



Industrial Wireless Mesh Networks

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THE QORVUS NEWSLETTER
April 20, 2006 - Vancouver, WA

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Welcome to the fourth edition of Qnews™, Qorvus Systems quarterly newsletter. We'll do our best to make it both brief and useful. As always, your suggestions are most welcome.

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WiNog Show:

It was nice to see many of our clients and other friends (and to make some new ones!) at the recent WiNog show, March 13-15, in Austin, TX. We had a great show, both in our new

booth and at two hosted presentations for mesh technology; the Wireless ISP business is maturing considerably, and this was in evidence everywhere.

Along this line, just before the show we changed the price of Qcode to \$225 for the CF version, and removed the software download option for new customers from our website. We took these actions because it has become painfully apparent that with our limited staff size and resources, we can't afford to properly support both our commercial WISP clients, and experimenters who pick up a few copies of Qcode and then build their own equipment. Personally I regret this because I've been an experimenter for years. But our commercial clients have to come first.

After the show we jumped into the Corvusmobile (a 1989 Vixen) and headed west. There is a part of southwestern Texas in which the nearest towns are over 100 miles apart. About 30 miles outside of one of these towns the fuel pump quit. We waited at the Best Western in Fort Stockton, TX...and waited...and waited...and waited... for three days. BTW, they need wireless internet access (and a Starbucks) in that town in the worst way. Anyone interested?? I now know most everyone there on a first-name basis and can put you in touch with the right people ;-)

Using 5 Ghz for backhaul and 2.4 for mesh

As you roll out ever-larger networks, and face increasing customer demands to provide VOIP and other bandwidth-consuming streaming content services to your customers, it's becoming critical to scale-up to push more bandwidth to the edge of your mesh network. For some time, the Qnode and the QnodeJr have been available in dual-radio configurations which allowed you to do some of this using only 2.4 Ghz. But just in the last few months, several of our clients have been taking advantage of the new capabilities in Qcode 3.1 to use a "hybrid" approach to wireless deployment. This approach uses 5 Ghz for point-to-point or point-to-multipoint backhaul, while meshing on 2.4 to provide "last thousand feet" of customer connectivity.

Even our competitors have recently gotten on the 5 Ghz backhaul bandwagon. For example, Tropos just announced that they had added Motorola Canopy backhaul support to their mesh routers. Of course by the time you add the \$3000+ cost per node for Tropos to the almost \$600 cost-per-client for Canopy, you're up to nearly \$4k per node, and you have to use two different management interfaces. We think you'd rather spend under \$1500 per Qnode for the same functionality and better bandwidth, not to mention the advantages of having all the radios in the same box, single-point management for both mesh and backhaul, and the lighter weight and easier install of the Qnode and QnodeJr!

Our largest deployment to date using this hybrid approach is at **Sirius Systems** in Lawton, OK. This network now has around 75 QnodeJr's deployed using primarily 5 Ghz as the backhaul mechanism. Dave Davault, Sirinet's chief engineer, reports excellent results in terms of getting as much as 5 Mb/s bandwidth to his clients using this approach.

There is one important limitation to keep in mind- 5 Ghz hates any obstructions, especially trees, in the Fresnel zone. But if you're able to get a clean shot between antenna locations its worth considering. If not, 2.4 is still a better choice.

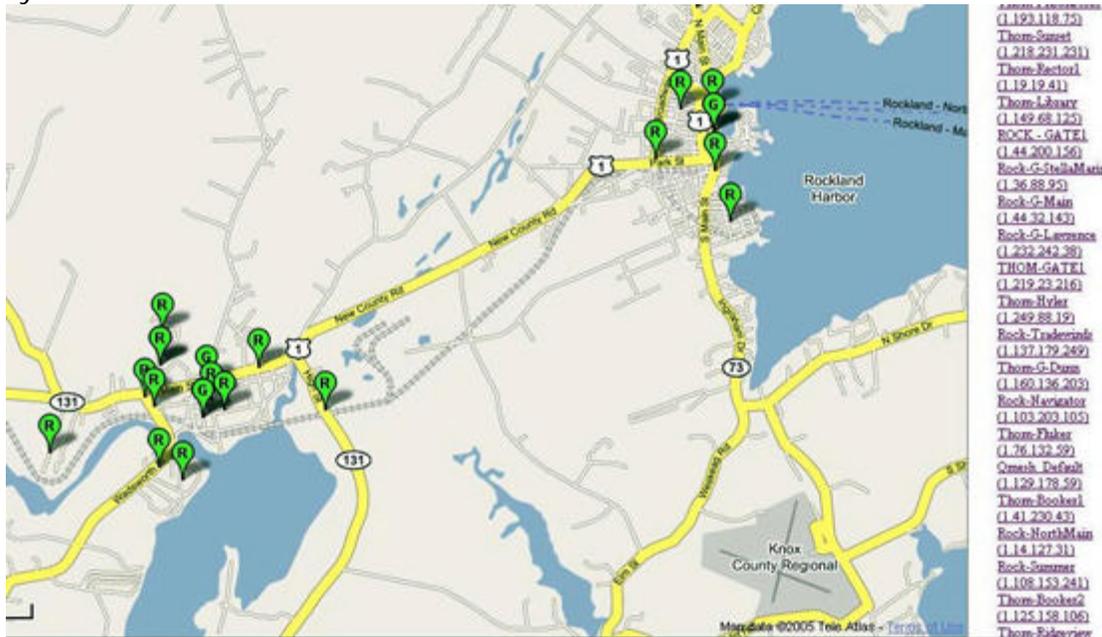
Detailed instructions for setting up the Qnode and QnodeJr on 5 Ghz are available here:

http://www.qorvus.net/downloads/Qcode_3.1_setup.pdf

And of course we are available for consultation via email or phone (or field visits with 2-4 weeks advance warning) to help you get and keep your links and equipment working properly.

Geo-mapping and reporting:

Our demo of the built-in node status, geo-mapping and email alarms available through our Qportal™ system was a big hit at WiNog. All current Qorvus clients have access to this system here:



<https://www.qorvus.com/login/index.php>

Just enter your three-digit customer code and password. If you don't know it please send an email to support@qorvus.net.

Latest software!

Our team has been diligently working on improvements to our flagship Qcode 3.x code, and is just finalizing the release of the latest version, **Qcode 3.11**. This version has several significant improvements over the previous releases, including:

- **Atheros meshing and long-distance PtP or PtMP link support** which allows you to supply high bandwidth over many miles at 5 Ghz to the edge of your network (see article above).
- **Fully-expanded firmware** which greatly improves CompactFlash reliability over time, and reduces boot-up times. The original base-build system uses a cramfs

function that expand the system firmware “on-the-fly” every time the code boots up. In addition, it stored most log files on the CF. This means that the CF was subjected to many un-necessary writes which reduces its life, and increases the likelihood of file corruption. Our engineers have figured out how to place a fully expanded bootable image on each CF at the time of manufacture, greatly reducing this reliability issue. The only problem is that this part of the code has to be installed at here the factory (meaning you need to order it as a preloaded CF); we can’t download it to your system on the net. All the other 3.11 improvements can be downloaded, though.

- **Extensive advanced diagnostics** and timestamped syslog messages have been added to a separate page, accessible via the Diagnostics and Sytem Log links at the bottom of the status page.
- **SSL Management GUI** is now available at <https://<your Qnode's IP>:82/> for secure management of your nodes.
- **Greatly improved pc-engines WRAP board support** for high-speed NatSemi ethernet and hardware watchdog timer.

Find out the most recent updates here: <http://www.qorvus.com/releasechart.htm>

New Installations!

More and more folks are discovering the benefits of rolling out wireless internet services in rural areas with Qorvus mesh technology, and some of these new deployments are quite large. Among larger recent installations are **Kehr Wireless** in Memphis, TX with around 30 dual-radio Qnodes, and **Sirius Systems** in Lawton, OK with around 75 dual 2.4 / 5.8 Ghz Qnodes. Both companies plan on significant further expansion throughout the rest of the year.

In addition folks are re-discovering our **MeshCam™** product line, which provides a truly compelling value proposition for secure and easy-to-deploy wireless meshing IP cameras for a variety of applications. These range from simple perimeter monitoring to asset tracking, observation of traffic intersections, and so on. The MeshCam can act both as a wireless IP camera and as a Qnode at the same time, and can be supplied in single or dual-radio versions. More information on the MeshCam can be found here:

<http://www.qorvus.com/meshcam/index.html>

and new MeshCam installations are underway in Antigua, Alabama, and Pennsylvania.

Odds and ends...

We’ve recently gotten reports of water penetration problems with several of our nodes. As it turned out, these were primarily from installation issues. A QnodeJr had been installed with the ethernet connector facing up. This connector is waterproof, but only when installed facing down, as shown in the manual, and with the mating waterproof ethernet connector we supply with the QnodeJr.

A Qnode was returned to us with obvious internal water damage. However it had been installed without the required densyl or hvac aluminum sealing tape across the top of the

cabinet. This is also shown in the installation manual.

It's also a good idea to review the need for lightning protection in all installations. Recently we've replaced several radios and POE splitters that were damaged by nearby lightning strikes, and where the antenna or ethernet cables did not have required in-line lightning protectors. This kind of damage is not covered by the warranty.

If you haven't looked lately at our [meshforum](#), this would be a great time - we've really expanded the available information on the site quite a bit over the past few weeks.

Once again, we really appreciate your ongoing support, and wish you all the very best for a healthy and prosperous 2006.

Your Team at Qorvus Systems:

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