Broadband Forum
G-PON ONU Certification Program

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Broadband Forum
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Architecting a connected lifestyle

- Defining best practices for global networks
- Enabling multi-service and content delivery
- Establishing technology migration strategies
- Engineering critical device & service management tools
- Redefining Broadband

Who are we?

- Industry consortium made up of approximately 200 service providers, vendors, consultants, academia and test labs
- Predominant broadband industry forum since 1994
- Engineer technology solutions to help service providers achieve standards based, economical and effective broadband deployments
## Broadband Growth Highlights

<table>
<thead>
<tr>
<th>Country</th>
<th>2010Q2</th>
<th>2010Q3</th>
<th>2010Q4</th>
<th>2011Q1</th>
<th>2011Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td><strong>498,215,161</strong></td>
<td><strong>512,718,518</strong></td>
<td><strong>528,187,210</strong></td>
<td><strong>543,766,633</strong></td>
<td><strong>557,802,149</strong></td>
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<tr>
<td>Net adds</td>
<td><strong>13,583,001</strong></td>
<td><strong>14,503,357</strong></td>
<td><strong>15,468,692</strong></td>
<td><strong>15,579,423</strong></td>
<td><strong>14,035,516</strong></td>
</tr>
<tr>
<td>China (all territories)</td>
<td><strong>120,591,488</strong></td>
<td><strong>126,688,298</strong></td>
<td><strong>131,447,883</strong></td>
<td><strong>137,919,667</strong></td>
<td><strong>144,334,839</strong></td>
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<tr>
<td>USA</td>
<td><strong>84,404,029</strong></td>
<td><strong>85,665,658</strong></td>
<td><strong>87,197,827</strong></td>
<td><strong>88,787,828</strong></td>
<td><strong>89,534,219</strong></td>
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<tr>
<td>Japan</td>
<td><strong>33,019,900</strong></td>
<td><strong>33,455,800</strong></td>
<td><strong>34,058,000</strong></td>
<td><strong>34,413,200</strong></td>
<td><strong>34,881,500</strong></td>
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<td>Germany</td>
<td><strong>25,733,200</strong></td>
<td><strong>26,114,350</strong></td>
<td><strong>26,655,350</strong></td>
<td><strong>27,238,450</strong></td>
<td><strong>27,699,450</strong></td>
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<td>France</td>
<td><strong>20,585,000</strong></td>
<td><strong>20,916,000</strong></td>
<td><strong>21,387,530</strong></td>
<td><strong>21,692,800</strong></td>
<td><strong>22,038,300</strong></td>
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<td>UK</td>
<td><strong>18,979,000</strong></td>
<td><strong>19,210,000</strong></td>
<td><strong>19,607,600</strong></td>
<td><strong>19,911,100</strong></td>
<td><strong>20,151,200</strong></td>
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<tr>
<td>South Korea</td>
<td><strong>16,789,947</strong></td>
<td><strong>16,980,061</strong></td>
<td><strong>17,224,102</strong></td>
<td><strong>17,399,028</strong></td>
<td><strong>17,675,311</strong></td>
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<tr>
<td>Brazil</td>
<td><strong>12,449,000</strong></td>
<td><strong>13,092,900</strong></td>
<td><strong>13,812,200</strong></td>
<td><strong>14,489,600</strong></td>
<td><strong>15,232,700</strong></td>
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<tr>
<td>Italy</td>
<td><strong>13,880,348</strong></td>
<td><strong>14,117,128</strong></td>
<td><strong>14,272,650</strong></td>
<td><strong>14,373,650</strong></td>
<td><strong>14,503,650</strong></td>
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<tr>
<td>Russia</td>
<td><strong>10,756,281</strong></td>
<td><strong>11,149,447</strong></td>
<td><strong>12,073,400</strong></td>
<td><strong>12,612,000</strong></td>
<td><strong>12,921,000</strong></td>
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Changing Access Technology Landscape

- FTTx (hybrid PON/DSL solution) is the most rapidly growing access deployment in most regions
- Fiber based deployments are growing at 19% annual growth
- Yet the demand for super fast broadband is still not being fully met by the Providers
G-PON interoperability is critical

Many strong market drivers:

- Facilitate competition and expedite growth, develop G-PON as an open technology
- Address various operators’ services (residential, business, mobile backhaul…) in multi-vendor environments
- Enable business models where the retail service provider may not operate the access network
Value to the Industry Players

To Service Providers
- Certification based on international standards aligned with architectures and protocols that reflect real world network requirements
- Assurance of protocol compliance allows service providers to dedicate resources to address their specific requirements
- Streamlined selection process; helps service providers identify & eliminate non-compliant devices quickly
- Standardized element of RFPs, thereby reducing service provider testing responsibility and expense
- Reduced time to market of new services, thereby improving Providers’ Return On Investment (ROI)

To the Vendor Community
- Simple cost effective formula: **Test once and reuse results!**
  - Shortens test cycles and saves testing resources/expense
- Way to establish a strong position in the global market
- Presents a strong quality indication for end customers
- Offers clear and robust test cases; better specifications, more efficient developments
Providers & Vendors Speak Out & Agree-
Certification benefits the industry & their companies

“This certification is key to speed up our FTTH deployments. It reduces dramatically the amount of specific testing needed before we choose and deploy new equipment. It will enable next generation systems to come to the market faster and with interoperability from day one.”

“Our customers wish to have highly integrated CPE (not separate ONU, router, ATA etc.) at a price and functionality point of their choosing. Certifying compliance to OD-247 greatly assists in meeting our customer's requirements for their preferred G-PON commercial and operating model.”

“Certifying compliance will enable us, as G-PON testing equipment manufacturers, to show the level of compliance of the OLT/ONUs that our customers would like to purchase.”

“A BBF G-PON certification program allows us to overcome hurdles of non-compliancy and enables us to enter labs in a much faster way.”

“Certifying compliance [to BBF.247] provides a higher level of confidence in interoperability when selecting and deploying new equipment for existing and greenfield networks.”

“Certifying compliance [to BBF.247] enables us to have the confidence to invest knowing that we are leveraging a worldwide volume supply of interoperable equipment from competing vendors.”
Key Standards efforts for G-PON interoperability

- Since 2009, FSAN and the Broadband Forum joined forces to create a competitive environment for G-PON
  - FSAN IOP Task Group in charge of Physical and TC layers
  - Broadband Forum Fiber Access Network Working Group in charge of upper layers
  - Began joint plugfests
  - Developed a G-PON conformance test suite (OD-247)

- All ingredients for true interoperability are now specified
  - TR-156 and TR-167 specify architecture and minimum functionalities that OLT and ONT/ONU must implement respectively
  - TR-142 specifies the boundary between OMCI and TR-069 domains for ONT management
  - OMCI Implementers’ Guide (G.Imp984.4) defines how exactly the OMCI protocol must be used to manage TR-156 ONT/ONU

To allow plug and play interoperability, G-PON systems MUST comply with the above standards!
G-PON ONU Certification Program is Launched

Expediting market deployment of fiber networks
Introducing the Broadband Forum’s latest addition to the BBF Certification Program

- Industry’s first G-PON certification program based on test plans developed by the Broadband Forum with support of FSAN and ITU-T
- Builds upon the successful interoperability plugfest program of FSAN and the BBF
- Open to G-PON ONU products with Ethernet interfaces and is based on the OD-247 test plan
- Tests conformance to TR-156 using OMCI as defined in the ITU G.988, which are the most critical standards to interoperable implementations
- ONUs with other types of interfaces/features will be addressed in the future
Announcing first certified products!
Below are the companies with a product certified

- Alcatel-Lucent
- Broadlight
- CIG (Cambridge Industries Group)
- Huawei
- PMC-Sierra
- PT Inovação
- Tecom

http://www.broadband-forum.org/CertifiedGPON.php
Program basics

- Program open to Broadband Forum members only
  - Certificate granted to compliant (passing all mandatory and conditional mandatory tests) products
  - Allowed to use BBF certification logo
  - Option for companies to have their certified products listed on Broadband Forum’s global registry

- Testing is available through approved independent testing agencies
  - Iometrix (based in USA and China)
  - LAN (based in France and China)
Timeline

- Beta testing - Done
- G-PON ONU test plan – Approved

- Open enrollment now
  - Contact the labs for details and timing
BroadbandSuite 5.0: Fiber related Architecture, Management and Market Requirements Specifications

- TR-142: Framework for TR-069 Enabled PON Devices
- TR-155: G-PON ONU Requirements for CPE
- TR-247: G-PON ONU Conformance Abstract Test Plan
- OD-247: G-PON ONU Conformance Test Plan
- WT-255: G-PON OLT/ONU Interoperability Test Plan
- PD-205: G-PON and XG-PON1 Management

Background:
- TR-101: Ethernet based aggregation for DSL access
- TR-069: CPE management protocol
New PON work at the Broadband Forum

- Newly Released! G-PON test plans
  - OD-247: G-PON ONU Conformance Test Plan
  - TR-247: G-PON ONU Abstract Test Plan

- G-PON testing work continues
  - OD-247 issue 2 : G-PON Conformance Test Plan
  - WT-255 : G-PON Interoperability Test Plan
  - PD-205 : G-PON Management

- ONUs with other types of interfaces/features will be addressed in the future.
  - XG-PON1 is already covered by TR-142i2, TR-156i2 and TR-167i2
Partner organizations for PON related work

- FSAN: [http://fsanweb.com](http://fsanweb.com)
- HGI: [http://www.homegatewayinitiative.org](http://www.homegatewayinitiative.org)
- ITU-T: [http://www.itu.int/ITU-T](http://www.itu.int/ITU-T)
Questions?
Thank you for attending

For more information, visit us at
http://www.broadband-forum.org