ROAMAD

Case Study — Citywide Wi-Fi, Perth

*Australian licensed communications carrier aCure Technology has deployed **metro**mesh, a fast-growing RoamAD based citywide Wi-Fi network in downtown Perth, Western Australia. The network covers several square km of dense urban development and allows **metro**mesh to offer mobile and fixed broadband Internet access, as well as mobile voice and video services to business users, municipal workers, guests, and residents of the city.*

Background

Perth is the capital of the state of Western Australia. With a population of well over 1 million people it is one of the fastest growing cities in Australia.

The downtown area of Perth is amongst the fastest growing centres in Australia. Perth is home to a range of businesses, shops, hotels, and residential complexes. Perth's lifestyle is easygoing with a number of inner city parks adding to the relaxed, nature-based feel of the city.

Residents and businesses in downtown Perth have access to a range of communications technologies including 3G cellular networks, multiple hotspot networks and both cable and ADSL fixed line networks within the city area.

The Challenge

The founders of the ***metro****mesh* network ran a successful IT services business and were looking for ways to extend their business scope. According to Glenn Farrow, managing director of aCure Technology and ***metro****mesh*, they were looking for a business which had the following attributes:

- Complemented the skills and capabilities of the existing IT services business
- Required little capital to start the business and could quickly become self financing to support growth of the business
- Potential for significant business success, not just in Perth, but could be "exported" to other cities within Australia, and potentially to other countries

> RoamAD's solution was more cost-effective and flexible than other vendors' solutions that we looked at. In fact, the RoamAD solution and software driven business model enabled us to save up to 60% of our up front start-up costs - ***metro****mesh—June 2005.*

The Options

Glenn and the team recognised the growing demand for high speed wireless connectivity for residents, travellers and business people in Perth. ***metro****mesh* was created specifically to provide wireless ISP services to address this need. The team's challenge was to select a technology that would optimally support its business goals.

Major providers had already launched, or announced plans for the deployment of, 3G cellular networks and high-speed wireless networks based on proprietary technology.

Each of these technologies provided specific benefits and drawbacks in that:

- 3G networks provided good mobile voice coverage but had limited high-speed data support
- The proprietary wireless networks provided high-speed data support, but lacked the mobile functionality of the 3G networks
- Both technologies also were expensive for the end user (who had to purchase special cards for the proprietary networks) or for the network operator (as 3G networks are expensive to build)
- The currently available technology options involved the provider licensing access to spectrum which further increased the total cost.

The ***metro****mesh* team recognised that a Wi-Fi based network addressed a number of the issues associated with the current network technologies in that it was low cost, and provided support for voice and broadband data support.

metro*mesh* management decided that if it could identify a wide-area Wi-Fi based option that addressed these issues and was robust, scalable and supported mobile voice, then they could compete successfully with alternative solutions.

About RoamAD™

RoamAD™ is the leading supplier of carrier grade wireless software for mobile VoIP/VoWiFi enabled citywide Wi-Fi mesh networks, highway Wi-Fi networks, campus hotzones and cellular backhaul.

RoamAD's radio-agnostic, software-based platform can be installed on commodity hardware. The software platform is remotely upgradeable and is optimized to support mobile broadband data, video and mobile VoIP/VoWiFi.

RoamAD networks are now deployed in North America, Europe, Asia, the Middle East, the Caribbean, Australia and New Zealand. For more information see www.roamad.com.

To Mesh or Not to Mesh?

Once the founders of ***metro**mesh* had identified that it wanted to deploy a citywide Wi-Fi network solution in a dense urban environment, the question remained as to which solution to select.

To this end ***metro**mesh* examined traditional Wi-Fi mesh solutions, dual radio Wi-Fi mesh solutions, and multi-radio node infrastructure-mesh Wi-Fi solutions.

***metro**mesh* quickly identified that in order to successfully deploy a scalable network with robust performance in a dense urban environment, a multi-radio infrastructure mesh solution with three-dimensional coverage was required.


Group offers aCure for broadband bug

WiFi player claims network will cover 80pc of CBD market by Christmas

The Solution

Prior to selecting RoamAD as the platform for the ***metro**mesh* network, the company conducted an extensive world wide review of available technology options from a multitude of leading vendors.

***metro**mesh* selected RoamAD's infrastructure-mesh network architecture and wireless networking platform with support for multi-radio network nodes (4 radios per node mixing 802.11a/b/g) as the platform of choice with which to move forward.

With RoamAD, ***metro**mesh* was able to deploy a three-dimensional citywide muni Wi-Fi network, which satisfied their core requirements and gave them the following benefits:

- **Low capital cost** to launch a service – ***metro**mesh* licensed RoamAD's wireless node software and server software and integrated it into multi-radio nodes that were assembled by ***metro**mesh* in accordance with the RoamAD hardware reference design. This also gives ***metro**mesh* control over the node hardware
- **Low operational cost** – RoamAD's node software is remotely upgradeable and the network can be controlled and operated via RoamAD's web-based management platform. Further, the nodes assembled in accordance with the RoamAD hardware reference design are sufficiently small and use low power radios which enables them to be installed without the need to comply with demanding telecommunications regulations, resulting in ***metro**mesh* having a simpler and cheaper node site acquisition and node site rental cost than any other approach
- **Highly scalable** in terms of bandwidth, users and geographic coverage area — the network could grow from a small number of network nodes supporting a small number of users to a large network covering all of Perth. The use of multi-radio nodes (with separate radio and spectrum for backhaul (802.11a) and end user coverage (802.11b) makes for a more scalable and more robust performing network
- **Inbuilt upgrade path** to support new radio technologies (such as WiMAX) and new functionality (via the remote upgradeability of RoamAD's node and server software)
- **Three-dimensional coverage** (indoor and outdoor) over a dense urban environment allowing users to access the network whether they be on the 23rd floor of a building or down on street level
- Full support for **high-speed mobile VoIP/VoWiFi** – With RoamAD's edge-node intelligence, pre-authentication system, fast mobile handoff, and predictive routing technology, ***metro**mesh* knew that it would be able to offer marketing leading mobile VoIP services across the network
- The RoamAD web-based management platform gives ***metro**mesh* complete real-time visibility and control of all aspects of the network

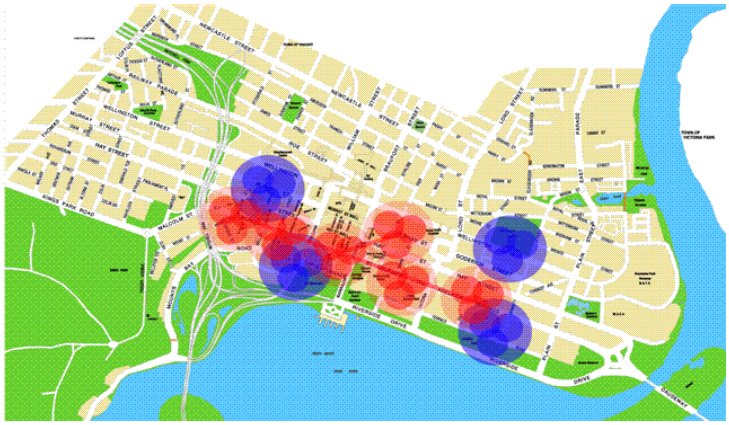
> We are delighted with the high level of support and customer service that RoamAD provides to us, especially during the pilot phase and since the commercial launch of the network
>
> — Glenn Farrow, managing director, ***metro**mesh*

The Results

***metro**mesh* has built a network that covers most of the Perth central business district (CBD) and is on target to achieve 80% coverage.

The public access ***metro**mesh* network, which is designed to support standard wireless devices, is ideally suited to deliver exceptional performance and reliability in the challenging three dimensional space of a city centre.

Statistics show that the mix of users is a varied cross section of tourists, static and mobile business professionals, travellers and mobile users. The customer feedback has been very positive and the performance of the network has exceeded all expectations with regard to coverage, signal strength and network economics.



Map showing metromesh coverage area. Source: metromesh

Customer numbers on the network have been better than anticipated and costs have been less than planned, resulting in the network becoming self funding within 6 months. The usage of Wi-Fi networks is set to increase dramatically with the increase in availability of multi-mode phones and the provision of seamless integration of voice and data. Using RoamAD technology customers on the network can walk or drive through the coverage area and maintain a high quality roaming voice call.

Not Just a Carrier

To further enhance its business economics, ***metro**mesh owner,* aCure Technology, has now started assembling its own multi-radio wireless nodes in accordance with a reference design published by RoamAD. By assembling the equipment locally, ***metro**mesh* can incorporate the latest components and derive an immediate benefit from new technology as it is verified. aCure Technology has received AS/NZ 4771 and C-Tick certification for the nodes.

aCure Technology has since started to sell its network nodes overseas. "We are starting to export RoamAD compliant network nodes," said Farrow. "We assemble them here in Perth, and we have about 6 quotes out worldwide through RoamAD as our primary partner, to a range of countries."

Why RoamAD?

Using RoamAD technology, muni Wi-Fi networks can be deployed faster, at lower cost, with complete multi-storey indoor and outdoor coverage in dense urban environments, and with greater flexibility and support than with any other approach available today. Being software-based, RoamAD's platform is responsive to partner and user enhancement requirements.

RoamAD's carrier-grade wireless networking platform, infrastructure-mesh network architecture, and use of multi-radio wireless nodes:

- Provides support for high-speed mobile voice and data services
- Results in a scalable, secure, network architecture with robust dedicated backhaul supporting QOS, low-latency applications, and fast mobile hand-off
- Is remotely upgradeable to enable support for new radio technologies (such as WiMAX) and new applications as they emerge
- Allows the use of low-cost, standards-based hardware available from a range of equipment suppliers
- Allows for flexible, 3-dimentional deployment options for multi-storey coverage in dense urban environments
- Includes carrier-grade network management systems and interfaces to carriers' or ISPs' backend systems

With RoamAD technology, citywide Wi-Fi networks can be deployed with a broad range of options to quickly and cost-effectively deploy a Wi-Fi network with unmatched flexibility, upgradeability and service options.

For more infromation about ***metro**mesh* see www.metromesh.com.au.

For more information about RoamAD's products and solutions please visit the RoamAD website or contact the company directly.

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