

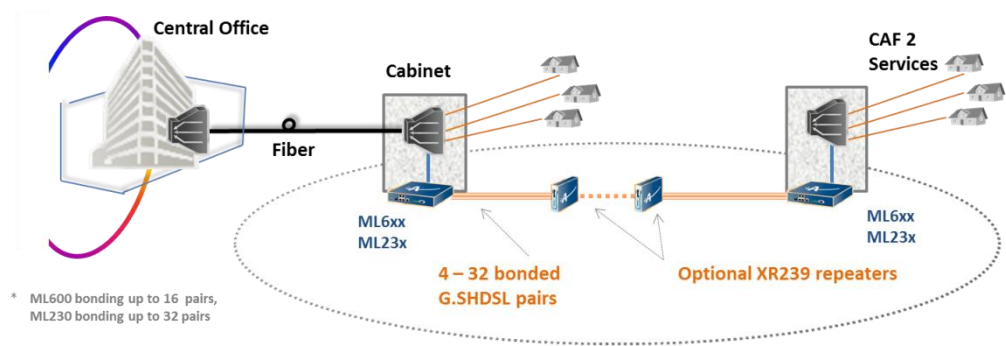
# Reach More Customers, Offer High Speed Services More Cost Effectively With Reliable, Scalable DSLAM Backhaul Over Copper

Actelis Networks' broadband over copper DSLAM backhaul solutions help carriers transform their existing DSL network to cost effectively support the escalating demand for higher bandwidth services. Placing smaller IP DSLAMs closer to customers enhances performance, but a more cost effective backhaul solution than fiber is needed if service operators are to do so and be profitable as well as competitive. DSLAMs in the installed base may not need moved, but may still need upgraded from NxT1 to higher speed IP backhaul to increase capacity, and also require a reliable, cost effective and scalable solution.

Actelis' provides a more efficient way to backhaul DSL networks of any size. Our field-proven reliability, broad and flexible portfolio of G.SHDSL and VDSL2 bonded copper with fiber support and CWDM options support diverse topologies, enabling operators to increase service data rates, take advantage of government CAF Phase I and II programs, reduce churn and enhance profitability. Leveraging copper is essential to cost optimizing and accelerating DSLAM backhaul network builds, and Actelis gives operators ultra reliable broadband over copper, the flexibility to use fiber where they have it and gracefully migrate from copper to fiber in future where and when needed.

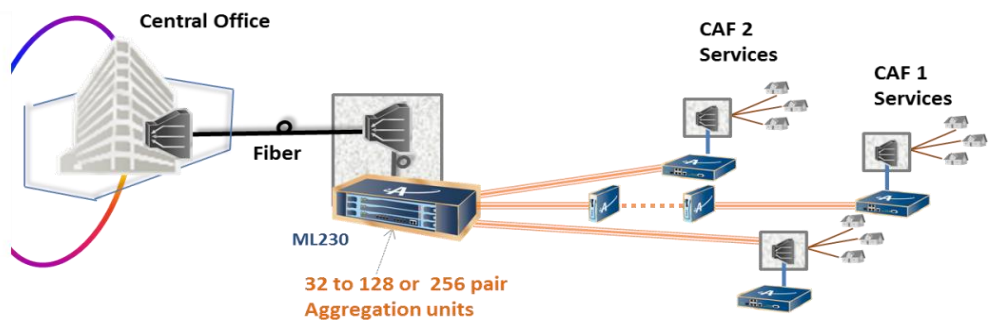
## Point-to-point Bonded G.SHDSL

- Bonding up to 32 pairs
- Backhaul 100+ Mbps
- Extended reach with repeaters



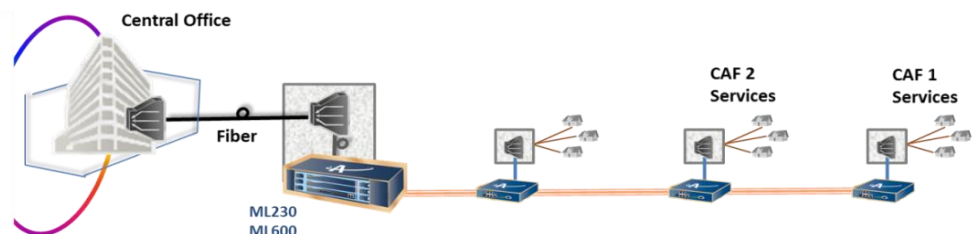
## Point-to-multi-point bonded G.SHDSL

- Cost effective aggregation for multiple smaller DSLAMs (e.g. urban area)
- Bonding up to 32 pairs
- Backhaul 100+ Mbps
- Extended reach with repeaters



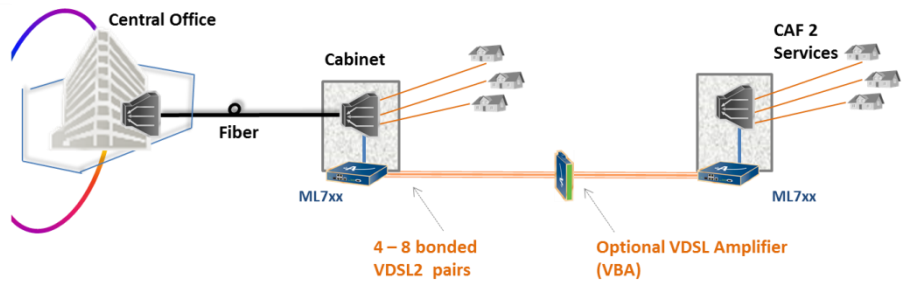
## Drop & Continue bonded G.SHDSL

- Cost effective downstream BW distribution for multiple smaller DSLAMs over limited # of pairs



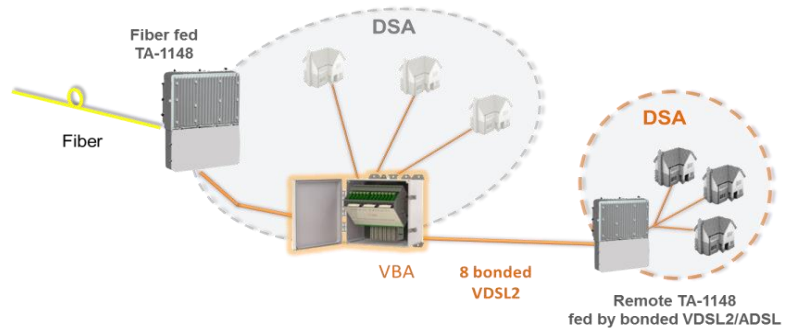
**Point-to-point Bonded VDSL2**

- Backhaul 100s of Mbps
- Bonding of up to 8 pairs
- Extended reach with Actelis' VDSL Broadband Amplifier (VBA)



**Remote TA-1148 fed by a bonded DMT (VDSL/ADSL) link**

- Actelis VBAs enhance backhaul capacity



**Actelis' DSLAM Backhaul Solution Advantages and Benefits**

<b>Reliable, Cost Effective, Quick to Deploy Backhaul Capacity</b>	<ul style="list-style-type: none"> <li>• <b>Link performance optimization</b> 100s of Mbps of backhaul; Field-proven reliability requiring less capital and time to deploy than fiber; More bandwidth, distance, reliability than competing copper-based solutions</li> </ul>
<b>Various Topologies</b>	<ul style="list-style-type: none"> <li>• Point-to-point, Point-to-Multi-Point, Drop and Continue</li> </ul>
<b>Symmetrical or Asymmetric Backhaul</b>	<ul style="list-style-type: none"> <li>• <b>Bonded G.SHDSL</b> - symmetrical backhaul for medium to very long reach. <b>Bonded VDSL2 (DMT)</b> - asymmetrical backhaul maximizing downstream bandwidth, typically used for short to medium reach.</li> </ul>
<b>High Capacity Bandwidth well over 100 Mbps</b>	<ul style="list-style-type: none"> <li>• Bonding 4-32 pairs with G.SHDSL - <b>Up to 400 Mbps</b> over 32 pairs, Up 120 Mbps over 8 pairs Bonding 4-8 pairs with VDSL2 - <b>Up to 260 Mbps</b> DS over 8 pairs</li> </ul>
<b>Flexibility</b>	<ul style="list-style-type: none"> <li>• Cost optimized choices of copper and fiber solutions; ability to migrate from copper to fiber when and if needed without changing hardware</li> </ul>
<b>Extended reach</b>	<ul style="list-style-type: none"> <li>• 8 repeater hops per G.SHDSL bonded links – 40 Mbps / 45 kft - 26 AWG, 70 Kft -22 AWG</li> <li>• VBA/ABA per VDSL2 links</li> </ul>
<b>High Reliability, High QoE</b>	<ul style="list-style-type: none"> <li>• Ruggedized, high MTBF, solutions enabling high QoE for subscribers</li> </ul>
<b>Flexible and Easy Installations</b>	<ul style="list-style-type: none"> <li>• Compact for cabinet installation, IP68 enclosures for Wall/pole mount</li> </ul>
<b>Remote Powering option</b>	<ul style="list-style-type: none"> <li>• Express powering as well as local AC or DC powering</li> </ul>
<b>Flexible interfaces</b>	<ul style="list-style-type: none"> <li>• Optical SFP ports, 10/100/1000base T interfaces</li> </ul>
<b>Comprehensive Management</b>	<ul style="list-style-type: none"> <li>• Actelis MetaASSIST™ View and EMS management solutions</li> </ul>
<b>Full Layer 2 functionality</b>	<ul style="list-style-type: none"> <li>• CE 2.0 compliant models</li> </ul>
<b>Purpose Build for Task</b>	<ul style="list-style-type: none"> <li>• Highly versatile form factors</li> </ul>
<b>Spectrally Compliant</b>	<ul style="list-style-type: none"> <li>• T1.417 compliance plus DSS noise reduction technology</li> </ul>