



Pilot Projects for Deployment of Wireless IP Based System in Rural Areas of Jordan

Background

Over 40% of the world population lives in rural and remote areas of developing countries, Jordan is no exception. Only a small fraction of those living in rural areas have access to basic services such as telephony, radio and television. The growth in the telecommunication industry prompted for the creation of many new applications and new services such as e-mail, e-commerce, tele-education, tele-medicine and tele-health just to name a few. Most importantly interactive multimedia services have become essential for rural and remote communities, just as important as voice communications. ME-NetComs believe each community or area requires certain voice, text, image, video and audio capabilities and thus a network infrastructure must be able to cater for such services.

ME-NetComs has examined the various technologies in conjunction with the needs of communities in Jordan to build a cost effective infrastructure that can provide reasonable bandwidth along with the support for a wide range of services in rural areas. We believe the delay in deployment of such network infrastructures has been largely due to the high cost of deploying a wired/fiber infrastructure for long distances to reach the rural areas. In addition, it seems the conventional PSTN technology proves to lack the power to provide many of the new services needed in the communities. Finally, the regulatory system has not allowed organizations to deploy newer technologies that work over the air (wireless) due to the exclusivity agreement signed with the Jordan Telecom.

ME-NetComs provides 80% of its solutions in the wireless arena, and took the initiative to further develop a plan to deploy a Wireless IP based system to serve the needs of rural communities, to bridge the gap that has grown between the city of Amman and its suburbs. As the world shifts from the conventional PSTN technology to newer and more advanced IP based technologies, it is critical that rural areas and communities are not left out. ME-NetComs found several IP based solutions to meet the needs of communities that utilize Wi-Fi or wireless technology that can provide high bandwidth and meet the multimedia services needed in those communities. Wireless routers and bridges can reach to distances exceeding 50KM over the air which means saving the cost of 50 KM of cables running from cities to suburbs.

With these factors in mind, ME-NetComs put together a pilot project plan, which included equipment, financial plans and the integration of the new service with current initiatives by the Ministry of Information and Communication Technology (MoICT) of building Tele-Centers in rural communities. The wireless infrastructure showed a huge saving in cost, a massive reduction in time of deployment, ease of extensibility when compared to traditional technologies.



Objectives & Expected Outcomes

The objectives outlined by ME-NetComs for the pilot project included:

- 1- Provide access to data and voice services where needed in rural areas in order to:
 - a. Increase access to general information
 - b. Increase access to medical information
 - c. Increase access to educational facilities
 - d. Increase growth and interaction of local businesses
 - e. Develop basic computer and ICT skills for local communities
- 2- Provide IP based multimedia services such as tele-medicine and distant learning and conferencing.
- 3- Use the success of the pilot project to serve as an example for other rural area development in Jordan and elsewhere in the region.

By meeting these objectives, ME-NetComs also outlined certain expected outcomes as a result of such an implementation which included:

- 1- Data communication for education and research enhancements:
 - a. Access to electronic libraries and training material
 - b. Access to research papers and news articles
 - c. Electronic labs and trials for students and teachers
 - 2- Tele-medicine services
 - a. Exchange of medical records
 - b. View and exchange medical statistics
 - c. Epidemic surveillance data
 - d. Transmission of X-ray and Lab test data
 - e. Direct communication through email or instant messaging with specialists and consultants.
 - f. Advanced remote diagnosis, ultrasound, MRI using video services
 - 3- Voice over IP services (If regulations permit)
 - a. Long Distance and International Call Savings
 - b. Inter-Community VoIP calling
 - 4- IT User training and support
 - a. Access to training and support material for various ICT skills
 - 5- Interactive Learning
 - a. Online courses and examinations in relevant subjects
 - b. Video conferencing
 - 6- Trade Information
 - a. Access to market information databases
 - b. Access to supplier, vendor and customer databases
 - c. Email and Web-forms for trade communication
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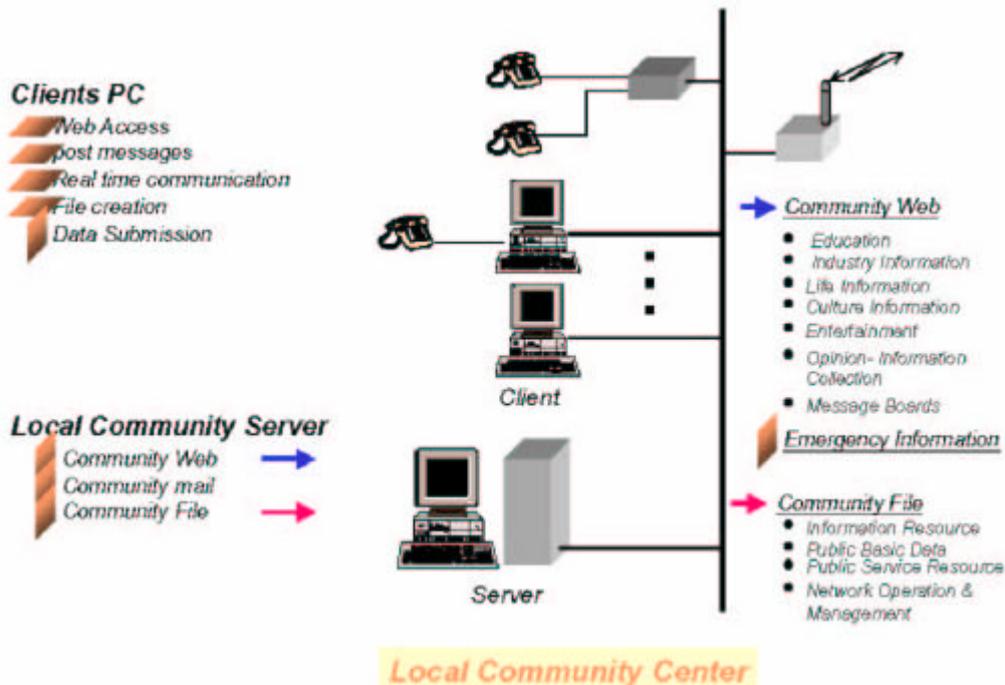


Wireless Deployment

There are several manufacturers such as Wi-LAN and Proxim which ME-NetComs represents in Jordan that offer the Direct Spread Spectrum hardware which operates in the 2.4 GHz unlicensed frequency that is needed to setup the infrastructure for rural areas, below is a summary of how the wireless technology will be deployed:

ME-NetComs believes there are two stages (which will run in parallel) in the deployment of the wireless technologies in the rural areas; the first is using wireless router based technologies and networks which can be integrated with current PSTN using gateways to transmit high quality voice calls over a closed network with the use of VoIP software and utilizing the wireless technology to create an effective Local Community Network, this is essential to allow the community to transmit data, multimedia, voice between the community population. The second stage would include the link of the community with the outside world, essentially to the internet.

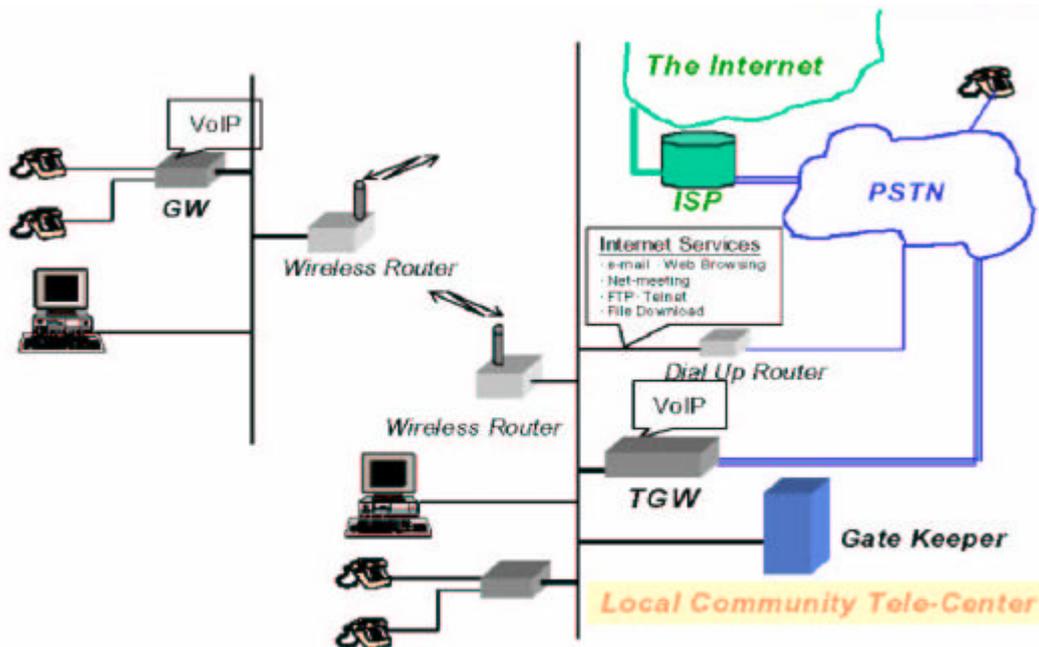
As the diagram illustrates below, a local community center or tele-center will house the main server (main, web, VoIP and file server) and the wireless base station which can send packets to multi-point residences or other smaller centers in the area. The center will house client stations/PCs for those who are near the center and wish to use the stations there.





Clients and other centers in the community will use different types of antennas and CPE (Customer Premise Equipment) depending on the topology and distance from the main center to receive IP packets transmitted to the antenna and since the system is an IP based system, any normal PC or other TCP/IP electronic devices can utilize the network.

The second stage is illustrated below, where the integration and link to the ISP will allow for WAN connectivity, which completes the Local network and Wide network connectivity allowing for all services to become available for the local community.



Summary

Actual details of equipment, hardware specs, costs and integration details are all part of the detailed design of this pilot project. There are current TRC (Telecommunication and Regulatory Commission) obstacles in Jordan that prevent the use of both Wireless WAN equipment and VoIP due to the exclusivity of the Jordan Telecom for voice and data connectivity until the end of 2004. ME-NetComs has submitted requests for the application of wireless technologies in rural areas in order to achieve a nation wide initiative called Connecting Jordanians. It is still under review, during this time ME-NetComs is also working on equipment approval and is conducting training seminars on the use of wireless technologies and its applications at local universities to raise awareness of the importance of wireless applications and the need for such technologies to bridge the gap between underdeveloped communities and cities around the nation.
