**The Evolution of LTE to 5G**

Comparing the Speeds and Features

<table>
<thead>
<tr>
<th>Speed</th>
<th>Cat-3</th>
<th>Cat-6</th>
<th>Cat-9</th>
<th>Cat-11</th>
<th>Cat-12</th>
<th>Cat-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downlink</td>
<td>100Mbps</td>
<td>300Mbps</td>
<td>450Mbps</td>
<td>600Mbps</td>
<td>600Mbps</td>
<td>1Gbps</td>
</tr>
<tr>
<td>Uplink</td>
<td>50Mbps</td>
<td>50Mbps</td>
<td>50Mbps</td>
<td>75Mbps</td>
<td>150Mbps</td>
<td>150Mbps</td>
</tr>
<tr>
<td>QAM</td>
<td>64</td>
<td>64</td>
<td>64</td>
<td>64</td>
<td>256</td>
<td>256</td>
</tr>
</tbody>
</table>

**Features**

<table>
<thead>
<tr>
<th>Cat-3</th>
<th>Cat-6</th>
<th>Cat-9</th>
<th>Cat-11</th>
<th>Cat-12</th>
<th>Cat-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTE-LAA (5GHz)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CBRS (3.5GHz)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Public Safety</td>
<td>-</td>
<td>-</td>
<td>Band 14 for FirstNet™, Bands 20 &amp; 28 for Europe</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Gigabit LTE speed is achieved by combining all these technologies.**

**How does LTE achieve 1Gbps speed?**

The technology enabling the data super highway (where passenger = data)

- **Carrier Aggregation** is like adding a highway
- **Unlicensed Band** is like moving some traffic to parallel service roads
- **4x4 MIMO** is like adding a highway on top of a highway

Additional speed boost on unlicensed bands

- Ability to set up local private networks
- LTE-A Pro modules
- Enables public safety networks (i.e. FirstNet™, ESN, PC STORM, ASTRID)

**FACTS about the world’s first LTE-A Pro modules**

- The last 4G technology jump before 5G
- For this example, think of baseline LTE technology as a single highway with standard-size cars traveling on it.

- **10X** faster downlink speeds
- **3X** faster uplink speeds
- **4X QAM speed boost**
- **Additional speed boost on unlicensed bands**
- **Ability to set up local private networks**

For more information, visit sierrawireless.com

**The use-cases for LTE-Advanced Pro**

- **Retail applications**
- **Public safety networks**
- ** Lose HD video broadcasting**
- **Road warfighter capability**

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