MaGiC-SFP™ Introduction

“Put some MaGiC in your network.”
All of the market conditions are in place, yet one problem persists:

How to efficiently distribute reliable bandwidth into brownfield buildings at low cost.

• Increasing 5G and wireless point-to-point to building entry points.
• Fiber and Ethernet are not always a practical or economical option.
• Growing need for wireless LAN backhaul in both buildings and in homes.
• Massive growth of streaming services and smart devices.
MaGiC-SFP™ minimizes the challenges to distributing bandwidth over the last 300ft on the WAN side of the network and wireless backhaul of the LAN side of the network.

- MaGiC-SFP™ offers up to 2.5Gbps of symmetrical data.
- Plugs into SFP cage found in gateways, ONU’s, Ethernet switches, APs and media converters, that support 1000BaseT/SGMII. SFP/+ must support two watts.
- Simple to install, fast to deploy, highly reliable.
- No management software.
MaGiC SFP: Multi Gigabit Coaxial - Small Form-Factor Pluggable

- Follows the SFP/SFP+ standards and is a pluggable module that fits into any existing network that uses coax.
- Transports data at fiber speeds: 2.5Gbps.
- Massively less expensive and dramatically reduced install time compared with rewiring an existing building with new fiber.
- Uses MoCA® Access™ 2.5 industry standard.

Product - MaGiC-SFP™
MaGiC SFP eliminates need to pull fiber to last unit.

<table>
<thead>
<tr>
<th>Unit 1</th>
<th>Unit 2 WiFi Router</th>
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<tbody>
<tr>
<td>Unit 2 WiFi Router</td>
<td>Unit 3 WiFi Router</td>
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<tr>
<td>Unit 3 WiFi Router</td>
<td>Unit 4 WiFi Router</td>
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</tbody>
</table>

**Single Mode Fiber**

**Electronics or Splitter Cabinet**

**MoCA SFPs & RG6 Coax**

**Bare Metal 4/8/16/24 Port GigE Switch**

**Point-to-point Ethernet**
- PON ONT uses SFP port to support any number of transport mediums within the home.
  - Cat5, coax, fiber
- Gateways and APs with SFP+ port can connect in mesh mode to all other devices at 2.5G using MaGiC SFP™.
  - No wireless mesh “dead zones.”
  - No new wiring needed.
MaGiC SFP™ with growing portfolio of SFP+ CPE
• Last 100M access over existing coax building wiring.
  • Any High-Speed distribution to the building with final distribution using in-building coax.
    • Co-exists with existing cable or satellite operator’s installation.
    • supports 1:15 users

• In-premise network distribution.
  • Using simple low cost SFP+ based CPE, operators can support ANY transmission medium in the home without having to purpose build it.

• Wireless AP backhaul in-premise.
  • Migration to a complete wireless mesh installation is accelerating, but there will always be homes with “problem areas” where wireless mesh/backhaul of the access point’s traffic simply does not work.
    • Using WAPs with SFP+ ports, operators can backhaul the traffic with MaGiC SFP™ at speeds up to 2.5G in either direction.

• Hospitality/commercial WAP backhaul and powering.
  • Using standalone power injectors, a single, low-cost SFP/SFP+ based Ethernet switch combined with the MaGiC SFP provides both data and power to remote APs in hallways, hotel rooms, public spaces and meeting rooms.

• Point-to-point (P2P) building-to-building or in-building.
  • Using two media converters with two MaGiC SFP’s to deliver 1Gbps in a point-to-point application.
<table>
<thead>
<tr>
<th>Transmission Medium</th>
<th>Speeds</th>
<th>Numbers of Existing Deployments</th>
<th>Cost to Install</th>
<th>Supporting Technology</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-4 wire copper twisted Pair</td>
<td>&lt;1G</td>
<td>High</td>
<td>$100/Unit</td>
<td>DSL, G.fast, phone – streaming not supported.</td>
<td>Most Telecom companies began Internet access using this medium and achieved a foothold prior to cable modem technology.</td>
</tr>
<tr>
<td>8 wire copper twisted pair (Cat5/6)</td>
<td>10G</td>
<td>Low (35% of existing Buildings)</td>
<td>$150/Unit</td>
<td>Ethernet</td>
<td>Primarily used in commercial buildings and data centers with recent construction now including this to units.</td>
</tr>
<tr>
<td>Coax</td>
<td>10G</td>
<td>High (Nearly 100%)</td>
<td>$100/Unit</td>
<td>RF, DOCSIS, MoCA</td>
<td>Installed since early cable distribution days. Cable modem technology has since used this to take the lions share of all Internet access due to its high speeds and longevity.</td>
</tr>
<tr>
<td>Fiber</td>
<td>400G</td>
<td>Very Small</td>
<td>$200/Unit</td>
<td>Ethernet, PON, ATM, FDDI</td>
<td>Installed in data centers and some commercial buildings and long haul transmission avenues. High value residential buildings are starting to see fiber as part of the construction.</td>
</tr>
<tr>
<td>Wireless</td>
<td>1G+</td>
<td>High</td>
<td>$0</td>
<td>Wi-Fi, fixed wireless, 3G/4G/5G</td>
<td>Wireless technologies continue to evolve from several megabits to 1Gpbs. However wireless transmission can be impeded due to interference and number of devices even within a single residential unit creating rooms or areas where wireless performs poorly.</td>
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</tbody>
</table>
MaGiC-SFP™ Tree Diagram
• MaGiC SFP:
  • Requires no software.
  • Simple to install.
  • Offers the most bandwidth.
  • Only MoCA Access-based SFP/SFP+ solution over coaxial cable.
  • Available now.