SkyMesh-MIMO
Fixed & Mobile wireless solution

HYC-N1051C-53
20 km No LOS Wireless Field Performance
BS setup: HYC-N1051C-53 with 26dBi MIMO panel embedded

Remote setup: HYC-N1051C-53 with 26dBi MIMO panel embedded
Test Equipment at each site
  - Hypercable HYC-N1051C-53, with 26dBi MIMO panel embedded

Purpose of Trial
1. To obtain link performance of HYC-N1051C-53 under high Noise Floor areas
2. To prove the high spectral efficiency & resistance of narrow channel bandwidth in highly congested area.

Sites Condition
- Both selected sites are highly congested with 5GHz noise over a City with an average Noise Floor exceed -70dBm.

Note: Features of Narrower Channel Bandwidth of SkyMesh-MIMO
- Easier to find out available spectrum range to allocate operating channels under congested area
- The narrower channel size, the lower minimum SNR value
HYC-N1051C-53
20 km PTP Link Site Condition

20 km distance Point to Point in congested Paris City
Environmental Noise Spectrum Analysis @ BS Site

-75dBm noise floor average (Yellow line)
-74dBm peak noise (Purple line)
Testing spectrum range 5300+/- 25MHz
HYC-N1051C-53
20 km PTP Link Site Setup

Environmental Noise Spectrum Captured @ Remote Site

-78dBm noise flow average (Yellow line)
-74dBm peak noise (Purple line)
Testing spectrum range 5300+/- 25MHz
Performance of HYC-N1051C-53, 26dBi MIMO Panel antenna embedded over 20 km:

<table>
<thead>
<tr>
<th>Channel BW</th>
<th>5MHz</th>
<th>10MHz</th>
<th>20MHz</th>
<th>40MHz</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSSI (field)</td>
<td>-68 ~ -71dBm</td>
<td>-68 ~ -71dBm</td>
<td>-70 ~ -73dBm</td>
<td>-70 ~ -73dBm</td>
<td></td>
</tr>
<tr>
<td>Modulation (Expected)</td>
<td>64QAM5/6</td>
<td>64QAM5/6</td>
<td>64QAM2/3</td>
<td>64QAM2/3</td>
<td>RSSI @ 1% error rate</td>
</tr>
<tr>
<td>Modulation (Actual)</td>
<td>64QAM5/6</td>
<td>64QAM5/6</td>
<td>64QAM2/3</td>
<td>16QAM3/4~64 QAM2/3</td>
<td>Noise Floor Level: -70 ~ -75dBm</td>
</tr>
<tr>
<td>Throughput (Expected)</td>
<td>23Mbps</td>
<td>50Mbps</td>
<td>80Mbps</td>
<td>120 ~ 160Mbps</td>
<td></td>
</tr>
<tr>
<td>Throughput (Actual)</td>
<td>23Mbps (As expected)</td>
<td>50Mbps (As expected)</td>
<td>86Mbps (As expected)</td>
<td>131Mbps (As expected)</td>
<td>Noise Floor Level: -70 ~ -75dBm</td>
</tr>
</tbody>
</table>

Graph showing terrain and distance:
- Minimum: 20.16 m
- Maximum: 173 m
- Distance: 20.2 km
- Elevation: 225 m, 366 m
- Slope: 3.2% - 5.4%
- Steepness: 1.9% - 2.2%
### 5GHz Radio Performance

<table>
<thead>
<tr>
<th>Distance</th>
<th>30KM</th>
<th>40KM</th>
<th>50KM</th>
<th>Environment Noise Flood</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenna Type</td>
<td>30dBi MIMO Dish – ANT5030D-P</td>
<td>30dBi MIMO Dish – ANT5030D-P</td>
<td>30dBi MIMO Dish – ANT5030D-P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel BW</td>
<td>20MHz</td>
<td>20MHz</td>
<td>10MHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. SNR</td>
<td>18 ~ 20dBm</td>
<td>18 ~ 20dBm</td>
<td>12 ~ 15dBm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RSSI</td>
<td>-68 ~ -71dBm</td>
<td>-71 ~ -73dBm</td>
<td>-73 ~ -76dBm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Throughput 1</td>
<td>90Mbps</td>
<td>80Mbps</td>
<td>40Mbps</td>
<td>NF = -90dBm</td>
<td>Rural area</td>
</tr>
<tr>
<td>Throughput 2</td>
<td>70Mbps</td>
<td>60Mbps</td>
<td>30 ~ 40Mbps</td>
<td>NF = -70 ~ -75dBm</td>
<td>Congested area</td>
</tr>
</tbody>
</table>

- Narrower channel bandwidth require lower SNR to operation. Better performance in highly crowded area can be expected.
- The values of both throughput1 and throughput2 is for different ambient noise level.
- The table is for LOS applications.