

Broadband Forum G-PON ONU Certification Program

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Broadband Forum

Engineering smarter & faster connections

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

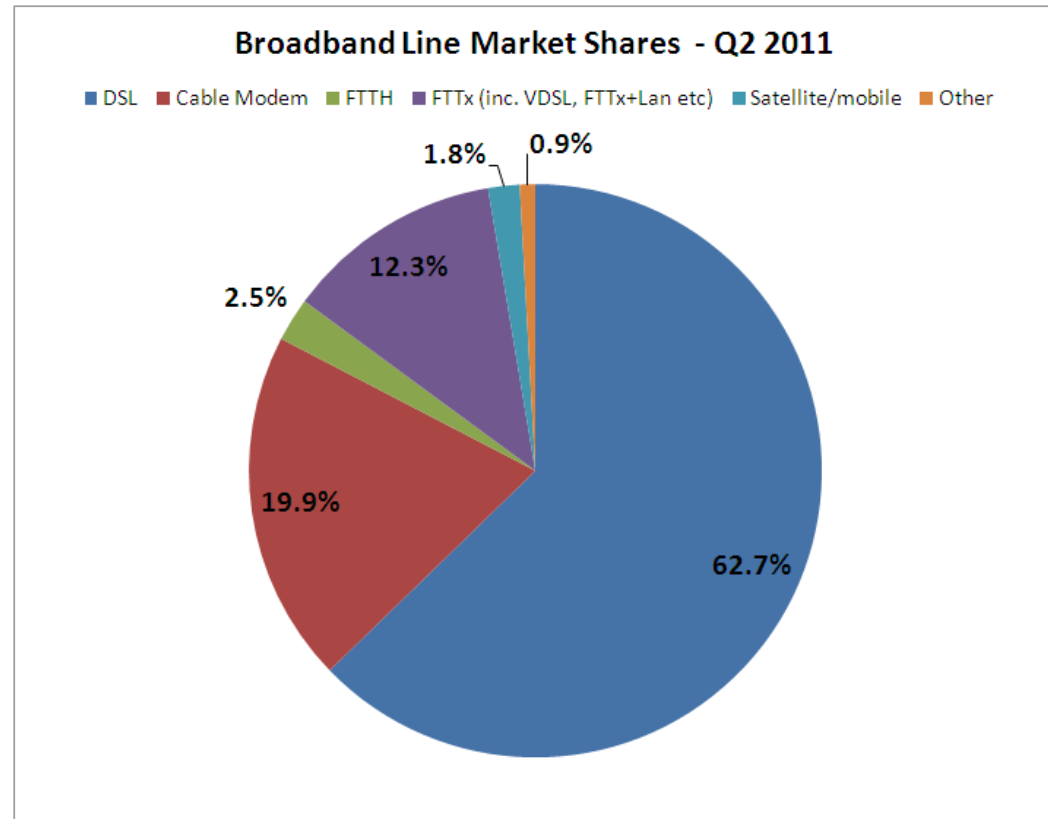
Broadband Growth Highlights

Broadband Lines and net additions	2010Q2	2010Q3	2010Q4	2011Q1	2011Q2
Total	498,215,161	512,718,518	528,187,210	543,766,633	557,802,149
Net adds	13,583,001	14,503,357	15,468,692	15,579,423	14,035,516

Country	2010Q2	2010Q3	2010Q4	2011Q1	2011Q2
China (all territories)	120,591,488	126,688,298	131,447,883	137,919,667	144,334,839
USA	84,404,029	85,665,658	87,197,827	88,787,828	89,534,219
Japan	33,019,900	33,455,800	34,058,000	34,413,200	34,881,500
Germany	25,733,200	26,114,350	26,655,350	27,238,450	27,699,450
France	20,585,000	20,916,000	21,387,530	21,692,800	22,038,300
UK	18,979,000	19,210,000	19,607,600	19,911,100	20,151,200
South Korea	16,789,947	16,980,061	17,224,102	17,399,028	17,675,311
Brazil	12,449,000	13,092,900	13,812,200	14,489,600	15,232,700
Italy	13,880,348	14,117,128	14,272,650	14,373,650	14,503,650
Russia	10,756,281	11,149,447	12,073,400	12,612,000	12,921,000

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-compliance 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

PMC - SIERRA



INOVAÇÃO



TECOM

Converging Your Networks

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-156 : Using G-PON Access in the Context of TR-101
- TR-167 : G-PON-fed TR-101 Ethernet Access Node
- 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

Work in progress

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>
- HGI: <http://www.homegatewayinitiative.org>
- IEEE: <http://www.ieee.org>
- ITU-T: <http://www.itu.int/ITU-T>

**Questions?
Thank you for attending**

For more information,
visit us at

<http://www.broadband-forum.org>

