



*For*  
***MESH DYNAMICS***  
***SYSTEM INTEGRATORS***

**CUSTOM CHANNEL SETTING  
WITH  
MD4000 RF EDITOR UTILITY**



## RF Editor Terms and Conditions

---

RF Editor is a powerful capability that, if used improperly, may cause MeshDynamics products to operate in an out-of-specification frequency that is not legal in a particular region. Use of RF Editor is entirely at the user's own risk and no guaranty is offered by MeshDynamics for the suitability of the users' RF Editor settings, configurations, or usage.

MeshDynamics provides the RF Editor capability "as is" without warranty of any kind, either expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The entire risk as to the quality, legality, and performance of RF editor is with the user. Should the RF Editor prove defective, or cause MeshDynamics nodes to generate RF in an unavailable or illegal frequency in a particular region, the user will assume the cost of all necessary repair, correction, or legal action.

In no event will MeshDynamics be liable for damages, including any general, special, incidental or consequential damages arising out of the use of or inability to use RF editor (including but not limited to loss of data or data being rendered inaccurate or losses sustained by the user or third parties or a failure of the MeshDynamics nodes to operate with any other equipment), even if such holder or other party has been advised of the possibility of such damages.

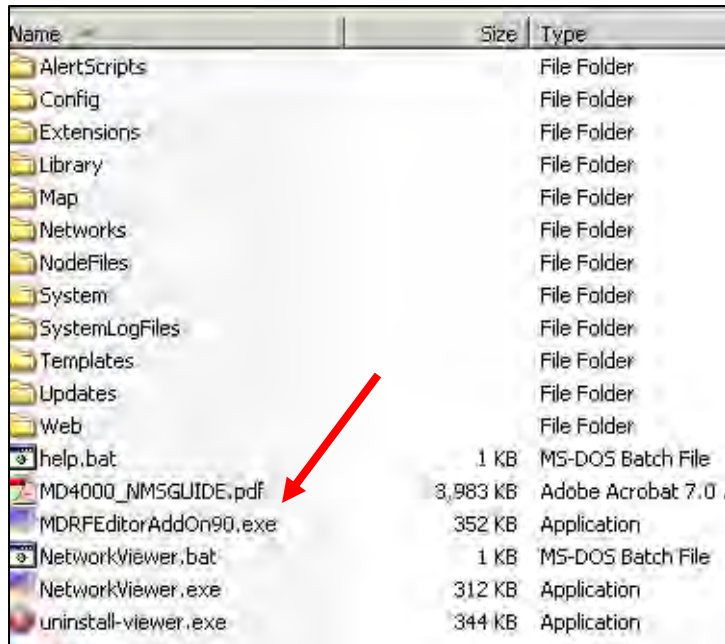
Please cut and paste the above on your company letterhead.

Sign and email to [techsupport@meshdynamics.com](mailto:techsupport@meshdynamics.com)

MeshDynamics will then provide the add on options needed (see next page)

MeshDynamics will send you the MDRFEditorAddon.exe after your disclaimer is verified.

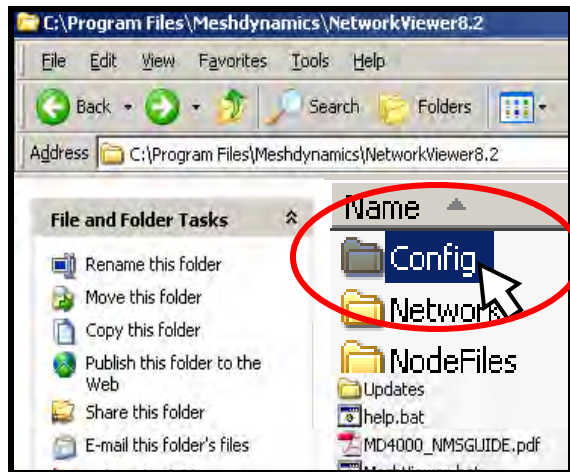
Place the exe in the NMS file folder root, see below.



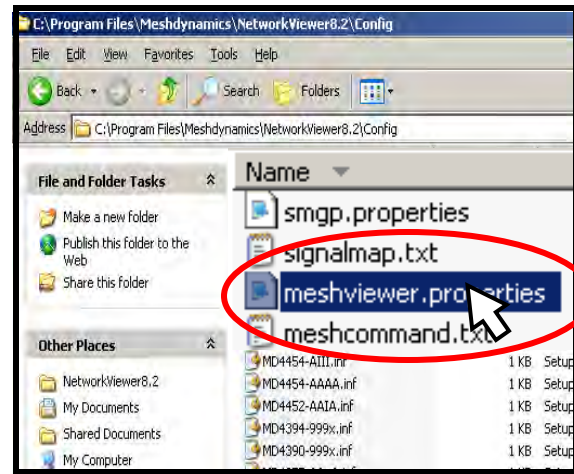
Name	Size	Type
AlertScripts		File Folder
Config		File Folder
Extensions		File Folder
Library		File Folder
Map		File Folder
Networks		File Folder
NodeFiles		File Folder
System		File Folder
SystemLogFiles		File Folder
Templates		File Folder
Updates		File Folder
Web		File Folder
help.bat	1 KB	MS-DOS Batch File
MD4000_NMSGUIDE.pdf	3,983 KB	Adobe Acrobat 7.0 .
MDRFEditorAddOn90.exe	352 KB	Application
NetworkViewer.bat	1 KB	MS-DOS Batch File
NetworkViewer.exe	312 KB	Application
uninstall-viewer.exe	344 KB	Application

## Instructions For Activation

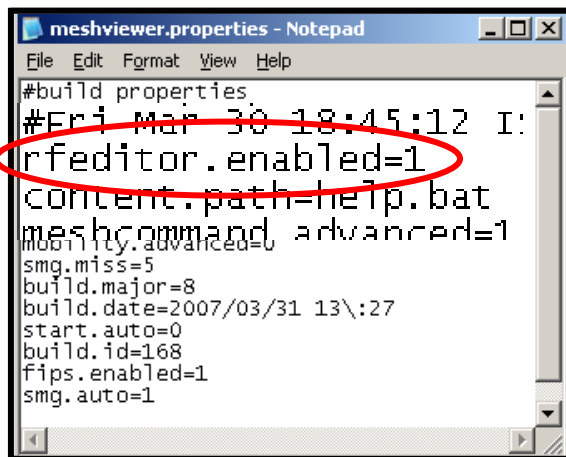
- 1** Go to the MeshDynamics software folder and select the “Config” folder.



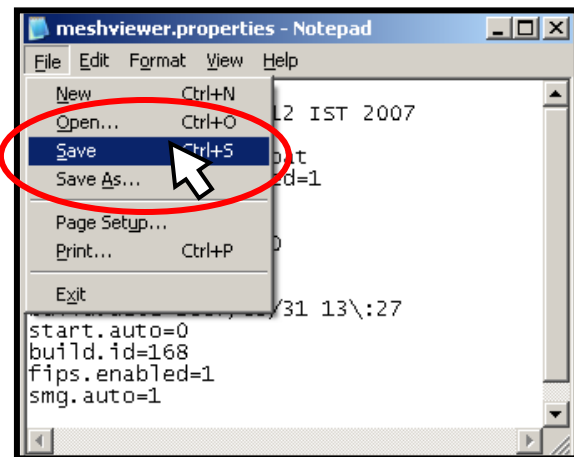
- 2** From inside the “Config” folder, select the “meshviewer.properties” file.



- 3** Edit the “smgp.properties” file as illustrated below  
..change”rfeditor.enabled=0”  
to “rfeditor.enabled=1”.



- 4** Save the file.



## Use of RF Editor

6

The RF Editor is now **active** (All channels created will appear on the Dynamic Channel Allocation (DCA) list under the “**Interfaces**” tab in the Node Configuration window).

A

The **RF Editor window** will allow the modification of each *radio* on the node.

B

Conformance options include FCC, ETSI, and MKK.

C

The factors of Transmit Power and Antenna Gain can be used to aid in conformance.

Node Configuration-00:12:ce:00:25:fa

General Interfaces Security VLAN ACL Ethernet Effstream **RF-Editor**

MD4350-AAIx

A. 5G Up Link (wlan1)

B. 5G Down Link (wlan0)

C. 2.4G Client AP (wlan2)

D.

Channel Width  5 MHz  10 MHz  20 MHz  40 MHz

Conformance

Max Power  dBm Max Antenna Gain  dBi

Channels

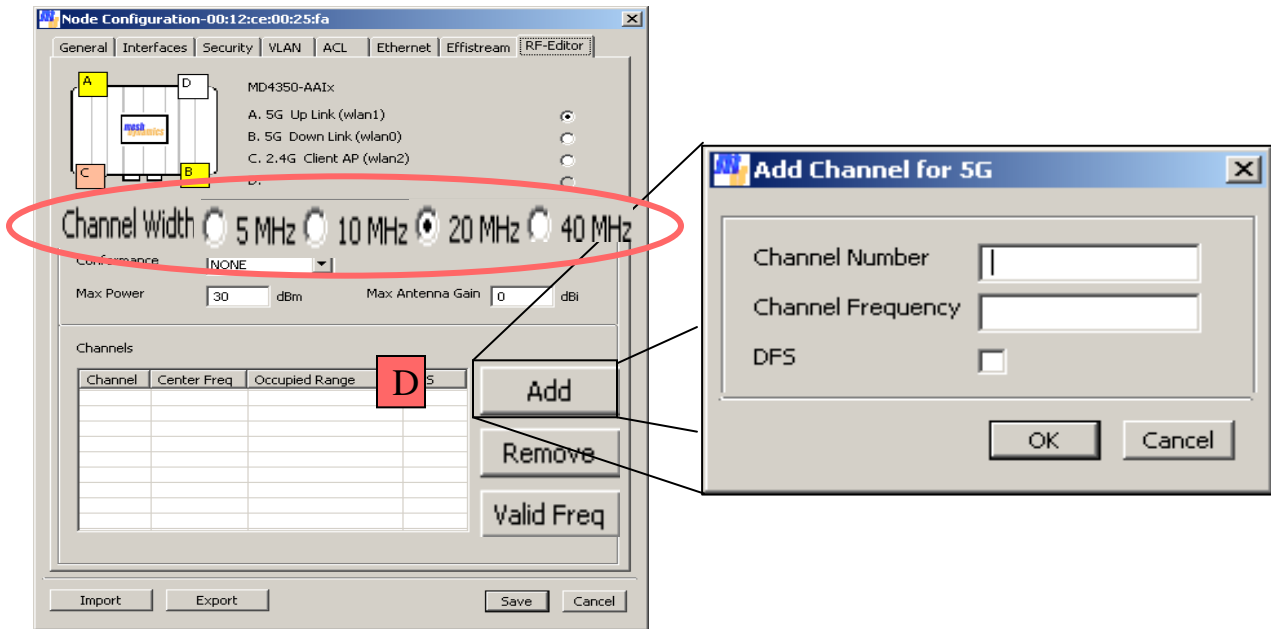
Channel	Center Freq	Occupied Range	DFS

Add Remove Valid Freq

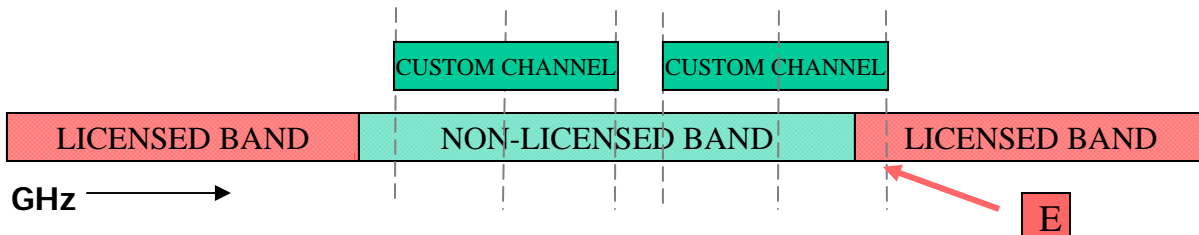
Import Export Save Cancel

## Use of RF Editor

- D** Custom channels must be assigned to the RF Editor. Click the “Add” button to define new channels. The Channel Number can be anything and is the option of the user to choose.
- E** Channel *Frequency* must be selected with discretion keeping in mind the selected Channel Width and the potential to *overlap* into licensed bands. Dynamic Frequency Selection (DFS) can be implemented with each created channel. It is to the user’s discretion whether or not to implement DFS.



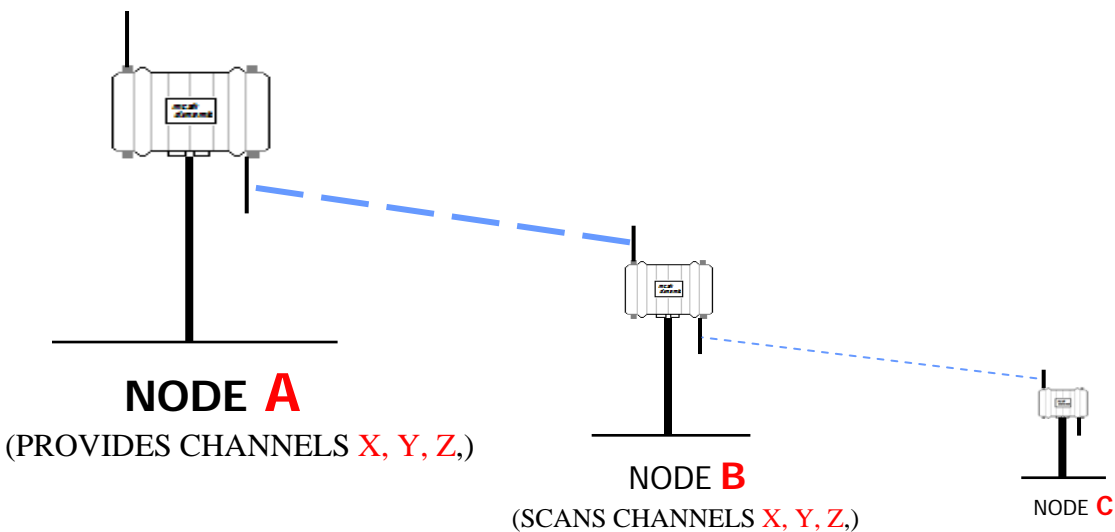
Channel Frequency can be chosen to fall within a non-licensed band, however, it is possible for the same channel to overlap into a non-licensed band if the Channel *Width* is wide enough. This must be considered when creating custom channels.



## Use of RF Editor

---

All created “custom” channels must be implemented across the backhaul in order for the mesh to function properly. In other words, node “B” will only scan the channels that were created on its uplink radio ...node “A” needs to provide those channels for node “B” to grab onto. This is the same situation between node “B” and node “C”. The RF Editor will overwrite the default 802.11a and 802.11b/g channel lists with the newly created channels.



## Trade-Off of Channel Width and Bandwidth

---

As a general rule, *the bandwidth of a link between two backhaul radios is proportional to the width (MHz) of the channel used for the link.* Using narrow channel widths can allow for the creation of more channels within a given band, and the use of more channels in a backhaul can help avoid interference *within* the backhaul, but there is a balance between number of channels used and bandwidth of the overall backhaul path.

## Radio Card Limitations

---

When using the MeshDynamics RF Editor, it is important to consider the physical capabilities of the radio cards involved with the created channel(s).

Wistron DCMA-82 radio cards are used in the MD4000 mesh node. Below is a list of supported frequencies for both radio cards.

<b>WISTRON DCMA-82</b>
<b>2.400-2.483GHz</b>
<b>4.940-4.989GHz</b>
<b>5.150-5.350 &amp; 5.470-5.850GHz</b>

The *center frequencies* of each created “custom” channel must be far enough from the edges of the functional operating bands as to account for the assigned channel widths of the created channels.

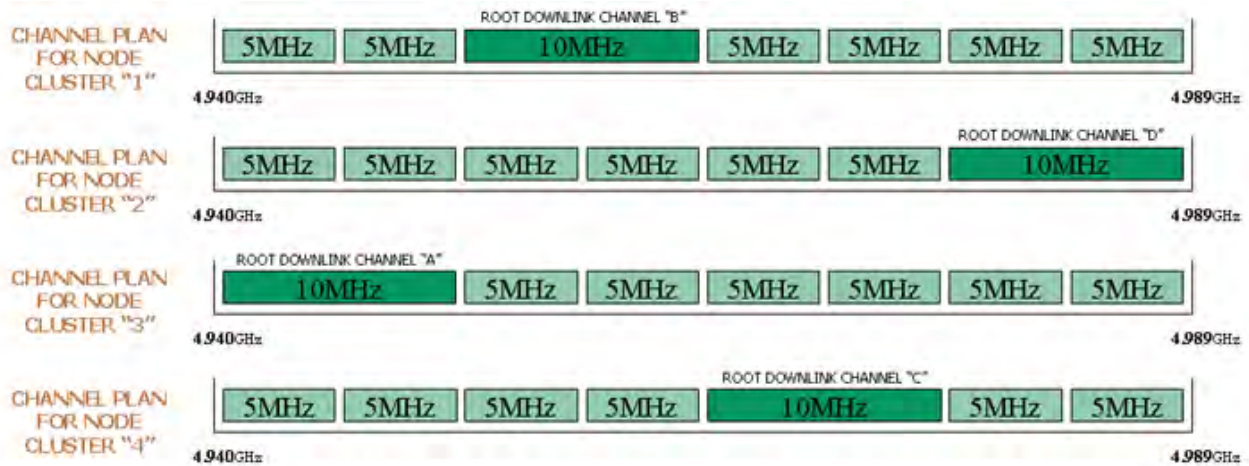
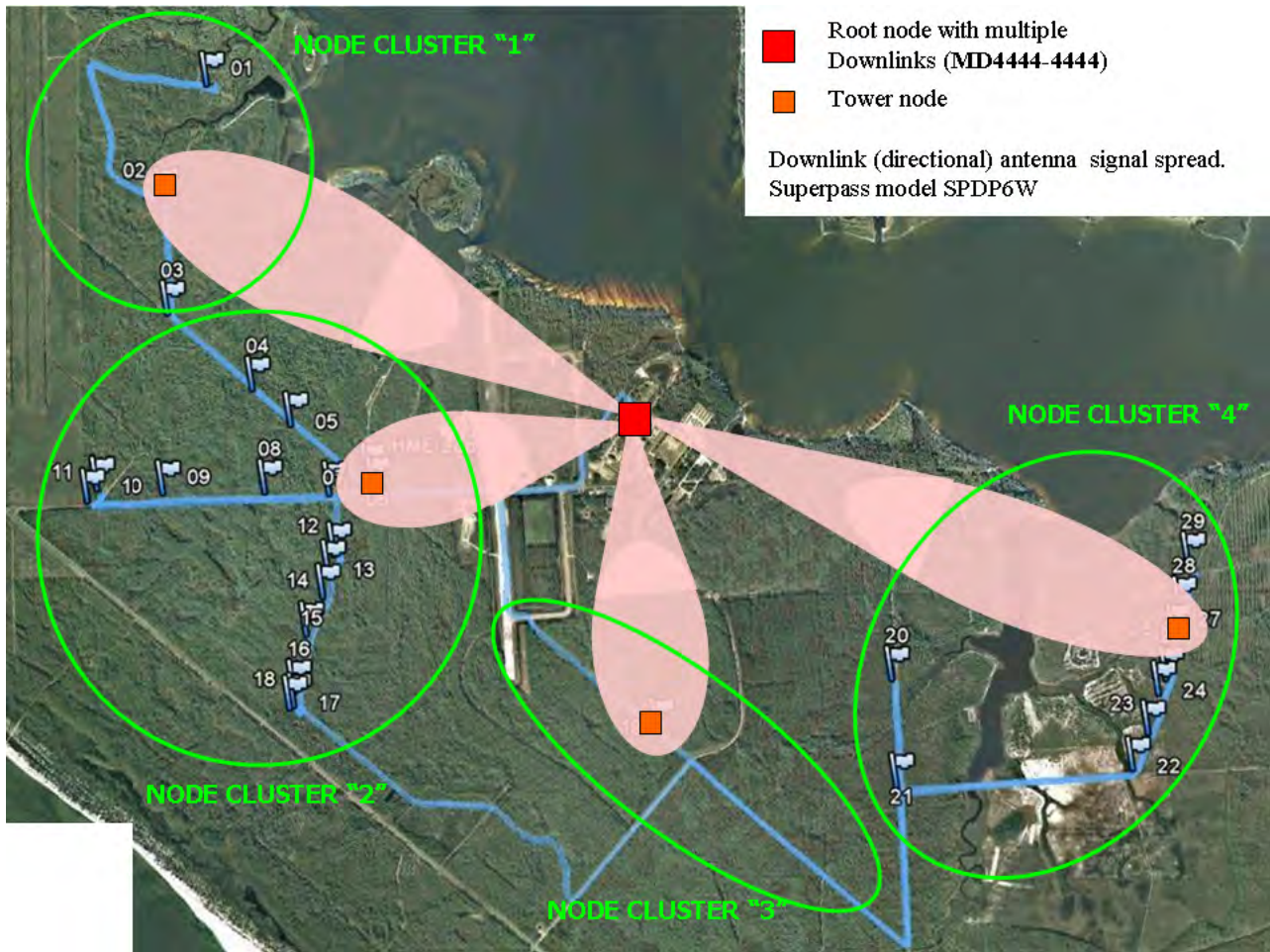


## 4.9GHz Channel Usage

---

CHANNEL WIDTH	CHANNEL NUMBER	CENTER FREQUENCY (MHz)
<b>20MHz</b>	20	4950
	30	4955
	40	4960
	50	4965
	60	4970
	70	4975
	80	4980
<b>10MHz</b>	10	4945
	20	4950
	30	4955
	40	4960
	50	4965
	60	4970
	70	4975
	80	4980
<b>5MHz</b>	5	4942
	15	4947
	25	4952
	35	4957
	45	4962
	55	4967
	65	4972
	75	4977
	85	4982
	95	4987

# Example of Channel Width Setting for 4.9GHz



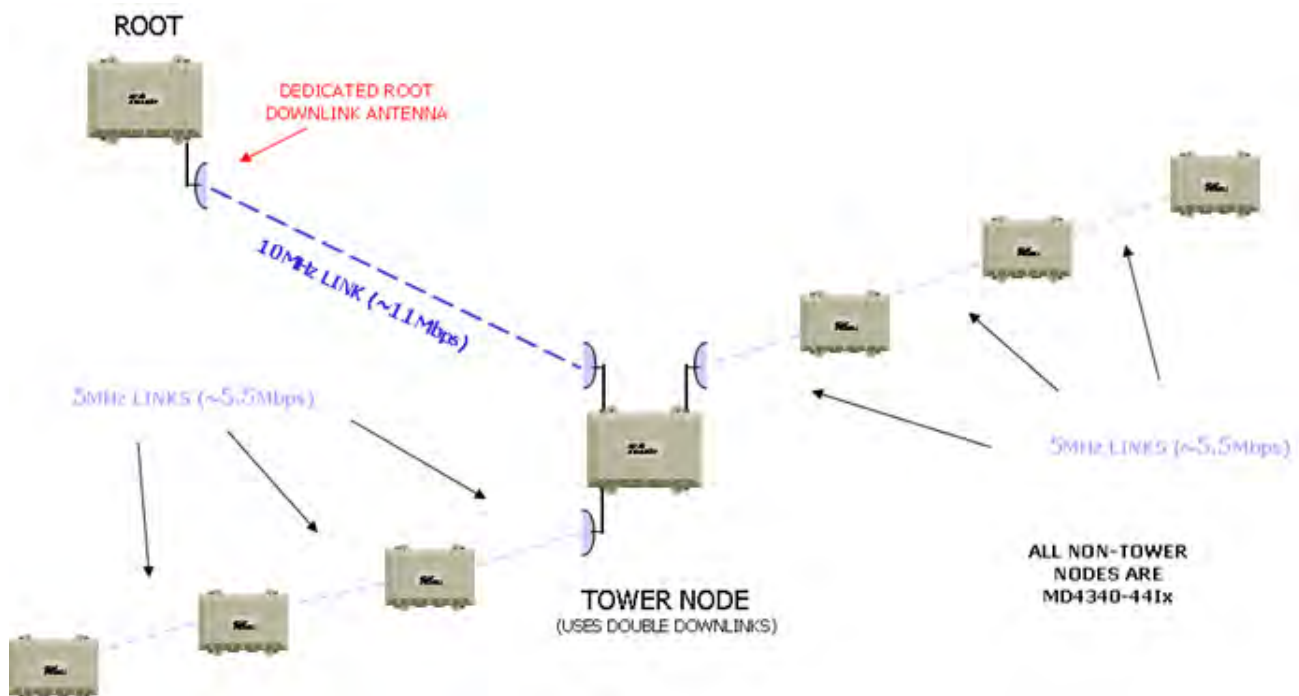
## Node Cluster #4

# Individual Node Clusters

The *tower node* of the #4 cluster will use double downlink radios to distribute the ~11Mbps it is receiving from the root node. It will distribute the bandwidth in two opposite directions; 5.5Mbps in one direction, and 5.5Mbps in the other direction.

This distribution will help each node in the cluster get a fair share of the available 11Mbps coming from the root node.

The tower node should be placed in the middle of the node cluster such that there is an equal number of child nodes feeding off of each of the downlinks. This concept should be implemented in clusters #1 and #3.



## Node Cluster #2

# Individual Node Clusters

The *tower node* of the #3 cluster will use *triple* downlink radios to distribute the ~11Mbps it is receiving from the root node. It will distribute the bandwidth in three directions. Each of the downlinks on the tower node will operate on 5MHz channels.

Although there will not be enough bandwidth coming from the root node to fill each of the three branches to the 5.5Mbps capacity, this will still provide the best distribution of the available bandwidth.

The tower node should be placed in the location of the #6 or #7 node –such that it will be able to hit all three branches of the cluster.

