Broadband Forum

2012
Annual Report

*"Innovation fuels the engine room of the Broadband Forum,
and it is this forward thinking, delivery and agility
that enable broadband to evolve at the speed of life
to meet an ever changing landscape of rich opportunities."*

— Kevin Foster,
President Broadband Forum

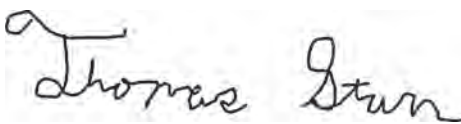# CHAIRMAN'S LETTER

Dear Broadband Forum colleague,

Reflecting on the past year, we appreciate the remarkable body of work that the members of the Broadband Forum have accomplished. Highlights include 34 approved technical reports, a new release "BroadbandSuite 6.0: 4G/LTE Ready Mobile Backhaul", the launch of the BBF.069 CPE Certification program, new G-PON Certification products and the advancement of the Broadband Forum's end-to-end multiservice architecture specifications.

With the ITU-T recently approving G.9980, which includes an official recommendation of TR-069, 2012 will be remembered in the industry for the key advances in TR-069 CPE WAN Management Protocol, the launch of the Broadband Forum's BBF.069 CPE Certification Program and as the year ended we received the prestigious InfoVision Award for "Outstanding Contributions to Broadband Success" for our work surrounding the TR-069 family of specifications. I congratulate the companies with the first devices to achieve BBF.069 certification – ActionTec, Broadcom, Cisco Systems, D-Link, Huawei Technologies and Lantiq.

We have also started new initiatives and a new working group that I am personally very excited about. Chartered to drive medium to long term innovation in broadband, we have launched the Service Innovation and Market Requirements WG (SIMR), which will be focused on the early identification and addressing of future business requirements, as well as potential enablers and disruptors, the Forum will drive interoperability and expedite the next wave of innovation in the broadband industry. Work has now started on assessing the impact of Cloud, Virtualization and Software Defined Networks (SDN) on broadband deployments.

With gratitude to our members for their continued support, we celebrate this year of accomplishments, and look forward with anticipation of the challenges that 2013 will bring. From FTTdp to Network Enhanced Residential Gateways, Policy Convergence to Multi-service Architecture and Nodal Requirements – the coming year is already loaded with essential industry initiatives.

Sincerely,

Tom Starr
Chairman
The Broadband Forum

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FORUM LEADERSHIP

Board of Directors

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COMMITTEE LEADERSHIP

The work of the Broadband Forum is performed under two main working committees, the Technical Committee and the Marketing Committee and a special advisory group, the Service Provider Action Council (SPAC). In 2012, a joint Technical and Marketing working group was also formed, the Service Innovation and Market Requirements working group.

Technical Leadership Team	
Technical Committee Chair: Christophe Alter, *France Telecom*	**Technical Committee Vice Chair:** Frank Van der Putten, *Alcatel-Lucent*
BroadbandHome Co-Chairs: John Blackford, *Pace* Jason Walls, *QA Café*	
End to End Architecture Co-Chairs: David Thorne, *BT* Dave Allan, *Ericsson*	**End to End Architecture Vice Chair:** Sven Ooghe, *Alcatel-Lucent*
Fiber Access Network Co-Chairs: Regis Coat, *France Telecom* Alessandro Capurso, *Telecom Italia*	
IP/MPLS & Core Co-Chairs: David Sinicrope, *Ericsson* Charles A. Rexrode II, *Verizon Communications*	
Metallic Transmission Chair: Les Brown, *Lantiq*	**Metallic Transmission Vice Chairs:** Massimo Sorbara, *Ikanos Communications* Lincoln Lavoie, *UNH InterOperability Laboratory*
Operations & Network Management Chair: Peter Adams, *ADTRAN*	**Operations & Network Management Vice Chair:** Moti Morgenstern, *ECI Telecom*
Chief Editor: Michael Hanrahan, *Huawei Technologies*	

Marketing Leadership Team

Marketing Committee Chair:
Yue Chen, *Juniper Networks*

Marketing Committee Vice Chair:
Sultan Dawood, *Cisco Systems*

Chair of International Development:
Nikhil Shah, *Juniper Networks*

Summit Chair:
Dov Zimring, *Google, Inc.*

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Dov Zimring, *Google, Inc.*

Ambassadors Vice Chair:
David Christophe, *Alcatel-Lucent*

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White Papers Acting Chair:**
Yue Chen, *Juniper Networks*

**Content Development –
Tutorials Chair:**
David Christophe, *Alcatel-Lucent*

Service Innovation & Market Requirements Leadership Team

SIMR Co-Chairs:
George Dobrowski, *Huawei Technologies*
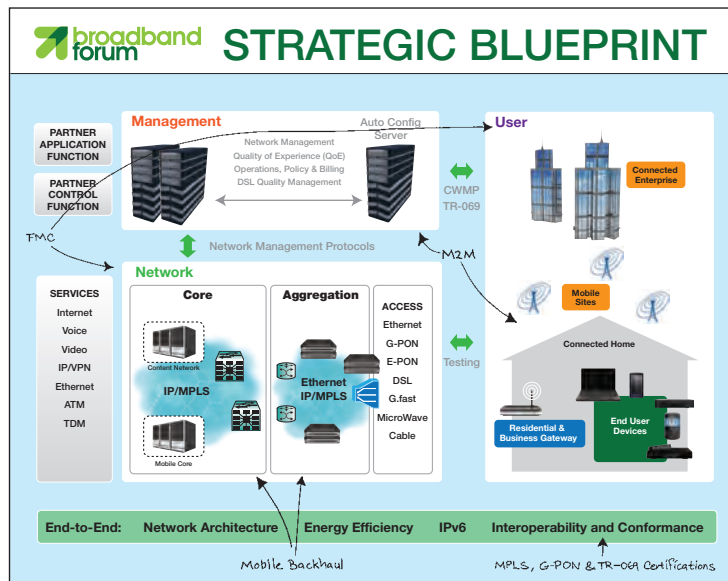Michael Fargano, *CenturyLink*

SIMR Vice Chair:
Christele Bouchat, *Alcatel-Lucent*

Service Provider Action Council Leadership Team

SPAC Co-Chairs:
Mauro Tilocca, *Telecom Italia*
Charles A. Rexrode II, *Verizon Communications*

STRATEGIC BLUEPRINT

Setting the Groundwork for Innovation

In 2012 the Board of Directors took steps to address innovation closer to the beginning of the innovation curve in order to secure earlier interoperability in new technology development. The Forum began to push beyond contributions to take a more long range view of industry requirements. In order to recognize key disruptors and opportunities on the horizon, it is critical to anticipate the rising trends and applications earlier in development so we can deliver 'day-one' interoperability – expediting industry advancements and success. A number of disruptors to our current architecture and management framework were identified including Fixed/Mobile convergence, Cloud and Virtualization, M2M and Software Defined Networks. To catalyze these key areas of work, a new cross technical and strategic marketing working group was established called **Service Innovation and Market Requirements** working group (SIMR).

Work has already started on the potential impact of Cloud, Virtualization and Software Defined Networks (SDN) on current broadband deployments. With greater anticipation and planning for the next wave of innovation in place, the Broadband Forum can provide early migration solutions and drive interoperability from day one of new services- proactively removing many obstacles to new service provider offerings and ensuring greater customer satisfaction.

The scope of activities includes (but not limited to):

• Evaluate market/technology trends with 3 to 10 years horizon

• Identify and assess potential enablers and disruptors

• Analyze market buzz/hype

• Conduct Gap analysis to identify what "dots" BBF needs to connect

• Develop service(s) description, business requirements, use cases

• Help coordinate strategic external liaison relationships

The work was off to a rapid start with development of working text "Framework for Cloud Services in Broadband Networks" identifying business and use cases, high level functional requirements and gap analysis, which will lead to identifying new work needed in the Technical Committee as well as the Marketing Committee white papers.

Work was also initiated on a study document "High Level Requirements and Framework for SDN in Telecommunication Broadband Networks." The work on both of these documents will lead to identifying new work activities needed on the development of specifications in the Technical Committee as well as white papers by the Marketing Committee in support of expanding the multiservice capabilities associated with emerging services. This will ensure BBF is central in evolving the broadband network influencing the way businesses and people consume services while positively impacting the Capex and Opex challenges that Service Providers face.

Organizing to Innovate

The issues facing the broadband industry will only become more complex as the impact of the disruptors being addressed by the SIMR Working Group come to bear. Complex requirements require comprehensive solutions which span the skill sets and remits of our Working Groups in both the Technical and Marketing Committees. To help coordinate these large multi-faceted projects, the Board of Directors has established a Steering Group whose responsibility is to execute on the Forum's overall strategy.

The **Marketing Committee / Technical Committee Steering Group** is made up of all the Working Group leaders of both Committees and is Co-Chaired by the Chairs of the Technical and Marketing Committees. Beyond coordination of larger projects, the Steering Group will also help the Board of Directors generally with the coordination of multi-working group initiatives and advise on the organization and processes that underpin the Forum's activities.

TECHNICAL COMMITTEE ACHIEVEMENTS

In 2012, our workload continued to be challenging as we covered 1593 contributions and progressed 58 working texts (WTs), finalized the new BBF.069 test plan and ultimately approved 34 technical reports (TRs). Following the Board's strategic directive, each working group prioritized their workload to ensure that key architecture, testing and remote management work moved forward quickly. A number of new work items kicked off including Energy Efficient Mobile Backhaul, FTTdp, ONU/OLT interoperability testing and a global method for broadband network performance measurements.

One major release was published; BroadbandSuite 6.0 "LTE Ready Mobile Backhaul" which addresses mobile backhaul network migration requirements with practical resources, specifications, test plans, and best practice documentation.

BroadbandSuite R6.0
TR-221: MPLS in Mobile Backhaul Networks
MR-234: MPLS in Mobile Backhaul Networks (tutorial)
MR-238: Use of MPLS in LTE (white paper)
MR-245: MPLS-TP in Multi-Service Packet Network Deployments (tutorial)
MR-258: Enabling Next Generation Transport and Services using Unified MPLS (white paper)
IP/MPLS Forum 20.0.0: MPLS in Mobile Backhaul Networks Framework and Requirements
TR-248/ATP-248 (IP/MPLS FORUM 23.0.0): Abstract Test Suite for TDM Services over MPLS (basis of the BBF.248 TDMoMPLS certification)

Working Group Progress

In the **End-to-End Architecture Working Group**, the team focused on interface definitions and nodal requirements for service delivery from the Customer Premises Equipment (CPE) through Access Node, aggregation network and Broadband Network Gateway (BNG), to peering interfaces with network and application service providers. In 2012 the work centered on specifying next generation fixed and 3GPP wireless interworking and interconnect, IPv6 transition mechanisms, an architecture for testing and reporting of broadband performance, and the technical specifications that will make up the Multi-service Network Architecture release – now scheduled for publication in 2013.

The **Fiber Access Network Working Group** developed technical specifications related to Optical Access Nodes and associated test plans for conformance and inter-vendors interoperability. They were very active expanding the ONU conformance testing program to address specific ONU profiles, as well as developing the test plans for a proposed Broadband Forum G-PON ONU/OLT test suite, which establishes OLT network interoperability with BBF.247 certified ONUs. Moreover, during 2012, the G-PON test plans were extended to XG-PON1 as well, covering both Physical Layer and upper layers for ITU-T PON technology. Optical layer management for PON access and Layer 2 PON architecture and functional requirements are now in development and new cross-group projects on Intelligent ODN and Fiber to the Distribution Point just started.

In the **Metallic Transmission Working Group**, valuable work was done to enhance DSL performance, testing and management. The focus was on developing functional and performance test plans for cross-vendor interoperability of broadband transmission technologies that use metallic media and boosting the speed and stability of DSL to better serve IPTV requirements. Working with the Marketing team, this group released a valuable new resource: MR-180 White Paper: Achieving Quality IPTV over DSL.

In 2012, the VDSL2 test suite continued to evolve. Plugfests were a critical part of progressing this work, with the industry's first two VDSL2 G.vector Chipset Plugfests. Work on multi-line performance and functional testing was also progressed, including the release of TR-273 that defines testing for bonded DSL systems. Work on test requirements and performance tests for G.hn, in association with the HomeGrid Forum, continued in 2012.

In the **BroadbandHome™ Working Group**, one of the major achievements was the completion and approval of the TR-069 related test suite and launch of the BBF.069 CPE Certification Program based on these tests. The approval of ITU-T G.9980, which specifies TR-069 for remote management, establishes the specification as a global standard.

There were a considerable number of updates to the TR-069 family of specifications especially updating the gateway and Femto access point data models to align with new market requirements. There was also new work developed to specify an IPDR-based mechanism, as defined by the TM Forum, which allows Service Providers to efficiently collect a potentially large amount of data from their entire CPE population on a regular basis.

In the **Operations & Network Management Working Group** the DSL Quality Management (DQM) suite was further developed including extending and updating the DQM system functional architecture and requirements as well as the performance and functional test plans. DSL and access node management models were also extended and updated and work was done on aligning BBF and TMF xDSL management specifications. New projects were started on Line Test management, G-PON management and the management of fiber access infrastructure.

The **IP/MPLS & Core Working Group** focused on providing the industry with specifications for application and deployment of IP/MPLS technology in converged networks. They addressed ways for IP/MPLS technology to facilitate deployment of IP and Ethernet services; providing the capability to address multiple applications such as mobile backhaul, Cloud and Data Center support. They specified the requirements for MPLS over Aggregated Interfaces (MPLSoAI) and pushed MPLS deeper into the access aggregation space.

New work on Carrier Ethernet support includes the development of technical architecture and equipment requirements implementing specified Ethernet services with an MPLS network. Energy efficiency work in mobile backhaul networks kicked off, and the group worked closely with the Marketing Committee to develop and deliver MPLS oriented tutorials at events around the world. There was also the start of core work focused on achieving Packet Network Optimization using DWDM Interfaces.

2012 Technical Reports

The Technical Committee was incredibly prolific in 2012. The deliverables ranged from market driven updates to existing specifications to new work. Below is the full list of Technical Reports produced in 2012:

Reports #	Title	Approved Date	Working Group
TR-154	TR-069 Data Model XML User Guide	Mar-12	BroadbandHome
TR-098 Amendment 5	Internet Gateway Device Data Model for TR-069	May-12	BroadbandHome
TR-157 Amendment 6	Component Objects for CWMP	May-12	BroadbandHome
TR-181 Issue 1 Amendment 3	Device Data Model for TR-069	May-12	BroadbandHome
TR-181 Issue 2 Amendment 5	Device Data Model for TR-069	May-12	BroadbandHome
TR-232	Bulk Data Collection	May-12	BroadbandHome
TR-252	xDSL Protocol-Independent Management Model	May-12	Operations & Network Management
TR-115 Issue 2	VDSL2 Functionality Test Plan	Jul-12	Metallic Transmission
TR-134	Broadband Policy Control Framework (BPCF)	Jul-12	End to End Architecture
TR-254	Functionality Tests for Ethernet Based Access Nodes	Jul-12	End to End Architecture
TR-100 Issue 2	ADSL2/ADSL2plus Performance Test Plan	Aug-12	Metallic Transmission
TR-124 Issue 3	Functional Requirements for Broadband Residential Gateway Devices	Aug-12	BroadbandHome
TR-197	DQS: DSL Quality Management techniques and nomenclature	Aug-12	Operations & Network Management
TR-203	Interworking between Next Generation Fixed and 3GPP Wireless Networks	Aug-12	End to End Architecture
TR-223	Requirements for MPLS over Aggregated Interfaces (MPLSoAI)	Aug-12	IPMPLS & Core
TR-242	IPv6 Transition Mechanisms for Broadband Networks	Aug-12	End to End Architecture
TR-273	Testing of Bonded, Multi-Pair xDSL Systems	Aug-12	Metallic Transmission
TR-127 Issue 2 Corrigendum 1	Dynamic Testing of Splitters and In-Line Filters with xDSL Transceivers	Nov-12	Metallic Transmission
TR-196 Amendment 1 Corrigendum 1	Femto Access Point Service Data Model	Nov-12	BroadbandHome
TR-196 Issue 2 Corrigendum 1	Femto Access Point Service Data Model	Nov-12	BroadbandHome
TR-098 Amendment 6	Internet Gateway Device Data Model for TR-069	Nov-12	BroadbandHome
TR-114 Issue 2	VDSL2 Performance Test Plan	Nov-12	Metallic Transmission
TR-135 Amendment 3	Data Model for a TR-069 Enabled STB	Nov-12	BroadbandHome
TR-145	Multi-service Broadband Network Functional Modules and Architecture	Nov-12	End to End Architecture
TR-156 Issue 3	Using GPON Access in the context of TR-101	Nov-12	Fiber Access Network
TR-157 Amendment 7	Component Objects for CWMP	Nov-12	BroadbandHome
TR-181 Issue 1 Amendment 4	Device Data Model for TR-069	Nov-12	BroadbandHome
TR-181 Issue 2 Amendment 6	Device Data Model for TR-069	Nov-12	BroadbandHome
TR-188 Issue 2	DSL Quality Suite	Nov-12	Operations & Network Management
TR-198 Issue 2	DQS: DQM systems functional architecture and requirements	Nov-12	Operations & Network Management
TR-207	Layer 2 Control Mechanism For Broadband Multi-Service Architectures part II	Nov-12	End to End Architecture
TR-260 Issue 2	DCF functional and performance Test Plan	Nov-12	Operations & Network Management
TR-272	BBF and TMF xDSL Management Specifications Alignment	Nov-12	Operations & Network Management
TR-286	Testing of Metallic Line Testing (MELT) functionality on xDSL Ports	Nov-12	Metallic Transmission

Technical Plans for 2013

Moving forward, there are some significant areas of development on the roadmap:

• The BBF.247 Certification Program will be extended to support more types of G-PON ONU devices. The BBF.255 Program will be launched, establishing interoperability between G-PON OLT and BBF.247 certified ONUs.

• The BBF.069 Certification Program will also be extended, covering devices from a wide range of industry segments – from Small Cells and Cable Modems to Network Printers, just to name a few.

• Fixed mobile interworking and convergence specifications will be delivered, in line with the timing of 3GPP Release 12. Updated BNG and Access Node specifications will be delivered as well.

• Vectoring and G.hn testing specifications will be delivered.

• The Multi-service Architecture and Nodal Requirements specification will be delivered.

• Fiber to the distribution point will be a very hot topic, with much work expected in the areas of architecture, copper and optical support, as well as management.

• Access service attributes and performance metrics will get growing attention from operators and regulators around the world.

• Machine to machine will continue to be an area of very strong focus.

• Work will start on IP and WDM network integration.

• Work will continue on Optical Line Management and Access Node management models.

• The support of cloud services and the application to broadband networks of SDN concepts will develop.

With a holistic approach to broadband solutions and a goal to enable interoperability from day one in future deployments, the Broadband Forum promises again to be very busy and productive in 2013.

LIAISON OFFICERS

The last year witnessed unprecedented levels of activity between the Broadband Forum and our liaison partners around the world, as the Broadband Forum has delivered major pieces of work and developed our industry relationships.

We received 92 incoming liaisons and sent out 79 liaisons to 33 different groups in the last year, as well as holding workshops with key partners 3GPP and ETSI on common interest projects. We liaise our work around the world and as our scope of work has grown to address fiber technologies, business services, mobility and home networking requirements, the number of active partners has grown. We work extensively with many organizations that are key to the industry, and that work will only deepen in the coming year.

Partner Organization	Type of Partnership	BBF Liaison Officer
3GPP	Collaboration	Jaume Rius i Riu, Ericsson
3GPP2	Liaison	Doug Knisely, Qualcomm Incorporated
Alliance for Telecommunications Industry Solutions (ATIS)	Liaison	Tom Starr, AT&T
Digital Living Network Alliance (DLNA)	Liaison	Barbara Stark, AT&T
Digital Video Broadcasting project (DVB)	Liaison	William Lupton, Cisco Systems
European Commission Joint Research Center (EU JRC)	Liaison	Frank Van der Putten, Alcatel-Lucent
European Telecommunications Standards Institute (ETSI)	Cooperation	Robin Mersh, BBF Olivier Van De Wiel, Broadcom
Full Service Access Network (FSAN)		Alessandro Capurso, Telecom Italia S.p.A
HomeGrid Forum (HGF)	Collaboration	Robin Mersh, BBF
Home Gateway Initiative (HGI)	Collaboration	Robin Mersh, BBF
IEEE P1904.1 SIEPON	Liaison	Lowell Lamb, Broadcom
Internet Engineering Task Force (IETF)	Liaison	David Sinicrope, Ericsson Andrew G. Malis, Verizon Communications
International Telecommunication Union (ITU-T)	Collaboration	Tom Starr, AT&T (WP 1/15) David Sinicrope, Ericsson Frank Van der Putten, Alcatel-Lucent
ISO IEC/JTC 1	Liaison	Robin Mersh, BBF
IPv6 Forum	Liaison	Lincoln Lavoie, UNH InterOperability Lab
Metro Ethernet Forum (MEF)	Liaison	Scott Mansfield, Ericsson
MultiService Forum (MSF)	Liaison	Robin Mersh, BBF
MoCA	Liaison	Robin Mersh, BBF
Open IPTV Forum	Liaison	Robin Mersh, BBF
Open Mobile Alliance (OMA)	Cooperation	Jason Walls, QA Café
OSGi	Liaison	Robin Mersh, BBF
Small Cell Forum	Cooperation	Robin Mersh, BBF
Telemanagement Forum (TMF)	Cooperation	Robin Mersh, BBF
Universal Plug And Play Forum (UPnP)	Liaison	Barbara Stark, AT&T William Lupton, Cisco Systems
Wi-Fi Alliance	Liaison	Robin Mersh, BBF
WiMAX Forum	Collaboration	Robin Mersh, BBF
Zigbee Alliance	Liaison	Jason Walls, QA Café

Broadband Forum stays aligned with Industry Partners

"ITU welcomes the Broadband Forum's initiative to contribute its TR-069 management protocol for inclusion within an international ITU-T Recommendation. I believe this will strongly promote the availability of the standard and help operators to manage the wide range of devices on their networks and help to shape today's broadband landscape."

— Malcolm Johnson,
    Director Telecommunication
    Standardization Bureau, ITU

"G-PON has proven to be a viable and successful technology for access networks worldwide," said Martin Carroll of Verizon, FSAN Committee Chair. "Fully endorsed by FSAN, the Broadband Forum G-PON Certification program will further substantiate G-PON capability to meet the growing demands of evolving operator networks."

— Martin Carroll, FSAN

MARKETING COMMITTEE ACHIEVEMENTS

In 2012, the Marketing Committee continued its role, ensuring quality content development for tutorials and white papers, and promoting Broadband Forum milestones and news via all of our marketing communications tools. The focus is on deploying resources to educate, liaise and promote new options and solutions, while championing new industry standards and cooperation, and expediting broadband growth. With the expanded remit of providing the industry with more insight into the direction and vision of the Broadband Forum, the team also produced a number of more visionary bylines and press releases. Overall the team developed a valuable new library of white papers, tutorials, collateral and videos to assist in education and membership outreach efforts.

Content Development

A number of outstanding new white papers were produced as well two new tutorials were developed and delivered at industry events to great industry response.

White Papers

• MR-180 White Paper: Achieving Quality IPTV over DSL

• MR-257 White Paper: An Overview of G.993.5 Vectoring

• MR-261 White Paper: Motivation for Testing xDSL Splitters and In-Line Filters

New white papers in development include topics such as Connected Business Gateways, IPv6 Migration in Real World Deployments, M2M Standardization, Fixed Mobile Convergence and the Evolution of the Multi-Service Broadband Architecture.

Tutorials

• MR-154 Tutorial: TR-069 Data Model XML

• MR-305 Tutorial: MPLS Mobile Backhaul Evolution – 4G LTE and Beyond

A number of new tutorials are in development as well, including ones on G-PON in FTTx Deployments, an Introduction to MPLS (non-technical audience) and the Broadband Architecture Evolution.

Marketing Communications

The marketing communication efforts were very prolific this year and the results were outstanding. Not only did we achieve positive coverage in more publications around the world than ever before, we also won our first industry standards award, the InfoVision "Outstanding Contribution to Broadband Success" for our work on TR-069.

"In accepting the award on behalf of the Broadband Forum we recognise the efforts of our members who pioneered the CPE WAN management specifications, the vendors who built the capability into their global products and the operators who have enabled over 147 million broadband devices to deliver excellent customer experience."

— Kevin Foster, President Broadband Forum

We commissioned a study by Ovum to assess the reach and market utilization of TR-069 and the results were outstanding; showing more than 147 million devices were being managed via TR-069 at the end of 2011, and that number was rapidly growing. The launch of the BBF.069 CPE Certification program was also a great success and included a well attended Service Provider reception where we were able to share our latest interoperability work with over 80 service provider representatives.

2012 activities include:

- 5,289 pieces of global coverage
- 12 press releases
- 13 bylines produced
- 3 Ads/advertorials designed and placed
- 9 educational videos produced

- 4 educational booths
- 22 Ambassador presentations
- 4 tutorials given at events
- 1 Interoperability
  Service Provider Reception

Summit and Best Practices

The Summit and Best Practices committee focuses on securing high-level informative keynotes and birds of a feather panels for the Forum's quarterly meetings. The list of speakers and topics for the 2012 quarterly meetings is listed below:

- **Implications of the WCIT for the Internet**
  Presented by: Sally Wentworth, Senior Policy Manager, Internet Society
  (Albuquerque, New Mexico USA)

- **Industry Update**
  Presented by: Tim Johnson, Consultant Analyst, Point Topic
  (Bucharest, Romania)

2012 Educational Booth

Marketing Communications continued the work focused on promotion vehicles, such as tradeshows, conference appearances, PR and enhanced web presence.

Event	Location	Date
MPLS & Ethernet World Congress	Paris, France	February 7 - 10, 2012
FTTH Council Europe	Munich, Germany	February 14 - 16, 2012
CommunicAsia	Singapore	June 19 - 22, 2012
Broadband World Forum Europe	Amsterdam, The Netherlands	October 16 - 18, 2012

International Development

One of the key goals of the Forum marketing team is to empower growth markets with as much information, best practices and tools available to help them expedite and build their networks on a strong standards platform. In 2012, the key markets that the team focused on were Russia, India, Brazil and growth countries in Asia. We addressed these markets through one-on-one executive meetings, tradeshow appearances at Convergence India, ConvergeTec Brazil, Broadband Forum Russia and CommunicAsia, regional bylines and advertising.

TR-069 enabled devices: total installed base by region	
–	YE 2011
Asia/Asia Pacific	59,825,000
Europe	46,703,000
Americas	28,230,000
Middle East & Africa	13,218,000

Managed TR-069 devices: by device type	
	YE 2011
Residential Gateway	103,582,771
Set-top Box	22,196,308
Femtocell	7,398,769
IP Phone	3,699,385
Network Attached Storage	3,699,385
Home Automation & Control	7,398,769

Source: Ovum "Connected Home" report, 2012

Ambassadors

The Ambassador committee continued to educate the marketplace about new technical solutions and inform them about the work of the Broadband Forum. The Ambassadors, who are Broadband Forum subject matter experts, participated in speaking opportunities that showcased the Forum's work and new specifications. With 3 new Ambassadors added in 2012, the education efforts were truly global, with 30 presentations made throughout the world.

Americas	**3**
Europe	**17**
Asia	**8**
Middle East	**2**

Special thanks to our 2012 active ambassadors who spoke at the following events:

• **Peter Macaulay** – Management World Asia 2012 (February 2012)

• **Dave Sinicrope**, **Nurit Sprecher**, **Santiago Alvarez,** and **Dr. Yakov Rekhter** –
  MPLS & Ethernet World Congress (February 2012)

• **Dean Cheng** – V6 World Congress (February 2012)

• **Robin Mersh** – FTTH Council 2012 (February 2012)

• **Robin Mersh** – Convergence India 2012 (March 2012)

• **Kevin Foster** – TNO's Broadband Home Seminar (March 2012)

• **Kevin Foster** – IP&TV World Forum (March 2012)

• **Nikhil Shah** – Mobile Backhaul Asia 2012 (March 2012)

• **Robin Mersh** – ConvergeTec (April 2012)

• **Dean Cheng** – Global IPv6 Summit 2012 (April 2012)

• **Peter Macaulay** – FTTH Council Asia Pacific (May 2012)

• **Peter Macaulay** – Broadband World Forum Asia (May 2012)

• **George Dobrowski** – 2012 Annual IEEE International Communications
  Quality and Reliability (CQR) Workshop (May 2012)

• **Ian Hood** – IPv6 World Congress (May 2012)

• **Lindsey Frost** – Panel at ConLife 2012 (May 2012)

• **Robin Mersh** – CommunicAsia (June 2012)

• **Christophe Alter** – WDM & Next Generation Optical Networking (June 2012)

• **Nikhil Shah** – 4th LTE India 2012 International Conference (October 2012)

• **Kevin Foster**, **Robin Mersh**, **Christophe Alter**, **Lincoln Lavoie**, and **Jason Walls** –
  Broadband World Forum Europe (October 2012)

• **Dave Sinicrope**, and **Rami Yaron** – MPLS 2012 (October 2012)

• **Robin Mersh** – Broadband World Forum Russia (November 2012)

• **Robin Mersh** – IPCable World Summit (November 2012)

• **Nikhil Shah** – Carrier Ethernet APAC (December 2012)

Public Relations

The Public Relations team had a tremendous amount of solid news to report in 2012, spanning from Broadband/IPTV Growth Milestones to the launch of our BBF.069 CPE Certification program. With so many strong Broadband Forum news pieces, it was no surprise that our global coverage showed impressive growth over that of past years. We also saw a surge of companies and other organizations reporting their BBF certification success, adherence to our TRs or simply promoting that they are engaged in Broadband Forum work- all great indications of the impact that the Forum is having on the industry.

Below shows the amazing growth of the public relations outreach over the last three years:

	2010	2011	2012
Overall coverage tracked	1292	3732	5289
Coverage – BBF press release driven	1051	3404	3331
News releases issued	9	17	12
Media interviews	34	104	78
Video/broadcast interviews	4	14	9
Analyst briefings	5	7	10
BBF bylined Articles / Features	13	13	13
Coverage - General industry mentions	125	262	491
Coverage - Member reference	65	66	1467
Press conferences	3	6	3
White Paper placements	6	5	13

Below are the key headlines from 2012:

• Broadband Delivers Strongest Growth Since 2009 (January 12, 2012)

• New BBF BroadbandSuite 6.0: 4G/LTE Ready Mobile Backhaul (February 5, 2012)

• Hybrid FTTx leads the growth in broadband access (February 15, 2012)

• 2011 Broadband Growth Fastest in Five Years (March 21, 2012)

• Major standards organizations cooperate to drive the development of Home Environment Services (April 24, 2012)

• Broadband Forum Supports World IPv6 Launch Day (May 31, 2012)

• New Ovum Report: 147 M+ devices now managed via TR-069 (June 19, 2012)

• Broadband Forum passes 600 million subscriber milestone (in English) (June 20, 2012)

• Broadband Forum Holds Industry's First VDSL2 G.Vector Plugfest (October 10, 2012)

• Q2 Broadband and IPTV Subscription Figures (October 16, 2012)

• Broadband Forum wins Outstanding Contribution to Broadband Success award (October 18, 2012)

• Broadband Forum Ends the 2012 Year Strong (December 18, 2012)
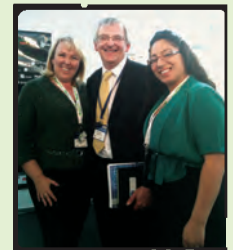
BBF.069 CPE CERTIFICATION MEANS SERVICE PROVIDERS ROLL OUT NEW PRODUCTS WITH CONFIDENCE

With billions of devices connecting us to new services and applications, and machines beginning to interact directly to other machines (M2M), the way to manage this complex environment has never been more important.

TR-069, the Broadband Forum's CPE WAN Management Protocol (CWMP), is recognized as the 'gold standard' of remote management. Originally conceived for the connected home market, TR-069 has expanded to cover business services, M2M and Cloud environments. The protocol is set to become even more pervasive following the 2012 launch of the first ever **Broadband Forum BBF.069 CPE Certification program.**

Achieving BBF.069 certification sends a clear and simple message to the industry confirming that a device is market-ready. It helps equipment vendors reduce testing overhead, and enables them to easily market their products – increasing their ability to address a much larger market overall.

The goals of the program are:

• To verify that devices are TR-069 protocol-compliant and market-ready

• To simplify integration of home networking systems and equipment into providers' networks

• To improve device interoperability, making it cost effective and easy for
  service providers to provision and manage the plethora of devices coming online

The Broadband Forum Certification program has substantial advantages for all participants in the value chain. The program ensures network compliance and quality, and offers service providers an enhanced level of confidence that certified CPE devices will interoperate better with their remote management Auto-Configuration Servers.

It is all about managing beyond the broadband gateway – and facilitating interaction with other devices such as STBs, IP phones and Network Attached Storage (NAS) connected to the home network. This is critical to the provider's capacity to exceed customer expectations as they are able to remotely configure, manage and troubleshoot all the cool new devices coming online. For consumers, that is a promise of hassle-free service provisioning, trouble-shooting and upgrades.

TR-069 ensures-

• More digital home solutions, CE equipment, 'smart' meters and appliances can be sold with confidence

• Increase content downloads and sales as content providers target the multi-screen and device ecosystem

• More gold class of broadband upsells as service providers create attractive new bundles, while reducing equipment
  and network costs through TR-069 remote management- ultimately increasing customer loyalty and 'stickiness'

• TR-069 based home control and monitoring will be a new utility provider option

The role of TR-069 is therefore critical to providers' ability to monitor, manage and control an increasingly complex array of connected devices, terminals and equipment. It enables providers to maintain high levels of quality end user experience, and provides them with tools to improve customer service- two prerequisites that are important factors in successfully commercializing multi-screen and blended service propositions.

Beta testing concluded successfully on the new TR-069 conformance tests, and the new BBF.069 CPE Certification program was launched during third quarter of 2012. The program provides the broadband industry with a baseline for the CWMP functionality present in CPE devices. This offers broadband vendors a powerful marketing tool to highlight that their products are market ready and adhere to TR-069.

Congratulations to the following companies for having products pass BBF.069 certification:
ActionTec, Broadcom, Cisco Systems, D-Link, Huawei Technologies and Lantiq.

BBF.069 launch team at the Broadband World Forum, Amsterdam 2012

BROADBAND FORUM BBF.247 ONU CERTIFICATION PROGRAM GROWS

In 2011, the Forum launched the BBF.247 G-PON ONU Certification Program- the industry's first G-PON certification program based on test plans developed by the Broadband Forum with support of FSAN and ITU-T. The program is open to G-PON ONU products with ethernet interfaces and is based on the IR-247 Test Plan. The certification proves conformance to TR-156 using OMCI as defined in the ITU G.988, which are the most critical standards for interoperability.

Having BBF.247 certified ONUs ensures that vendors' products are easily integrated by any G-PON OLT manufacturer.

The interoperability efforts don't stop here, but are expanding in three key areas:

• ONUs with other profiles and types of interfaces/features will be addressed in the very near future, along with extensions for XG-PON 1

• Excellent for testing ONUs designed for specific markets such as those tailored for residential or business

• ONU/OLT Interoperability Test Plan is nearing completion, and the ONU Conformance Certification will be a requirement to participate in the Interoperability Test Program

The number of companies with certified ONUs rose to 9 in 2012; Alcatel-Lucent, Broadcom, Cambridge Industries Group Ltd., FiberHome, Huawei Technologies, PMC-Sierra, PT Inovação S.A., Tecom Co. and ZTE Corporation. Congratulations to each of these companies for their products achieving certification.

SERVICE PROVIDER ACTION COUNCIL (SPAC)

The Service Provider Action Council (SPAC) brings the service provider community together to guarantee the Broadband Forum has continuous guidance on service requirements and technical evolution. This engagement of Service Providers guarantees market relevance and timely specification delivery. At the meetings in 2012, the SPAC attendance averaged 36 attendees from over 14 service provider companies.

Topics in 2012 included:
• G.hn Testing Requirements
• G-PON Certification
• SD-263 "FAST Digital Access over Short Subscriber Loops – DAZZLE"
• Policy and Convergence in Wireless Networks
• Establishing Power Consumption Targets for OLT/ONU
• IP Network Optimization and DWDM Interworking
• Fiber to the Distribution Point (FTTdp) Project
• Service Provider Priorities Mapped to the BBF Internal Roadmap (OD-218)
• Network Functions Virtualization (White Paper)
• Access Node performances for OSS interactions

To provide direction and oversight regarding new projects being proposed in 2012 to the appropriate working groups, there were a number of SPAC NPIF reviews. The NPIFs discussed were:

• Dazzle FTTdp: Architecture
• Broadband Access Service Attributes and Performance Metrics Intelligent ODN – NPIF for Architecture and Requirements Development
• FTTdp Initiative Project Plan

One of the most valuable elements of SPAC engagement is the ability to survey the service providers on requirements, market issues and opportunities. These surveys provide valuable data to the working groups to assist in solution and specification development. In 2012, the following surveys were completed by the service provider community:

• Policy Convergence from a Wireline Perspective
• Home Networking Technologies
• Power Consumption Targets for OLT/ONU
• Reverse Feeding and POTS Coexistence
• XG-PON1 TC Layer Options
• Use Cases and Real World Deployment Practices for IPv6 Migration

BROADBAND FORUM MEMBERSHIP AND OPERATIONS

The Broadband Forum has been at the forefront of many of the improvements happening in the broadband industry. Despite the challenging economic climate, our membership was again stable in 2012. We were pleased to add new service providers, including our first cable companies, as well as new fiber and wireless focused members who were attracted to some of our new initiatives.

The graphs below show the diverse regional and industry segment breakdown.

Regional Membership

### Industry Segment Breakdown
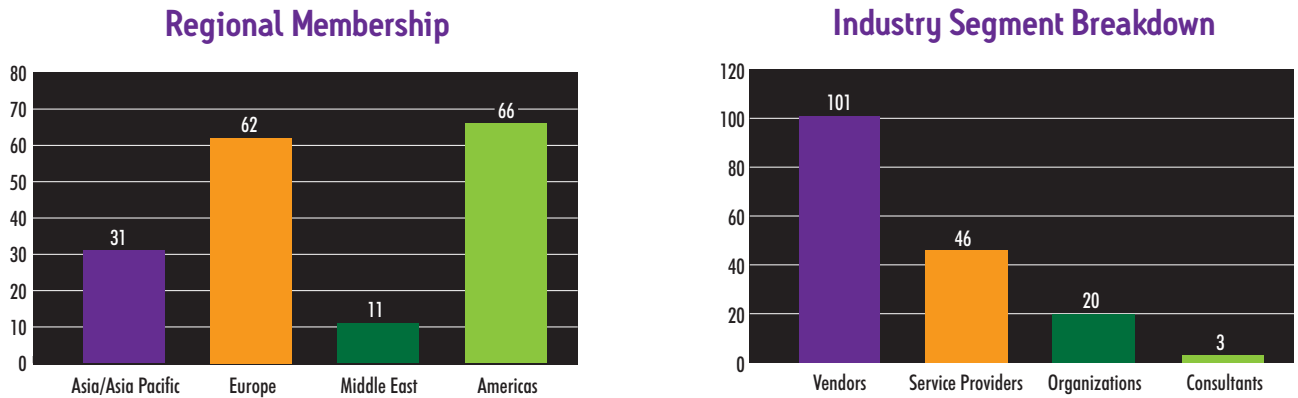
In 2012, we met twice in Europe, once in Asia and once in N. America.

As it is every year our focus in 2012 for Forum operations was to ensure continued member satisfaction, and that services were delivered efficiently and cost effectively. 2012 has seen continued success with key objectives met and best practices maintained.

Date	Location	Number attending	Sponsor
March 12 - 16, 2012	Dubrovnik, Croatia	163	
May 21 - 25, 2012	Albuquerque, New Mexico	186	HomeGrid Forum
August 27 - 31, 2012	Bucharest, Romania	162	Huawei Technologies Co., Ltd.
December 3 - 7, 2012	Osaka, Japan	155	

The website experienced a facelift in 2012, and a new library of videos was put out on Vimeo and added to the public Broadband Forum site, drawing more visitors. The site received approximately 66 thousand visitors per month and each visitor accessed 12 pages per visit on average. The Broadband Forum's Linked In group, set up for members and alumni, also grew and has now passed 1000 group members. The private ARO members' contribution and communication engine was also updated to provide easier visibility to work in progress and the internal roadmap of all work of the Forum. It continues to be enhanced with new online member tools and increased support for volunteer editors.

The new project initiation process (NPIF) launched in 2011, and became a valuable tool in 2012 to assess 41 new work proposals. To provide more clarity and better industry communication of our work, a number of new document types and work flow were agreed.
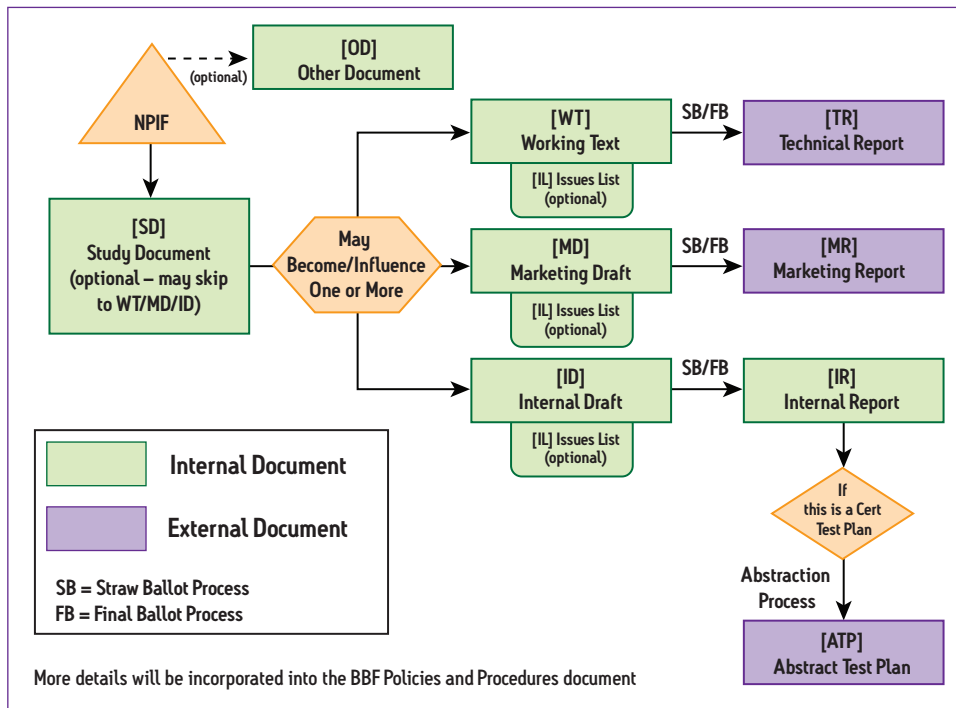
Member Recognition

In 2012 many of our members were recognized for their valuable contributions to the industry and specifically to the Broadband Forum. Below are the lists of awards and recipients. We thank each person and each company for their outstanding support.

Distinguished Fellow

The Distinguished Fellow title is bestowed by the Broadband Forum to exceptional individuals who have over time provided a major influence on the direction and success of broadband development. These are the key individuals who help the Forum chart new technology solutions, drive best practices to overcome deployment obstacles, and whose vision continues to inspire our industry's growth.

• **Thomas Anschutz**, AT&T

• **Andrew G. Malis**, Verizon Communications

Leadership Award

The Leadership award is given to outgoing, commendable working group chairs or Board members. These individuals, who have dedicated their time and leadership ability to establishing our success, have gone above and beyond the call of duty within the Broadband Forum and we thank them for their service.

• George Dobrowski, Huawei Technologies

• Rao Cherukuri, Juniper Networks

• Greg Bathrick, PMC-Sierra

Circle of Excellence

The Broadband Forum recognizes the exceptional contributions of its members through the "Circle of Excellence" award, which is awarded at our quarterly meetings. The recipients inducted into the Circle of Excellence are determined by membership nomination with selection based on leadership, diligence, or having provided a contribution that was foremost in advancing the Forum's mission.

• William Welch, Juniper Networks

• Klaus Wich, Nokia Siemens Networks

• Yves Hertoghs, Cisco Systems

Outstanding Contributor Award

Once a year, at the annual meeting, the Outstanding Contributor awards are given to individuals who, during the previous year, went above and beyond the call of duty within the Forum working groups by making many contributions throughout the year as well as effectively moving the consensus process forward. Both the quantity and quality of the contributions are taken in to consideration.

• Christopher Croot, BT

• Lowell Lamb, Broadcom

• Yves Hertoghs, Cisco Systems

• Michael Langhammer, Deutsche Telekom

• William Welch, Juniper Networks

• Alex Fedosseev, Motorola Mobility

• Tim Spets, Motorola Mobility

• Yoav Cohen, Nokia Siemens Networks

• William Lupton, Pace

MEMBERSHIP LIST

170 Total Members as of December 31, 2012

*New members

Principal Members (92)

A1 Telekom Austria AG	ECI Telecom	NTT Corporation
Actelis Networks	Eircom, Ltd *	Pace
Actiontec Electronics	Ericsson	PMC-Sierra
ADTRAN	Entropic Communications*	Portugal Telecom Inovação, SA
ADVA Optical Networking Ltd	EXFO	Qatar National Broadband Network (Qnbn)*
Advanced Digital Broadcasting S.A.	Fastweb SPA	Qualcomm Incorporated
Airvana, Inc.	Foxconn *	RAD Data Communications
Alcatel-Lucent	France Telecom	Ralink Technology Corporation
AT&T	Fujitsu	Sagem Communications
AVM	Furukawa Network Solution*	Sigma Designs
Aware	Google, Inc.	Sky Networks Services
Belgacom	Hitachi Communications Technologies America	Softbank BB Corp.
Bell Canada	Huawei Technologies Co., Ltd.	Spirent Communications
Broadcom	Ikanos Communications	Sumitomo Electric Industries
Broadlight	Iskratel	Swisscom (Switzerland) Ltd.
BT	Ixia	TDC A/S
Cable & Wireless Worldwide	JDSU	Technicolor
Cable Television Laboratories, Inc*	Juniper Networks	Tekelec
Calix Networks	Keymile	Telecom Italia S.p.A
CenturyLink	KPN	Telefónica Standards
China Mobile Communications Corporation	Lantiq	Telekomunikacja Polska S.A.
China Telecom	LSI Corporation	Telenet NV*
Chunghwa Telecom Labs	Marvell Semiconductor Inc*	Telenor
Cisco Systems	MegaPath	TeliaSonera
Consona Corporation	Microsemi	TELUS Communications, Inc.
Cortina Systems, Inc.	Motorola Mobility	Tollgrade Communications
Cyta	National Broadband Network	TTNet A.S.
D-Link	NEC	Verizon Communications
Deutsche Telekom	Netgear	Vodaphone Group Services
DISA	Nokia Siemens Networks GmbH & Co. KG	ZTE Corporation
DragonWave Inc.	Nominum*	

Small Company Principal (32)

Affinegy*	Iphotonix	Sparnex Instruments
Alphion	LAN	Starbridge Networks, L.L.C.
ASSIA Inc.	Marben Products	Tail-f Systems
AvSystem*	Metanoia Communications	Telebyte, Inc.
Axiros	Mitsubishi Electric RCE France	TRaC Global Ltd.
BandWD	MT2	Tracespan Communications
Cambridge Industries Group Limited	Network Automation MXC AB	UNH Interoperability Lab
Dimark Technologies, Inc.	QA Café	Viagénie
EANTC	Real Communications	Wilcom
East by North	SamKnows, Ltd.*	Xtendwave*
Horizon Analog, Inc.*	SmartRG *	

Auditing (33)

Agama Technologies	KCCS Mobile Engineering Co., Ltd.*	Tecom
AirTies	KDDI R&D Labs, Inc.	Telecom New Zealand
Allied Telesis	Mquadr.at	Telekom Slovenia
Arcadyan Technology Corp.	Observa Telecom*	Telkom SA Ltd
Askey Computer	OPT New Caledonia	Telstra Corporation Ltd.
Bouygues Telecom	Rancore	Tilgin
Edimax Technology Co., Ltd	Samsung Electronics Co., Ltd.	Transmode
Fiberhome Telecommunications Technology Co., Ltd.	SaskTel	Triductor Technology
Friendly Technology (FTL) Ltd.	ServComm Inc.	Westermo
Gemtek Technology Co.	SMC Networks	Zhone Technologies
Jungo	Suttle	Zyxel Communications

Associate (13)

Alabama State University	ITRI	Research Institute of Telecommunications Transmission (RITT)
Anacom	Layer123	Tecnalia Research & Innovation
ETRI	National Exchange Carrier Association	TNO
Fraunhofer Institute	National Media and infocommunications Authority	
Fundacao CPqD	Point Topic	

*New members in 2012

FINANCIAL REPORT

Auditors John Waddell & Co, Certified Public Accountants, have audited the financial statements of the Broadband Forum. The following gives an overview over the key financial figures and indicators of the Broadband Forum.

STATEMENT OF FINANCIAL POSITION

December 31		2012		2011
Assets				
Cash	$	807,992	$	545,678
Certificates of deposit		838,000		1,080,000
Accrued interest receivable		5,008		4,316
Prepaid expenses		13,290		16,766
Investments in marketable securities		890,474		754,607
Total Assets	$	2,554,764	$	2,401,367
Liabilities				
Accounts payable	$	89,608	$	26,569
Deferred membership dues		535,275		444,450
Total Liabilities		624,883		471,019
Net assets - unrestricted		1,929,881		1,930,348
Total Liabilities and Net Assets	$	2,554,764	$	2,401,367

STATEMENT OF ACTIVITIES FOR THE YEARS ENDED

December 31		2012		2011
Revenue				
Membership dues	$	1,302,550	$	1,267,649
Meetings		295,365		355,620
Sponsorship fees		60,797		69,700
Interest and Investment Income		71,839		42,585
Other		42		–
Total Revenue	$	1,730,593	$	1,735,554
Expenses				
Meetings	$	521,198	$	689,889
Tradeshows		53,950		64,810
Management fees		610,424		581,367
Marketing and public relations		384,031		302,064
General and administration		100,461		110,486
BBHome tech fees		44,400		67,624
Strategic initiatives		11,897		12,384
Miscellaneous/contingency		4,699		7,961
Total Expenses	$	1,731,060	$	1,836,585
Change in Net Assets		(467)		(101,031)
Net Assets – unrestricted				
Beginning of year		1,930,348		2,031,379
End of year	$	1,929,881	$	1,930,348

2013 MEMBERSHIP LEVELS

The Broadband Forum is an international non-profit industry association focused on engineering smarter and faster broadband connections. Our work defines best practices for global networks, enables service and content delivery, establishes technology migration strategies, engineers critical device and service management tools, and is key to redefining broadband.

Principal Members – $12,600 US

• Attendance to all annual, general and committee meetings of the Forum

• One vote each on all Forum issues, technical reports, and marketing reports

• Access to all working documents, contributions, technical reports, tutorials and meeting minutes

• Eligibility to run for Board of Director and Committee officer positions

• Eligibility to submit Technical Committee and Marketing Committee contributions

• Eligibility to take part in Forum testing events and programs (including those co-hosted with other organizations)

• Subscription to all Broadband Forum email mailing lists

Small Company Principal Membership – $5,450 US

• All the privileges listed above for a Principal Member

Note: In order to allow for a more cost-effective membership for medium-sized companies, the Board of Directors has decided to increase the annual revenue threshold for the Small Principal member category. Starting from 2012, this threshold was set at $20 million USD, which means Small Company Principal Members must have had annual revenues under $20 million USD in the previous year. They are required to submit a letter from their CEO stating this.

Auditing Membership – $4,450 US

• Attendance to all annual and general (i.e., Summit and Plenary) meetings of the Forum

• Access to all working documents, contributions, technical reports, tutorials and meeting minutes

• Subscription to all Broadband Forum email mailing lists

• Eligibility to take part in Forum testing events and programs (including those co-hosted with other organizations)

• Auditing members may NOT attend committee meetings (i.e., Technical and Marketing Working Group meetings) of the Forum and are NOT eligible to submit Technical Committee or Marketing Committee contributions or vote on Forum issues, technical reports or marketing reports

Associate Membership – $1,150 US

• Attendance to all annual, general and committee meetings of the Forum (but not eligible to vote)

• Access to all working documents, contributions, technical reports, tutorials and meeting minutes

• Subscription to all Broadband Forum email mailing lists

Note: Associate Members must be not for profit or educational institutions. Institutions will be approved for membership annually by a majority vote of the Board of Directors.

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WINNER

Outstanding Contribution to Broadband Success
TR-069 CPE WAN Management Protocol

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www.**broadbandworldforum**.com

An electronic copy of this report can be downloaded from:
http://www.broadband-forum.org/news/annualreports.php

broadband forum

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