Mesh networking is a class of networked embedded systems that allow for multi-hop delivery of messages, are self-configuring, are self-healing and can route packets dynamically. These characteristics lead to very stable over long periods of time even when the wireless signal between nodes is unpredictable. In addition, deployment of mesh networks is straight-forward which is important when deploying many such networks.

A network capable of sending messages through multiple hops means that messages can touch many nodes on its way to its final destination without interacting with a server in between. An analogous network is a peer to peer network where clients talk directly to each other without interaction with a server. A self-configuring network is a network that can be configured without human interaction. A self-healing network is one in which nodes can be added and removed dynamically. This allows the network to grow as large as needed as well as recover from the loss of some motes. Finally, dynamic routing is the ability to change message routing based on current network conditions such as link quality, hop-count and other metrics.

To support a wireless network deployment, there are three software tiers; the client, server and mote tier. The client tier allows users to manage the network and view the status of the network. The server tier serves as a buffer and interface between the wireless network and the internet. Unlike the client tier, it is important that it is always on as long as the network is deployed. Finally the mote tier is the software that runs on the motes themselves. Crossbow provides MoteView for the client view, Xserve and XOtap for the server tier applications, and the mote tier provided by Crossbow is XMesh.
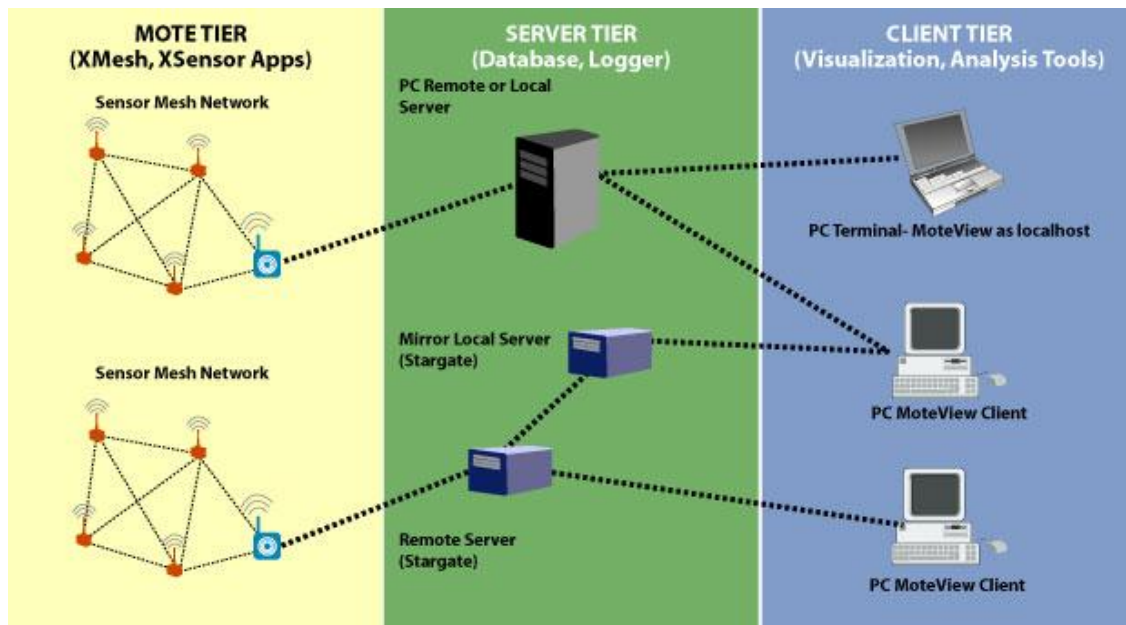
MoteView not only provides an interface for deploying and monitoring networks, it also provides tools and methods for exporting data gathered from the network, analyze it and graph the results. MoteView supports all Crossbow sensor boards, and in addition supports MICA2, MICA2DOT and MICAz and some MEP and MSP platforms. These motes must be running XMesh to connect to the Crossbow network.

MoteView can be installed on Windows XP Home, Windows XP Professional, and Windows 2000 with SP4. The base station must be able to connect to the network somehow, and there are several options for doing so. A serial port or USB port can be used for direct access. Alternatively, if the gateway is on an Ethernet LAN, a wired or wireless Ethernet card can be used. Finally if a Stargate base station is used instead of a PC, some mechanism for connecting to the Stargate station must be available – either an Ethernet card or some other mechanism for connecting to the internet such as a cellular modem. Finally, some additional software must be installed and configured on the PC on which MoteView will be installed. PostgreSQL 8.0 Server and the ODBC driver must be installed, as this this is where data will be stored as it is read from the network. In addition version 1.1 of the Microsoft .NET Framework must be installed as well. Fortunately, these additional requirements as well as the core software can all be easily installed by following straight-forward prompts in the installation application.