TFTP. The Routerstation units can ONLY be firmware updated via TFTP as they are not pre-loaded with AIR O/S which provides the web interface.

#### Option A - Firmware updating via the web interface

This option assumes that you have not modified the default factory pre-set settings. If you have, or if you have carried out any previous firmware updates, you may no longer be able to communicate with the unit – in this event you should upgrade your firmware using the TFTP method described below.

Attach your computer to your Ubiquiti unit – either by direct cable or via a standard switch. Give your PC a 192.168.1.XXX/24 address so that you can ping and communicate with the Ubiquiti unit on 192.168.1.20.

Use your web browser to log-in to AIR O/S. Navigate to the "System" tab and click the "Upgrade" button icon to select the OpenNet firmware file for your system. Note that while the Ubiquiti bullet2 and Nanostation2 share a common firmware file the Routerstation requires its own firmware image file.



## Option B – Firmware updating via TFTP

Connect your PC to your Ubiquiti unit and ensure that you have configured a 192.168.1.XXX/24 IP address on your PC.

Before you power on your Ubiquiti unit keep the reset button depressed and keep it depressed for ten seconds after power on.

You should now receive ping responses from the Ubiquiti unit on the 192.168.1.20 IP address and you are ready to proceed with the firmware upgrade.

You will need a “TFTP” client to perform the firmware upgrade procedure. If you use the Linux operating system you can install the TFTP client with your normal package manager. Windows Vista also has a TFTP client available via the “Programs” configuration in the control panel. For other operating systems you will need to identify and obtain a TFTP client application.

Launch your tftp with 192.168.1.20 as the target (e.g. “tftp 192.168.1.20”).

Upload your firmware image as a binary mode transfer (e.g. “bin” followed by “put IMAGEFILE.bin”).

The transfer should not take long as it is a small file and no errors should occur.

Once the transfer is completed the Ubiquiti unit will write the file to its flash storage memory and this will take a few minutes.

Create an account on [www.opennet.ie](http://www.opennet.ie)

Point your browser to <http://www.opennet.ie/manage> and create an account. This is free, easy and quick.



## Add your OpenNet access point node to your account

If you have just created your OpenNet account you'll be immediately prompted to set up your first network and attach your first access point node. In future, for any additional nodes, you will need to choose the "Configure → Add Nodes" menu option.

To add Ubiquiti access point nodes you need to supply the unique node "MAC" address. This is printed by Ubiquiti on every device they ship. All Ubiquiti MAC addresses begin with the characters "0015". You'll find the MAC address in the following location: -

Nanostation2	Remove the cover where you plug the Ethernet cable. Note the small white sticker with the 12 digit MAC address located under the "MAC ID" text.
Bullet2	Unscrew the bottom cover. Note the very small white sticker under the equally small "MAC ID" text.
Routerstation	If you are using a Ubiquiti miniPCI network card installed in your Routerstation you will find a small white sticker with a bar code and, under this, the 12 digit MAC address detailed.

## Connect your first Access Point node to the Internet

Once you have completed the above tasks your OpenNet access point node will automatically connect, over the wired Internet connection, to the OpenNet central system and configure itself with the Network SSID and other settings you specified in your OpenNet Network settings.

All future nodes that you add to your Network can gain internet access from its immediate neighbours and would not need its own fixed wired Internet connection.



## Case Studies

### Tyrrelstown housing development

- A free Internet project powered by 18 Ubiquiti Nanostation2 units
- High density apartments and houses
- Population of over 4,000 people
- Over 261 Individual users have gained Internet access on this network since December 2008



### Wicklow Enterprise Centre

- Home to 65 start-up businesses
- Broadband Internet available to all tenants through the wireless network comprised of Ubiquiti Nanostation2 and Ubiquiti Bullet2 units.





## Schoil Mhuire, Wexford

- Primary school with just over 120 pupils
- Internet delivered by Ubiquiti bullet2 units facilitates wireless Internet access to the school's DELL notebook computers
- Undesirable content filtering and restricted computer access allows the school to comply with Irish department of education net security guidelines

## Holiday Broadband

- Currently operating in three tent, mobile home and camper sites in the south-east of Ireland
- Pay-per-use broadband Internet access available site-wide by Ubiquiti Nanostation2 units with cash or credit / debit card payment options
- Analysis shows that a single camping space earns an average of a euro per week in income during the summer season (at EUR 4 per 24 hour Internet access).

UPDATE: Analysis for June/ July (high season) shows that a single camping space returns 6.25 euro per month.





## Project Status

### Current/Future installations

- Currently Installing Camping Pors Peron, Brittany, France. OpenNet has done very well in holiday locations in Ireland during 2009 and France is the obvious gateway into main land Europe (direct ferry crossing from Ireland).
- Currently discussing a trial community Internet roll out with an IT company based in Ghana, Africa. Our experience with [free for use] community networks has been positive in Dublin, Ireland.
- Proposing an educational pack for rural school networks. Have had preliminary discussions with BT Ireland who have the broadband supply contracts with the department of education in Ireland. Currently trialling in one school.
- Have had meetings with CIE/Bus Eireann (state bus company) regarding a WiFi installation on the Dublin → Cork rail line (120KM). The Internet supply will be via a 3G (HSDPA) mobile network based receiver and a requirement, as requested by CIE/Bus Eireann, will be GPS positioning and reporting. Engines will have active mobile network connectivity and carriages will use mesh repeaters to provide Internet to all passengers.

### Future technology updates

- Splash pages are already multi-lingual. Entire management web site will be multilingual (Java bean based code completed and all pages need modification to wrap the target text with the translation bean). Computer based translation is developed using Google translate API with local, automated, database caching
- GPS enabling the Ubiquiti router station with the Commell MP-954GPS miniPCI unit. This is current in active development for a trial train product
- Investigate the integration of back-haul point-to-point equipment management (802.11a/n) into the existing management system alongside the existing MESH and user management.



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## Open Source

- Open|Net is being released as open source under the GNU GPL version 3 license. This was a requirement for entry into the Ubiquiti Router station challenge and is also fitting with our own objectives - in particular in relation to community based networking projects. In addition Open|Net is heavily reliant on existing open source software packages.