broadband forum

2018
Annual Report

Chairman's Letter

Dear members and industry colleagues,

2018 was an exceptional year for both the broadband industry and Broadband Forum with tremendous change and transformation being the operative rule. As we reflect on all that we accomplished in 2018, one milestone in particular stands out as indicative of what we at Broadband Forum have achieved to date – the announcement of the one billionth broadband installation globally (click here to see celebratory video). This achievement is a clear reminder that our membership has been engaged in a noble pursuit – the connection of over one billion homes and businesses globally – and that, with another billion yet to go, we have an exciting future ahead as we continue to shape the future of broadband in every corner of the world.

Our overarching purpose remains the same, namely to provide value in a way that best serves the industry, our membership and end users, and to keep focus on incremental revenue-generating services and seamless migration. In 2018, Broadband Forum continued to lay the foundations for a truly connected world and an ever-improving broadband experience across all of our major project areas – 5G, Connected Home, Cloud, and Access which in turn have over 100 projects supporting them – as well as our major initiatives, including our Open Broadband initiative, testing and certification programs, technology councils, and BASe educational series. All yielded fantastic results in 2018 while blazing paths to mass adoption for exciting new technologies and services!

To catch up on the state of all of our major projects, I encourage you to take a look at our Broadband Forum YouTube channel, where we keep up-to-date video interviews with the leaders of all of our work areas and initiatives.

There has never been a more exciting time to be a part of Broadband Forum. The depth and breadth of our work continues to grow, and we look forward to the sustained passionate involvement of our membership. If you are a Broadband Forum member and would like more details on any project, please visit the Member-only BBF wiki. Additionally, in 2019, we are seeking to partner with our member companies to align the power and validation of the Broadband Forum brand with their marketing and brand-building activities. Our Broadband Acceleration Seminar (BASe) series – which, along with our technology councils, allows our members to highlight their thought leadership in cutting-edge technologies – has continued to gain momentum. We plan on an expanded set of BASe events in 2019 and will be offering new opportunities to highlight member participation through sponsorships, demonstrations, and speaking opportunities.

2019 promises to be a phenomenal year for Broadband Forum, and we look forward to innovating and pioneering with each of our members as we shape the future of broadband together. As a Forum, we stand ready to enable the next billion broadband installations and vastly improve the experiences of the one billion customers already connected, and we welcome your continued – and expanded – participation.

On behalf of the Board and staff, may I take this opportunity to thank you for your continued support.

Sincerely,

Kevin Foster
CEng. FIET, Chairman, The Broadband Forum

In the 2018 Annual Report

Kevin Foster
Chairman, BT

Tom Starr
President, AT&T

David Sinicrope
Vice President, Ericsson

Frank Van der Putten
Treasurer, Nokia

Bernd Hesse
Board Member and BASe Chair, Calix

John Blackford
Board Member, ARRIS

Ken Ko
Board Member and Secretary, ADTRAN

Aleksandra Kozarev
Board Member, Intel

Robin Mersh
CEO, Broadband Forum

Les Brown
Board Member, Huawei Technologies

Manuel Paul
Board Member Deutsche Telekom

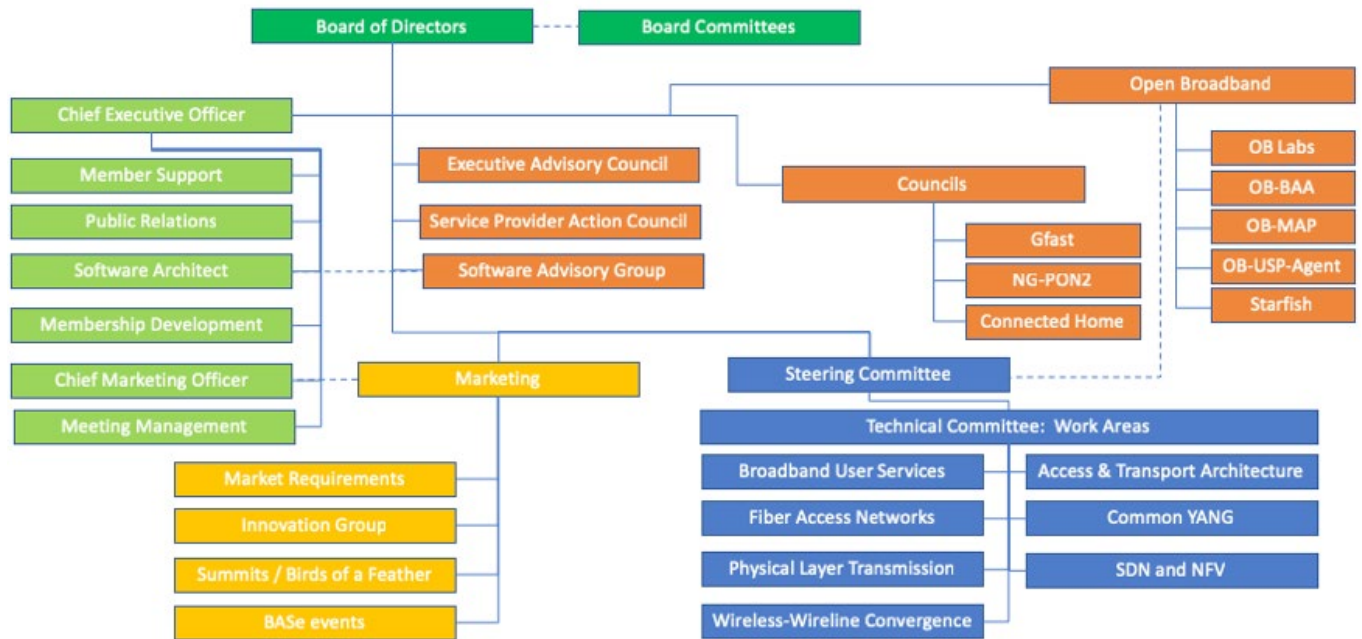**Mauro Tilocca**
Board Member Telecom Italia

Lincoln Lavoie
Technical Committee Chair, UNH-IOL

2018 Published Work

CLOUDCO-APPN-000: ....Bootstrapping an NFVI to a Cloud Central Office
CLOUDCO-APPN-001: ....Establish High Speed Internet Access (HSIA) service
CLOUDCO-APPN-002: ....NERG with Flat LSL
CLOUDCO-APPN-003: ....NERG with Overlay LSL
CLOUD-CO-APPN-004: ....Activation and Initial Provisioning of Access Devices
CLOUDCO-APPN-006- ....Virtual Access Node (vAN)-based FANS service
CLOUDCO-APPN-007- ....SDN-based FANS service
MR-427 ....5G Fixed-Mobile Convergence
MR-430 ....CloudCO: enabling cloud-based broadband services
MR-432 ....Fixed Access Network Sharing (FANS) Business Overview
MR-433 ....Application-Layer Testing (ALT): The Key to Optimizing Quality of Experience
MU-437 ....The Future of Passive Optical Networking is Here - NG-PON2
OB-BAA-002 ....An Overview of Open Broadband - Broadband Access Abstraction
TR-069a6 ....CWMP version 1.5
TR-106a8 ....Data Model Template for CWMP-Enabled Devices and USP Agents
TR-114i3a2 ....VDSL2 Annex Q/35Mhz Performance
TR-114i3a4: ....VDSL2 Performance Test Plan
TR-115i3a1 ....VDSL2 Annex Q/35Mhz Functional
TR-181i2a12 ....Device:2 Data Model
TR-309i2: ....XG-PON and XGS-PON TC Layer Interoperability Test Plan
TR-331 ....Architecture & Technical Requirements for PON-based Mobile Backhaul networks
TR-338 ....Reverse Power Feed (RPF) Testing
TR-347: ....CPE SELT Calibration
TR-350i2: ....Ethernet Services using BGP MPLS Based Ethernet VPNs (EVPN)
TR-355a1: ....YANG Modules for FTTdp Management
TR-369 ....User Services Platform
TR-369c1: ....User Services Platform
TR-369c2: ....User Services Platform
TR-374: ....YANG Modules for Management of G.hn Systems in FTTdp Architecture
TR-383a1: ....Common YANG Modules for Access Networks
TR-383a2: ....Common YANG Modules for Access Networks
TR-384 ....Framework of Cloud in Central Office
TR-386: ....Fixed Access Network Sharing - Access Network Sharing Interfaces
TR-400 ....Testing of Bonded, Multi-Pair G.fast Systems
TR-402: ....Background of PON abstraction interface for time-critical application
TR-403: ....PON Abstraction Interface for Time-critical Applications
TR-413: ....SDN Management and Control Interfaces for CloudCO Network Functions
TR-416: ....CloudCO Use Cases and Scenarios
TR-423: ....PON PMD Layer Conformance Test Plan
TR-426: ....NG-PON2 TC Layer Interoperability Test Plan

www.broadband-forum.org

Forum Organization

Board of Directors — Board Committees

Chief Executive Officer
- Member Support
- Public Relations
- Software Architect
- Membership Development
- Chief Marketing Officer
- Meeting Management

Executive Advisory Council
Service Provider Action Council
Software Advisory Group

Marketing
- Market Requirements
- Innovation Group
- Summits / Birds of a Feather
- BASe events

Open Broadband
- OB Labs
- OB-BAA
- OB-MAP
- OB-USP-Agent
- Starfish

Councils
- Gfast
- NG-PON2
- Connected Home

Steering Committee

Technical Committee: Work Areas
- Broadband User Services
- Fiber Access Networks
- Physical Layer Transmission
- Wireless-Wireline Convergence
- Access & Transport Architecture
- Common YANG
- SDN and NFV

Leadership Groups

Broadband Innovation Group

The Broadband Innovation Group was formed as the incubator for new projects such as the developments in 5G. As envisaged in the Broadband 20/20 vision document, the Innovation Track began work on Broadband Assured IP Services. The Forum has long recognized the need for performance-assured services that are secure, standardized, on-demand and user-initiated and is leveraging several new technologies (SDN, NFV, Gfast, NG-PON2, etc.), its IP expertise and experience with more than 1 billion TR-069 installations. The Broadband Innovation Group also works with various member groups to host "Birds of a Feather" events held at most quarterly meetings.

Christele Bouchat, Nokia and Mauro Tilocca, Telecom Italia – Co-Chairs

Executive Advisory Council

Introduced in 2017, the Executive Advisory Council was established to provide an executive C-level and forward-thinking lens through which the Forum can keep an insight on industry trends to shape our future. The genesis of the Council is the profound changes in the industry - a paradigm shift both in terms of technology and methodology. The questions regarding the impact on business value and what sort of deliverables are required is the main conversation of the BBF's Executive Advisory Council.

Robin Mersh, CEO BBF - Chair

Service Provider Action Council

The SPAC (Service Provider Action Council) is a key influential standing committee keeping the Forum connected to user requirements - the key financial realities of the market. Open exclusively to the service provider membership, it offers continuous direction on requirements to ensure that strategic work has the service provider engagement needed to achieve timely standards development.

Mauro Tilocca, Telecom Italia – Chair

Software Advisory Group

The SAG (Software Advisory Group) comprises contributing Forum member companies and provides a center of software expertise acting as a "think tank" within the Forum. It advises on engagement with external SDOs and open source organizations on the processes and modeling tools needed to enable the Forum to work as an agile software-focused organization, the challenges of IPR, and balancing the Forum's role on the definition of requirements and service attributes with the implementation of code and prototyping.

William Lupton, BBF – Chair

Steering Committee

The Steering Committee's primary goal is to execute the Forum's strategy via the Work Areas of the Technical Committee. It is the main conduit for the leadership to monitor work in progress across the Forum. The Steering Committee influences the technical work and acts as a clearinghouse for new projects. It also oversees the formation of project streams (groups of related projects) and the appointment of Work Area Directors. Implementation of procedures and use of tools and the technical content of Broadband Forum meetings also fall to the Steering Committee, as well as coordination of the important items in the Forum's Liaison Program with almost every industry standards body and open source organization.

Lincoln Lavoie, UNH-IOL – Technical Committee and Steering Committee Chair

Open Broadband

Broadband Forum's Open Broadband initiative brings open source and open standards together, paving the way to dramatically change our industry and bring the full promise of broadband to fruition.

The future of broadband will be the result of the marriage between the flexibility, innovation, and speed of "open software" and with the discipline, efficiencies, and global scale made possible by "open standards".

Delivering excellent point solutions will always be critical. However, in a broadband ecosystem undergoing radical change of technology and approaches, focusing on individual elements alone is likely to be a limiting strategy. This is why the Forum is taking an approach to the drivers and technologies that feed broadband transformation to serve the industry and our members. By bringing the best ideas of open source together with the interoperability and standards required for mass market solutions, the Forum is bringing true innovation and scale to the industry.
Broadband Forum CEO Robin Mersh spoke about the importance of the Open Broadband initiative at 2018 Broadband World Forum. For a summary of his remarks, click here.

Two new Open Broadband projects began in 2018, complementing the Open Broadband Starfish project and Open Broadband-Broadband Access Abstraction (BAA) project announced in 2017. The new projects are Open Broadband Multi Access Point (OB-MAP), in conjunction with prpl Foundation, focused on intelligent Wi-Fi mesh networks, and Open Broadband User Services Platform Agent, focused on leveraging an open sources model to provide faster time-to-market for vendors and supporting operators in unlocking new revenue from IoT.

Open Broadband Labs

Open Broadband Labs offer a common hardware and software platform for an open laboratory to promote the development of network transformation and cloud evolution leveraging open source software. Each Open Broadband Lab is a collaborative industry resource that encompasses proprietary, "open" source and standard implementations coming together to represent service provider existing and planned deployments. The initial intention for the scope of the Open Broadband Labs is:

- A rich set of test resources to be used for staging, functional, performance, interoperability, testing and continuous integration of broadband NFV/SDN, CloudCo, cloud-based services and applications, management, and orchestration
- Provides the industry and BBF members with defined interfaces and reference test environment for how their products and solutions can fit into the NFV/SDN cloud-based architecture
- The Forum's motivation stems from requirements related to BBF projects and is not a constraint for third parties
- The BBF's role is to select labs based on regional requirements, available funding
- Broadband Forum does not fund each Open Broadband Lab – but helps facilitate funding (Hosting Labs are independent of the BBF and independently funded)
- OB-Labs provide services according to fair, reasonable, and nondiscriminatory terms
- Make services available to the entire industry (without limitation), platforms may vary

On May 2, 2017, Broadband Forum and SDN/NFV Industry Alliance announced the signature of a Memorandum of Understanding to jointly set up an Open Broadband Laboratory Asia. On March 11, 2019, Broadband Forum and EANTC announced the opening of a second lab (Open Broadband Laboratory Europe, or OBL-E).

Interop and Certification

Since its inception the Forum has had an objective to establish interoperability in the broadband marketplace. Today, the Broadband Forum Interoperability and Certification program encompasses end-to-end broadband testing requirements including fiber, DSL, MPLS and home
networking related interoperability and conformance testing.

The BBF Testing and Certification programs include:

1.   Developing common test requirements
2.   Establishing a test suite which normally includes functional and performance tests
3.   Hosting test events also know as plugfests, which can include private members only multivendor plugfests, conformance testing, public interoperability demonstrations and/or certification

Certification Program Impact

- Creates confidence and minimizes risks
- Establishes a trusted industry standard for implementation and high customer satisfaction
- Leverages vast experience and expertise
- Avoids extensive provider testing before purchase
- Significantly reduces costs and accelerates time to revenue for all stakeholders
- Provides a starting point for service provider integration and fosters a diverse marketplace across silicon and products

Broadband Forum Certificate Program

Broadband Acceleration Seminar (BASe) Series

Broadband Forum is the industry's most respected organization for accelerating broadband innovation and deployment, and its fast-growing Broadband Acceleration Seminar (BASe) series provides key insights into the state of broadband innovation, technology, standards, and ecosystems. Held in conjunction with major industry conferences, each BASe event draws hundreds of key influencers from global broadband service providers, suppliers, analysts, and government officials who appreciate our uncompromising educational focus and our member's leading-edge perspectives. Composed of 3 different event profiles, BASe series touches upon the areas of focus of the Forum – 5G, Connected Home, Cloud, and Access | Next – and provides sponsors with unparalleled access to broadband.

Technology Councils

The charter of each technology council is to foster the global market development of its representative technology through educational and awareness initiatives.

Each council, the Gfast Council, the NG-PON2 Council, and the Connected Home Council, was formed to centralize and disseminate the expertise and experience of each respective market in order to facilitate the rapid deployment of each technology. Each council meets regularly, and develops a roadmap for educating the market on their respective technology and providing deployment updates. Typical vehicles are formal published Market Updates, technology White Papers, webinars, wall charts and surveys. In addition, the technology councils are very active as content engines in developing content for BASe events and moderating BASe panels. Lastly, as the technology councils are monitoring market trends and conducting surveys, they provide use case ideas back into the working areas and interoperability/certification programs to stimulate market expansion and ecosystem development.

Examples of Market Updates created by technology councils include:

Recognizing Member Contributions

The BBF recognizes the outstanding contributions of those who have shaped the growth of Broadband, worldwide

Distinguished Fellow Award

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

2018 Recipients:
Lincoln Lavoie, UNH-IOL

Circle of Excellence

The Broadband Forum recognizes the exceptional contributions of its members through the "Circle of Excellence" award, which is awarded at our annual meetings.

2018 Recipients:
Bruno Cornaglia, Vodafone

Marcos Martinez, Maxlinear

Outstanding Contributors

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 work areas.

2018 Recipients:
Nick Hancock, ADTRAN

Yuanlong Jiang, Huawei Technologies Co., Ltd.

Georgios Karagiannis, Huawei Technologies Co., Ltd.

Ludwig Pauwels, Nokia

Marco Spini, Huawei Technologies Co., Ltd.

Yuanlong Jiang, Huawei Technologies Co., Ltd.

visit https://www.broadband-forum.org/contributors for information on BBF member recognition

Participating Organizations

2018 saw an increase in membership and participation. Below is a list of member companies organized alphabetically by membership level. Please note that Open Broadband initiative projects include a wide variety of non-member companies and industry organizations not listed.

PRINCIPAL LEVEL

5V Technologies, Ltd.
A1 Telekom Austria AG
Actiontec Electronics
ADTRAN
ADVA Optical Networking Ltd
Advanced Digital Broadcast S.A.
AEPONYX
Altice Labs, S.A.
Arris
ASSIA, Inc.
AT&T
AVM Audiovisuelles Marketing und Computersysteme GmbH
Axiros
Bell Canada
BiFrost Communications
Botswana Fibre Networks
Broadcom Corporation
BT
Calix Networks
Cambridge Industries Group Limited
CenturyLink
Charter Communications
China Mobile Research Institute
China Telecom Global Limited
China Unicom
Chunghwa Telecom Labs
Ciena
Cisco Systems
Comcast
CommScope
Corning
Cyta
Deutsche Telekom AG
D-Link
Domos AS
Dual Beam Merger Ingenieros Sl
EANTC
Econet (Suzhou) Limited
Eircom Limited
Ericsson
EXFO Inc
FASTWEB SPA

Fujitsu Limited
Genesis Technical Systems
Go Foton
GreenWave Systems
Huawei Technologies Co., Ltd.
Hybrid Access Technologies
InCoax Networks AB
Incognito Software
Integrated Silicon Solution Israel
Intel
Inteno (Genexis BV)
Juniper Networks
Keymile
LAN
Luster Teraband Photonics Co., Ltd.
Maxlinear
Metanoia Communications
Microsemi
MT2 SAS
National Broadband Network
NEC
Nokia
NTT Corporation
Octoscope
Orange
OutSys
PIC Advanced SA
Predictable Network Solutions Ltd
Proximus
QA Cafe
Qualcomm Incorporated
RAD Data Communications
Radisys Corporation
Sagemcom Broadband
Samsung Electronics Co., Ltd.
Sckipio Technologies
SK Telecom
Sky plc
SmartRG, Inc.
SoftBank Corp
Sparnex Instruments
Sumitomo Electric Industries
Swisscom (Schweiz) AG
TalkTalk Group PLC
TDC A/S
Technicolor

Telebyte, Inc.
Telecom Italia S.p.A
Telefonica S.A.
Telekom Malaysia R&D
Telenet NV
Telkom Indonesia
Tellabs
Telstra Corporation Ltd
Telstra Corporation Ltd
TELUS Communications, Inc.
Tessares
Tibit Communications
Ubilinx Technology, Inc.
UNH InterOperability Lab
Verizon
Viavi Solutions
VM Ware
Vodafone Group Services
Volt Server
ZTE Corporation

AUDITING LEVEL

Arcadyan Technology Corp.
Askey Computer Corp.
BQ
Casa Systems
Chengdu Superxon Communication Technology Co., Ltd. (Superxon)
DASAN Zhone Solutions
Fiberhome Telecommunications Technologies CO., LTD.
Foxconn Industrial Internet (FII)
Friendly Technologies (FTL) Ltd.
Furukawa Latam
Gemtek Technology Co.
Greenlee Communications
Hisense Broadband Multimedia Technologies Co.,Ltd.
Icotera
Inango Systems Ltd
Infinera
Intec
JABIL CIRCUIT (SHANGHAI) COMPANY LTD
Kurth Electronic GmbH
LEA Networks

Methode Electronics
Observa Telecom
SaskTel
Seliro
Sercomm
Teldat
Telekom Slovenije, d.d.
Telenor Norge As (SY)
Telkom SA Ltd
Triductor Technology
Westermo
Wistron NeWeb Corp.
Works Systems (Tianjin) Co., Ltd.
Zyxel Communications Corporation

ASSOCIATE LEVEL - INFLUENCER

Broadband Communications Chamber of Ghana
Cable Labs
China Academy of Information and Communications Technology (CAICT)
Continental Automated Buildings Association (CABA)
Easy CWMP
ETRI
Fraunhofer Institute for Embedded Systems and Communication Technologies ESK
Industry Development Augmentation Division
Informa T & M (Broadband World Forum)
Layer123
Mocalliance (MoCA)
National Exchange Carrier Association
National Media and Infocommunications Authority
Point Topic
TNO
Trinity College Dublin

Financial Report

Auditors John Waddell & Co, Certified Public Accountants, conducted the audited of the 2018 Broadband Forum financial statements. The following tables provide an overview of the financial position and key financial metrics of the organization at the close of 2018.

Statement of Financial Position
December 31, 2018
(With Comparative Totals for December 31, 2017)

ASSETS		
	(Audited) 2018	**(Reviewed) 2017**
Cash	$ 510,696	$ 495,467
Accounts receivable	10,662	1,450
Prepaid expenses and deposits	56,554	45,955
Website, net of accumulated amortization	9,954	5,491
Investment in marketable securities	1,317,798	1,358,306
	$ 1,905,664	$ 1,906,669
LIABILITIES AND NET ASSETS		
Liabilities		
Accounts payable	$ 217,689	$ 288,766
Deferred membership dues	505,600	401,600
Total Liabilities	723,289	690,366
Net Assets		
With donor restrictions	16,083	16,083
Without donor restrictions		
Designated for reserves	1,000,000	1,000,000
Undesignated	166,292	200,220
Total Net Assets	1,182,375	1,216,303
	$ 1,905,664	$ 1,906,669

Statement of Activities
For the Year Ended December 31, 2018
(With Comparative Totals for December 31, 2017)

	Without Donor Restrictions	With Donor Restrictions	(Audited) 2018 Total	(Reviewed) 2017 Total
Revenue				
Membership dues	$ 1,476,337	$ -	$ 1,476,337	$ 1,306,873
Meeting fees	187,275	-	187,275	206,730
Sponsorship fees	79,625	-	79,625	60,500
Interest and investment income (loss)	(38,238)	-	(38,238)	89,419
Other income	-	-	-	3,000
Net assets released from restriction	-	-	-	-
Total Revenue	1,704,999	-	1,704,999	1,666,522
Expenses				
Program services:				
Meetings	613,499	-	613,499	699,749
Member services, tools, and other	141,785	-	141,785	181,791
Trade shows, marketing and PR	523,068	-	523,068	392,960
Total program services	1,278,352	-	1,278,352	1,274,500
General and administration	460,575	-	460,575	644,329
Total Expenses	1,738,927	-	1,738,927	1,938,829
Change in Net Assets	(33,928)	-	(33,928)	(272,307)
Net Assets				
Beginning of Year	1,200,220	16,083	1,216,303	1,488,610
End of Year	$ 1,166,292	$ 16,083	$ 1,182,375	$ 1,216,303

![broadband forum logo]

BBF Team

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Software architect | William Lupton| wlupton@broadband-forum.org
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Media and public relations | Brian Dolby | brian.dolby@proactive-pr.com

Links and Contacts