Wireless MESH Network Application

White Paper

For

KW7000 Series

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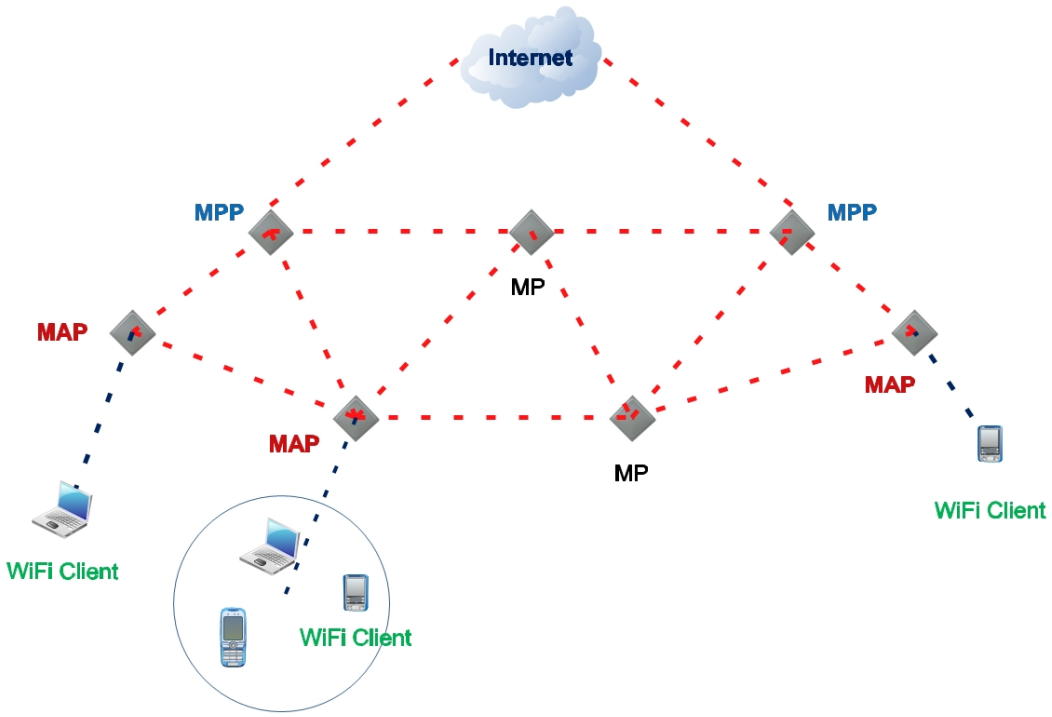
Summary

Wireless Mesh Network is an application technology different from the traditional peer-to-peer wireless bridge, it provides the multi-hop and multi-path connection to form a wireless environment of MESH framework so that the occurrence of single point if failure can be prevented. Under the traditional mode of wireless bridge, if something wrong happens to just one of nodes, the whole network will be affected at once, with the result that data transmission cannot proceed continually. However, the characteristic of wireless MESH network is to take the way of resembling routes to recalculate a new effective path as nodes fail, and keep data transmitting through repeating and hopping from one node to another.

Role-play for Components in Wireless Mesh Network

In this multi-hop wireless MESH network, any node can be connected to other nodes in a wireless way and delivered the packets from others.



There are 3 types of components under the framework of Wireless Mesh Network:

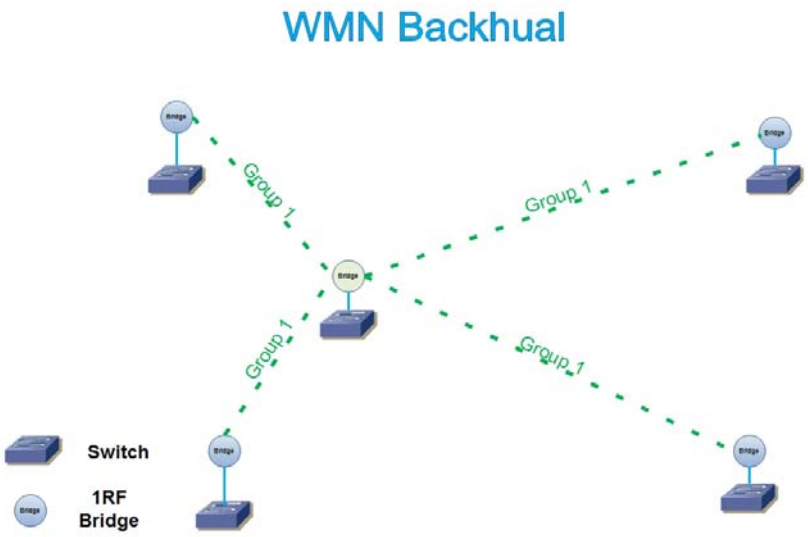
MP (Mesh Point) : Nodes in the mesh network, in charge of the delivery of the packets from each node.

MAP (Mesh Access Point) : It works with the functions of middleware transmission in the mesh network, and plays the role of a RF Access Points.

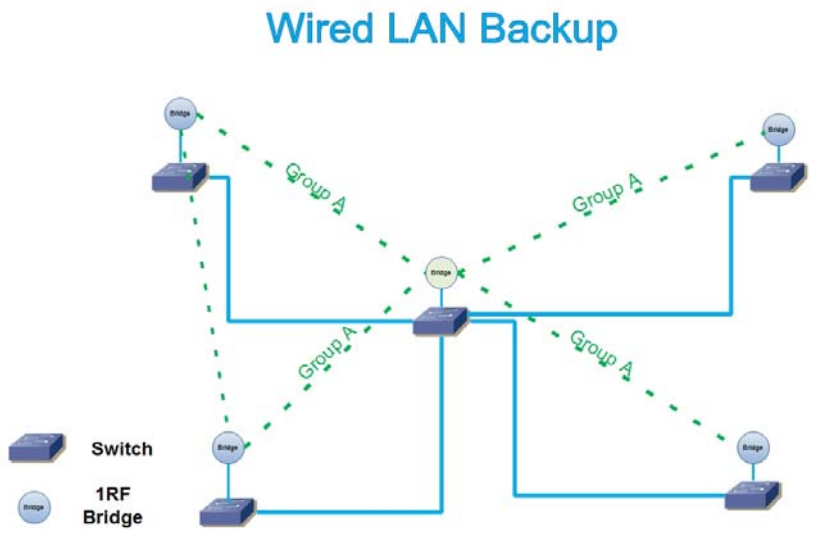
MPP (Mesh Portal) : It plays as the bridge for interfacing two networks, usually connects the wired network with the wireless MESH network.

Application Framework of MESH Network

Wireless Backhaul: It constructs a wireless backhaul rapidly by using the MESH network in the areas that are not easy to wire. Especially for the temporary and short-termed working area, it can avoid the waiting time of applying for a least-line. When moving to the next working area, no sooner had the set-up location been chosen than the network backhaul can be constructed quickly, meanwhile, the number of nodes can be adjusted to fit the demands for the real environment.

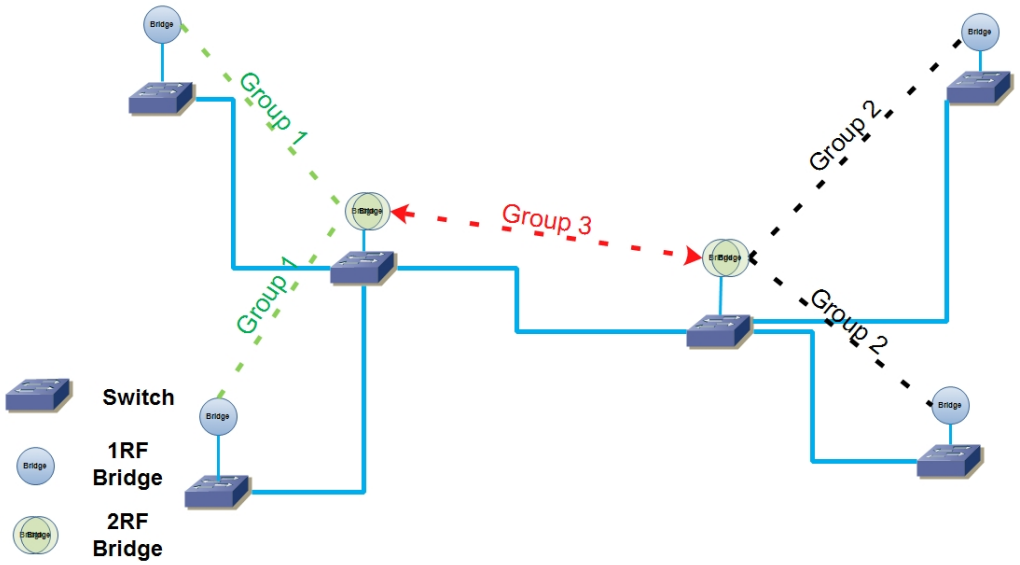


Backup Network: To satisfy a non-interrupted operation environment, make use of MESH network to build up a backup network. When a breakpoint happens to the physical line, the wireless network can take the place of the original lines at once and maintain the necessary operation until the physical line is repaired.



The example showed below is a backup network constructed by the MESH network bridge, it provides an emergency support to maintain the necessary data transmission when the wire network comes across the disconnection. In order to prevent the inter-competition and interference between the frequencies, the different groups can be planned and combined according to the demands. In the case, with the limit of the terrain and landforms Group1 and Group2 connects each other through the directional antenna to get better quality of connection. Therefore, the MESH network bridge with Single RF or Dual RF is taken to gain the best effect of interconnection.

Wired LAN Backup



Discussion

Compared to the Peer-to-Peer Bridge, the application of Wireless MESH Network provides more flexibility, especially when used for the multi-point connection within short distances, its investment benefit will increase comparatively.

Generally speaking, an Omni directional antenna will be mostly applied in the framework of the MESH network. Each node receives at least two node signals, so the interference between the nodes nearby happens more easily. As a result, it is quite necessary to adjust the output power of the bridge. The wireless signals are not that better just because they are stronger, only a proper coverage can prevent the interference. The drop height between two points should not be too large, particularly when using an omni-directional antenna to transmit the data. In certain environment, a directional antenna can be considered to get the better gain. In the backup environment, the planner should take into account the loop problem resulted from the integration of wired network and wireless network.

Usually, Spanning Tree Protocol can solve the loop effectively.