

## **MESH Network Technology** **A MESH Network and WTI's MACH-V**

So, what is all this talk about MESH Networks?

A MESH network is a type of Local Area Network (LAN) that utilizes redundant and distributed nodes connected to one another to route data, video and audio.

Wireless MESH networks were originally developed for use in military applications but, over the past decade, they have undergone significant changes and upgrades to make them available for the civilian market. As the costs to build the radios went down, single radios evolved to support more radios per MESH node with each radio having the ability to provide specific functions and able to support multiple radio cards operating at different frequencies. Many MESH Networks are able to operate across multiple radio bands.

These types of networks are very reliable and provide a redundant system. MESH networks were designed to be self-healing; meaning the network would be able to continue operating when one or more nodes goes down.

So what does this mean? Say, I have seven radios hooked up in a MESH and number 3 and 5 go down, number 2 will just skip number 3 and head on to number 4 and 4 will skip 5 and head to 6 and vice-versa. I never lose my signal and the video/audio/data gets to where it needs to be.

Ok, they sound great – but what are the downsides to this kind of system? The biggest drawback to full mesh networking is the expense involved because of the number of cables and connections that are required. In very large areas there have to be hard-wired nodes every few miles, instead of only wireless nodes, to maintain reliable connectivity.

However...

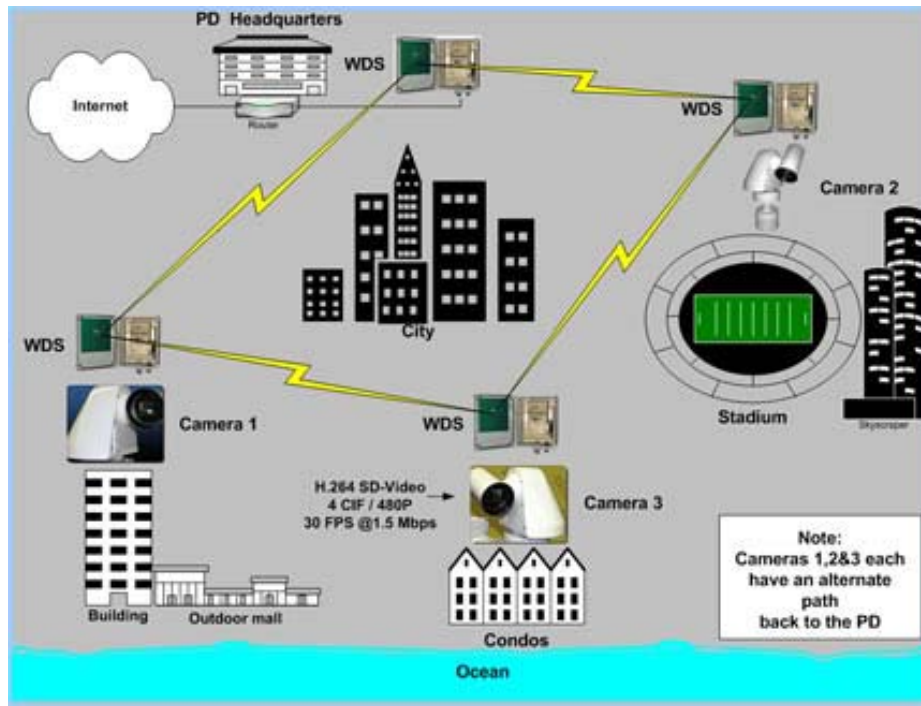
## **MACH“ing” the MESH:**

Wireless MESH networks are pretty good and they benefit most applications, but not all. Within a planned topology, to provide efficient network access to fixed and portable IP devices which require low to medium bandwidth demands, a MESH radio network is a great way to do this. However, when using multiple individual devices with varying high bandwidth demands, a MESH network topology is not necessarily the best way to transfer this data. This is especially true in the video surveillance industry where high bandwidth requirements for real-time IP video are sometimes necessary.



MESH radio networks (like other IP radio networks) are susceptible to RF interference, bandwidth degradation and network latency. There are sophisticated MESH radios with features like self discovery, self tuning and self healing that do a better job contending with these issues, but they are 3 to 5 times the cost of a traditional IP radio like the MACH-V. The MACH-V radio can be configured as a point to point, point to multi-point or as a wireless distribution system (WDS). In WDS mode, and with careful consideration of bandwidth restraints, a series of MACH-V radios can be deployed to provide some of the same functions as a MESH radio network but at far less cost.

Below is a sample scenario where the MACH-V is used in place of MESH radios:



One can't deny the positives of a mesh radio network particularly the flexibility, scalability and its configuration tools but, in this current environment of budget restraints, the MACH-V is an economical solution that will meet many of the goals of a mesh radio network.

~K. McMillan, WTI

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