

HermonNet

Over the last ten years, the Town of Hermon and its school district have created an remarkably innovative approach to high-speed computing and internet service that has made it possible to provide both services to all students (K-12, both in the school and at home), to other residents of Hermon, to municipal offices, to the library and to Hermon businesses. Hermon and HermonNet offer an exemplary model for other communities in Maine of what a community network can achieve.

HermonNet began as an initiative in the Hermon schools and as a partnership between schools and community. The Hermon schools continue to be at the heart of the network. HermonNet employs Linux terminal services. These include central Linux terminal servers (housed in the schools) and user terminals (essentially free). Within the school system user terminals are accessible to all students, faculty, and staff, K-12. Servers and terminals provide access to a common computing desktop and to the internet. They allow all students, faculty, and staff to participate in a networked academic community. Through the network, the common computing desktop and internet service are available at anytime from anywhere, on the school campus and off. All members of the educational community can access Linux servers from home, and the same access has been made available to all residents of Hermon, all businesses, and all municipal offices as well. Terminals have been installed in every available area throughout the school district, including homes, though in homes existing personal computers (old or new) can also be configured to serve simultaneously as terminals by using NX Client. Of approximately 2,000 homes in Hermon, more than 1,500 are now connected to HermonNet.¹ Network resources and services are available around the clock throughout the year, thus optimizing community investment in the network. Schools, municipal offices, and business account for most of the traffic during the day, while public and home academic use account for the utilization of the services in the evening. The network utilization runs cyclical usage patterns that reflect the daily routines of the academic and working communities like the passing of the tides.²

HermonNet uses Fedora Core Linux and public domain software. It uses Citrix to connect the Linux desktop to Windows applications when needed. The use of Linux and public domain software represents a significant savings for the network and the community that funds it (because it is in the public domain, it can be made available to every resident of Hermon at no cost). Each server can run 40 terminals simultaneously. The cost of a server is approximately \$2,000. Terminals are essentially free because they are made from obsolete personal computers (donated by Maine businesses, the general public, and State and Federal agencies) that have been converted into Linux user terminals

¹ An additional 400 home accounts in serve the Glenburn community through Glenburn.net which also serves the Glenburn's municipal office.

² HermonNet amplifies the workings of a typical rural community. Municipal services and communications become more accessible to a larger group of taxpayers. Students find that academic resources and learning extend beyond traditional brick walls and strict schedules. Members of the public find that maintaining online "yard sales" and simply keeping in touch with the neighbors has never been easier.

HermonNet

Page 2

(many of these terminals in Hermon have been provided by the Windham Prison's Computers for Schools program). Conversion costs an average of \$10 a unit. Where 40 personal computers with licensed software cost many thousands of dollars to own and operate, HermonNet can provide comparable service for about \$3,000. At the same time, where personal computers become obsolete in between 3-5 years, HermonNet hardware is long-lived. In the decade in which HermonNet has been using Linux servers, all have been inexpensively updated and none have needed to be replaced.³

HermonNet is a high-speed local area network (LAN) interconnected via a high-speed fiber optic campus backbone that includes the town municipal office and library. This backbone is extended throughout the community via enhanced dial-up and, increasingly, through meshed high speed wireless Internet access that is being installed through a public-private partnership with the RedZone Corporation. Dial-up has been offered free to all Hermon residents for over a decade. High speed wireless access has been offered for the last three years and its current deployment is extended at a modest rate (for most residents at approximately \$15 a month). While the wireless service is preferable for many residents, the dial-up service is much faster and more powerful than might be expected and has offered a transitional, if temporary, answer for community needs. Because computing takes place in the central server rather than the user terminal, phone lines are only required to transmit the user's screen, keyboard, and mouse commands. As a result even dial-up can provide usable access to the high-speed services of the common desktop and the internet. At the same time, wireless services are also enhanced by the relatively small amount of data that needs to travel over the wireless network from terminals to Linux server. In this regard, a community of personal computers would be far more demanding of available broadband services.

Because the schools are at the heart of the network, HermonNet has not encountered a problem that has hampered community networks in other parts of the United States: a lack of users. In Hermon the students have sold the network to the community as a whole. Because HermonNet value has been demonstrable to the community, and because of savings in technology through the use of Linux servers and terminals, the Hermon School District has been able to create a robust information technology department that not only serves the schools but also the town as a whole. Centralized computing allows for centralize support services in which server upgrades and enhancements immediately become available throughout the network.⁴

³ Even though terminals do not require upgrades every three years, it should be noted that donated equipment still pours in on a three year schedule making terminal upgrades to faster processors with greater audio/video circuitry a no-cost reality. At present HermonNet is in the process of supplementing its stock of desktop terminals with wireless terminals. Wireless terminals will be deployed in the spring of 2008 that will allow students to maximize the use of relatively slow wireless network services in the same way that terminal services leverages the use of dial-up. Additionally, because wireless terminals will be connecting to central Linux services hosted within the school district, questions of web content filtration, malware prevention (e.g. antivirus and antiadware protection) will be provides by the same services that protect students when utilizing Linux within the classroom. With wireless terminals all students (K-12) in all classes will have access to a computer at anytime and at a fraction of the cost of laptops.

⁴ The implementation of Linux technology in other Maine communities will require IT training for staff in those communities' school districts. Consolidation should make this manageable since each

HermonNet

Page 3

The HermonNet philosophy means looking out for and taking care of your community. For example, when a backup generator was purchased to support the network, the decision was made to purchase a sufficiently large generator so that it could support the high school as an emergency shelter for the town. As the next logical step, HermonNet became the technological backbone for the town's comprehensive emergency management systems.

HermonNet has made the Town of Hermon an ideal community partner for private internet providers like RedZone Wireless, since these providers work through the school IT department which in turn handles most support services required by the community.⁵ Far from being anti-competitive, partnerships with HermonNet are deeply competitive for the vendors who seek to do business in Hermon. Because the community has aggregated itself as HermonNet, it is in a strong position to negotiate partnership agreements. Vendors work with HermonNet which then becomes responsible for individual customers in community as the last-mile provider. In addition to RedZone, HermonNet works in collaboration with such companies as Verizon and Oxford Networks. At the same time the school has become a telecommunications hub for the community. It not only houses HermonNet, but facilities for Unicel and Rainstorm Consulting, a web hosting and development company.

The Joint Standing Committee on Utilities and Energy has asked for ConnectME to suggest a framework for supporting the development and implementation of community networks. One lesson to be learned from HermonNet is the way a community like Hermon (and by extension the State) can pool resources. The HermonNet model offers a remarkably innovative approach to community networking because it simultaneously addresses two vital needs that all communities in Maine must address: the need for high-speed computing (K-12) in the schools and the need for broadband as well as high-speed computing throughout the community. The two needs have tended to be addressed separately by the State; funding in one area has not tended to address the other. For example, funding for laptops and MSLN has not supported the broader community needs that ConnectME has a mandate to engage. Because Hermon has addressed both needs at once, it has been able to pool scarce resources and realize significant savings. It has discovered that an innovative solution for the schools also provides an innovative solution for the community. As a result funding for technology in the schools has also supported a robust computing network that serves both the schools and the broader community. The schools realize their potential as an economic and cultural engine for the town. Wherever possible this kind of pooling of resources should be actively encouraged throughout Maine so that the same funding can simultaneously address school and community technology

of the 80 or so districts will need and should have an IT department. The University of Maine is prepared to develop a training program for IT coordinators.

⁵ Support services extended from the academic community to municipal offices, general public, and the business community result in continuous learning opportunities for the schools' IT staff. These skills immediately translate into better service and greater opportunities for the schools and the community in an upward spiral of innovation and service. Student interns involved in this support structure find themselves working shoulder to shoulder with real-world professionals solving real-world problems. This typically results in the student interns becoming well-known as valuable technical resources to the overall community network.

HermonNet

Page 4

requirements.⁶ The HermonNet model suggests that the Department of Education, the Department of Economic and Community Development, and ConnectME should work collaboratively wherever possible. Not only will this save increasingly scarce resources. It will encourage Maine communities to address their needs *as* communities. In this way it will strengthen the vital social, economic, and cultural fabric of our state.

⁶ In order to provide a computer desktop and internet service to Hermon citizens, businesses and municipal offices, HermonNet has opted out of the Maine School and Library Network and pay for T1 cable access from private providers. While any school district in Maine could install Linux servers and terminals on the school campus and still connect to MSLN, to serve the students off-campus and the larger community, it would need to purchase additional T1 service from private providers as well. In the future Hermon should be able to reconnect to MSLN for on-campus services as well and use other T1 lines only for off campus services.