BROADBAND
Bits & Bytes

A BIF Communiqué

Contents

Foreword

Mr. P K Garg
Principal Adviser,
Broadband India Forum

The Government of India has launched an ambitious and highly laudable program of 'Digital India' to steer the country and its citizens towards inclusive empowerment in the modern era. Coupled with this are related programs & efforts for 'Broadband for all', Optical Fiber Cable (OFC) Network to reach 250,000 Village Panchayats, digital identity for citizens, Smart Cities and Wi-Fi Hotspots at large number of important public places, etc.

Broadband India Forum is making tremendous efforts to create awareness about government objectives under these programs as well as to organize constructive conferences, seminars and discussions among various stakeholders as to how best to achieve these national objectives.

The need for a robust infrastructure for taking these beneficial programs to country's masses, hardly needs to be stressed. In a vast country like India, with diverse terrain, all types of infrastructure have to complement each other. The telecom infrastructure can overcome, to some extent, the inadequacy of other physical infrastructure like roads, as well as essential social services like agriculture, health and education, etc, especially in rural and remote areas.

For the telecom network also, a judicious mix of all mediums – terrestrial and space, wireless and physical line medium (including OFC), have to play a complementary role to each other, to meet the gigantic needs of the nation for this digital objective. The laying or extension of OFC network to 250,000 Village Panchayats is taking relatively long time, despite all efforts by the government agencies. All existing and upcoming parts of telecom network – satellites, cellular networks of different generations (2G, 3G, 4G, etc.), microwave links, Wi-fi networks and all other type of networks available with various organizations – public or private, should be beneficially utilized to expeditiously provide broadband, or at least internet facilities, to all areas and citizens, as a part of this digital drive. As and when the OFC network becomes operational in an uncovered area, the capacity of other networks can be either transferred to other areas, if possible, or act as a standby till the OFC network stabilizes. Some of the areas would have to depend on the satellite connectivity for a long time.

In this regard, it is worth recalling that the telecom revolution in India during early part of this century, was achieved with the help of facilitating role of the government (policy maker) and the telecom regulator, coupled with innovative approaches adopted by various telecom operators, who were encouraged by the government's collaborative intent to remove all impediments in the growth of the telecom network. The present broadband eco-system in the country is in a similar situation and facing somewhat similar challenges. A collaborative approach between the government, regulator and telecom operators adopted earlier with brilliant results, can greatly help in spreading the broadband services also country-wide in an expeditious manner.

The fierce competition in the cellular data services, has resulted in tariffs going very low and data consumption in the country becoming the highest globally. It is also observed that a very large part of the data usage is for entertainment & video services. Hence, along with fast spread of the digital network, there is an urgent need for developing appropriate data apps. in vernacular languages, which can benefit the youth to enhance their capabilities and earnings as well as take the health, agriculture, education and other government & social services to the entire country, for a truly inclusive society.

"DIGITAL INDIA" TO STEER THE COUNTRY AND ITS CITIZENS TOWARDS INCLUSIVE EMPOWERMENT IN THE MODERN ERA

TV Ramachandran
President,
Broadband India Forum

> **BIF IS DEDICATED TO ENHANCE THE POTENTIAL OF THE ENTIRE ECOSYSTEM TO DELIVER BROADBAND ACROSS THE WHOLE OF INDIA**

From the President's Desk

Dear Readers,

Welcome to the Second Edition of our Quarterly Newsletter for FY19 – Broadband Bits & Bytes on trends and perspectives related to Broadband sector in India. The Newsletter focusses on all the key areas such as spectrum and licensing, content and applications, SatCom, infrastructure, security, new technologies and innovations, which could lead to proliferation of Broadband in India.

BIF is dedicated to enhance the potential of the entire ecosystem to deliver broadband across the whole of India. BIF's mission is to support and enhance all policy, regulatory & standards initiatives for the proliferation of high quality broadband in the country in a technology-neutral and all-inclusive manner. We have, in the short time frame of less than three years, contributed to several regulatory and policy consultations and been working closely with all concerned Government agencies providing credible inputs on Broadband to assist and facilitate the process of policy making.

The Newsletter is divided into several sections. In the "Spotlight" section, the focus for this Edition is Digital Infrastructure. We discuss the several vital elements that comprise Digital Infrastructure. We have views on what are the various elements of Digital Infrastructure which are crucial for the dream of Digital India in the "Industry Speak" section, and I would like to thank the industry experts personally for sharing their valuable thoughts. In our "Newsflash" section, we have summarized the significant happenings in the Broadband sector over the last quarter. In the "Events" section, we give you a glimpse of the past and proposed BIF Events.

In an effort to make this newsletter more useful to you, we would appreciate your comments and suggestions that you may have on this issue as well as topics that you would like us to feature in the forthcoming issues.

Happy reading!

SPOTLIGHT:
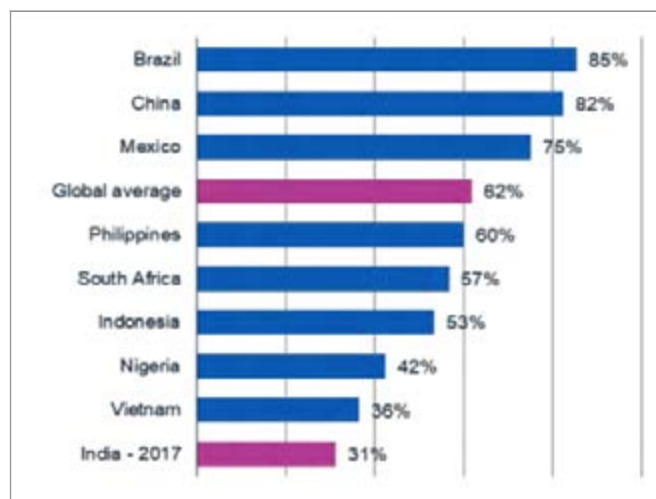# Digital Infrastructure Comprises of Several Vital Elements

Optic Fibre, E and V Band, Satcom, Public Wi-Fi and Towers - All Essential to build Digital India

By TV Ramachandran

Slowly but surely, Digital India, where every Indian is digitally empowered and information is digitally available, is unfolding. The flagship programme of the Government of India is about empowering people, generating employment opportunities, promoting entrepreneurship and most importantly, enhancing the overall quality of life. For instance, Digital India will go a long way in ensuring access to essential healthcare and education. According to a report by United Nations, 74% of doctors are in urban areas that serve the 28% of the population while the rest 26% serve the rural population (72%). As per the Annual Status of Education Report, nearly one fourth of rural India's youngsters aged 14-18 cannot read their own language fluently. This gap can be bridged through digital enablement.

The importance of ubiquitous digital infrastructure for efficient delivery of both traditional and modern services cannot be overstated. Although India's Mobile Broadband (MBB) penetration has witnessed an impressive growth over the last couple of years, it is significantly lower than many of the developing markets as shown in Fig1 below. There is therefore great urgency in creating good digital infrastructure in a ubiquitous manner. For a highly diverse country with varying geographies and many remote and inaccessible parts, ubiquity demands a holistic approach to infrastructure. **While towers and antennae would remain a major element, the role of optic fibre would be further enhanced to all-pervasive, essential status and the importance of Public**

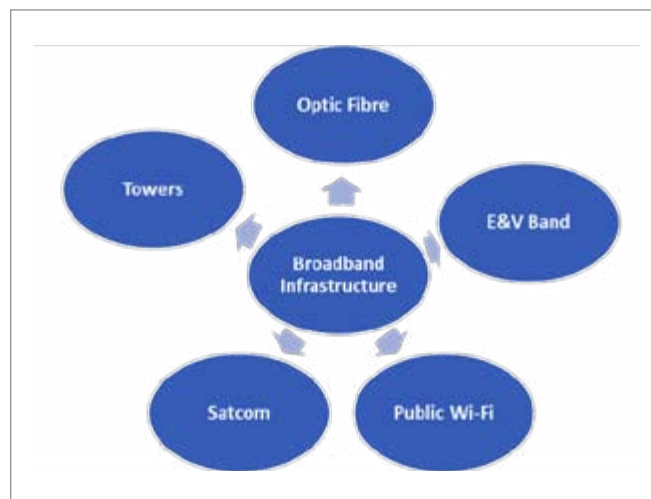## Fig 1: MBB penetration by country (Dec 2017)

Source: GSMA Intelligence, Analysys Mason, 2018

WiFi Hotspots, E&V Band 'Wireless Fibre', assume high proportions (Fig 2 below). As India moves forward achieving a vision of transforming India into a digitally empowered society and knowledge economy, the need for large investments in all types of digital infrastructure is imperative. Digital Infrastructure needs to increase threefold in next five years to help achieve the goal of trebling GDP to USD 7.5 trillion over the next five years. This requites investment to the tune of USD 100 billion in digital infrastructure.

The availability of more than one type of digital infrastructure at any one place helps ensure that there is no dependency on just one system and switching traffic is easier between them in case of emergencies or disasters, natural or otherwise. This is essential for India.

Fig 2: Elements of Broadband Infrastructure

Broadband is at the heart of the Draft National Digital Communications Policy (NDCP) released in May 2018. **The policy addresses broadband infrastructure as its very first objective – 'Connect India'.** The Policy rightly recognises that the Digital era cannot happen without India marching towards "Fibre First" Initiative that constitutes setting out a system of optical fibre links throughout the nation for fast internet. Laying of 2,74,246 km of optic fibre connecting 1.15 lakh gram panchayats under BharatNet, steady increase in number of base stations and towers, the massive push to increased fiberization of towers, the tremendous thrust to link up homes with fibre (FTTH) - all these initiatives are humungous by any global standard. Success in these will greatly decide

the course of modern India. It must be admitted that the task is daunting and formidable. We are starting from quite a backward situation and need to exert superhuman efforts to help bridge the huge yawning gap in digital infrastructure in comparison with other leading nations.

The US has installed over 400 million km of fibre for less than one-third of our population and China has over a billion km of fibre, while India has deployed only about a 100 million km; i.e. just a tenth of what they have achieved. While India deploys only 15 million km of fibre per year, China adds about 150 million km of fibre per year. Thus, the existing gap only keeps getting wider and wider every year and India is falling further behind. Even the current 250 million Indian 4G subscribers are greatly underserved and increasing fibre optic networks is the optimal solution.

India aims to be at the forefront in 5G ie to commence rollout by 2020. There is much excitement in the regulatory industry and academia ecosystem, but also formidable handicaps to be overcome. The percentage of fiberization of mobile towers is an example. While comparable regimes like the US and China have over 80% of their towers fiberized, India experiences the inverse—only around 20-25% of towers are fiberized. For 5G, 100% of the towers would need to be fiberized. Another aspect not much realized is that, with 5G, the requirement of macro-towers would reduce but that of micro-towers and so-called 'street furniture' would rise sharply with attendant optic fibre and 'wireless fibre' connectivity requirements. These could present fresh rollout challenges.

Fibre may not reach all these places. There is a need to deploy reliable high speed BB services in a quickest possible time to distribute digital fruits. **Alternate and cost effective technologies are the only solution to build inclusive digital India. E and V band technologies are rolled out world over to build high capacity BB networks in both urban and rural areas.** The reference to E and V bands in the Draft Policy under Promoting Next Generation Access Technologies is a encouraging sign, in view of the huge data growth and the need for quantum growth of Broadband & Digital Communications infrastructure, the Government should recognize the need

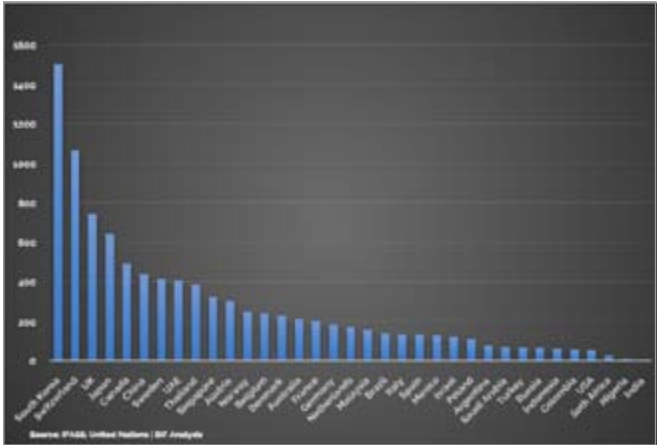### Fig 3: Data traffic on handsets offloaded through public Wi-Fi networks

Source: Analysys Mason 2018

for opening up unrestricted, delicensed access to the entire V band from 57-71Ghz and not up to 64Ghz only.

The country is also seriously deficient in much needed Public Wi-fi hotspots. Evidence from international markets indicates a strong demand for public Wi-Fi networks. Developed markets such as USA, UK and France have 30% of their total public data offloaded to public Wi-Fi networks.
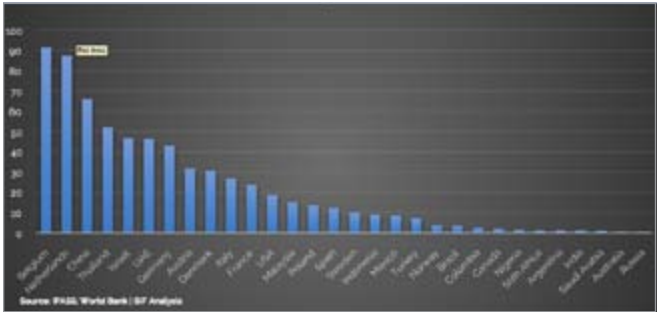
The following graph demonstrates India's position against 34 other nations, big & small, and is illustrative of a simple truth. At approximately 2.68 hotspots for every 1,00,000 people (or one hotspot for approximately 37500 people), India fares far poorly in comparison to other nations. Nigeria, South Africa and USA all have far more impressive averages than India at 7.25, 27.17 and 51.86 hotspots per 1,00,000 people respectively.

Fig 4: Hotspots per 100,000 people

The following graph illustrates the relative positions of these nations when compared for the rollout of hotspots as a function of land mass. India performs poorly here also.

Fig 5: Hotspots per 100 Sq. Kms

The Draft National Digital Communications Policy (NDCP) targets to supply 5 Mn Wi-Fi hotspots by 2020 and 10 Mn by 2022. For India to reach today's global average of 1 hotspot for 150 persons, India would need another 8 million hotspots. Liberalization of Public Wi-Fi Policy is a refreshing new approach that is direly needed in India. A positive and pragmatic regulatory framework for the Wi-Fi industry is a must as it ensures that the demand and supply ecosystems

are adequately empowered, undue restrictions to innovation are removed while investments and partnerships are encouraged.

Another area of under-exploited potential for digital inclusion in India is that of Satellite Communications. There is little realization that 10 Gbps of data bandwidth is going waste all over India from satellites while Rural India remains starved of connectivity. **Satcom is quick and economical to deploy in rural areas as compared to terrestrial technologies.** There is enormous scope for improvement in the area of Satcom, which can become far more affordable through the adoption of modern technologies and through optimized policies & regulation. For the first time, this unexploited sector has received elaborate and fair treatment in the NDCP.

Implementation of NDCP in letter and spirit will play a crucial role in ensuring ubiquitous broadband in India. To achieve the stated goals, there is a need for creation of National Mission for Sustainable Digital Infrastructure which embraces all the elements described above which should concomitantly have

Fig 6: Cost of roll-out of terrestrial technologies in dispersed areas increases with remoteness

a Digital Infrastructure Fund to provide low cost access to the large funds required. Achievement of Digital India could be a serious challenge without this Mission and the Fund.

Author is Hon. Fellow of IET(London) and President of Broadband India Forum. Views are personal. Research inputs provided by Garima Kapoor.

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Industry Speak:

"For India to be able to realise the vision of seamless digital connectivity, it needs to ensure that all dimensions of digital infrastructure is nurtured and promoted, which includes spectrum, optical fibre network, BTS sites, etc. This will ensure that our overall objectives are not diminished and the consumer is empowered with the best in class services to unlock his dreams."

Parag Kar
Vice President,
Government Affairs,
India & South Asia,
Qualcomm

"A sound digital infrastructure will need pervasive networks, relevant and quality content, as well as appropriate affordable devices. India is fortunate to have world class domestic and international players in each segment. Policy and regulation should aim to remove any or all barriers to innovation and investment which cannot be justified based on consumer protection or national interest."

Mahesh Uppal
Principal Adviser,
BIF

"The NDCP Policy Document emphasis on Digital Infrastructure as the Bedrock of Digital India and the Policy initiative of Enhancing the Scope of IP1 Players to Allow and promote Sharing from just passive elements to passive and active elements augurs very well for the Industry as I can see the Potential for the Emergence of the NETCO Model of Infra sharing viz End to End Infra Sharing. This Partnership Model between Netcos and Opcos will bring in Cost Optimisation, Faster Roll Outs of Networks and more Productive Use of Financial Capital". In short, a Win Win Model for All!"

Umang Das
Special Adviser,
ATC India

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Newsflash:
Updates and Achievements

SPECTRUM & LICENSING

- TRAI released Consultation Paper on Methodology for levy of Spectrum Charges for provision of Satellite based Services using Gateway installed in India under 'sui-generis' category.

- BIF has formed a 5G spectrum working group to discuss spectrum requirements for 5G and its trials.

5G

- A report on the 5G in India prepared by the 5G Steering committee was released in August 2018.

- The 2nd High level committee meeting of BIF was held on October 12, 2018to update the members on the status of the 5G Trials in India.

CONTENT AND APPLICATIONS

- BIF submitted its comments on the draft Personal Data Protection Bill (PDP) in October 2018.

- BIF was knowledge partner for the event hosted by Bharat Exhibitions on 5th International Conference on Data Centre India 2018. The event was held at the hotel Shangri La, New Delhi on October 04, 2018.

- TRAI has released Consultation Paper on Regulatory Framework for Over-The-Top (OTT) Communication Services.

DIGITAL INFRASTRUCTURE

- BIF is going to host an event along with ADBI Institute and ICRIER on Digital Infrastructure in December 2018.

- ICRIER-BIF report on the second order effects of mobile and broadband on Indian Economy will be released during the event.
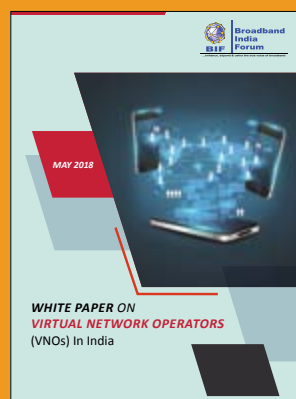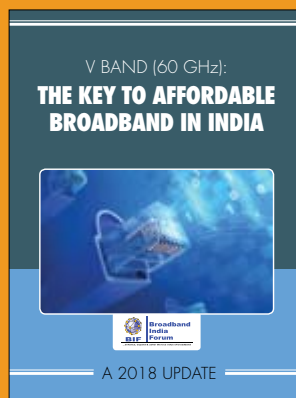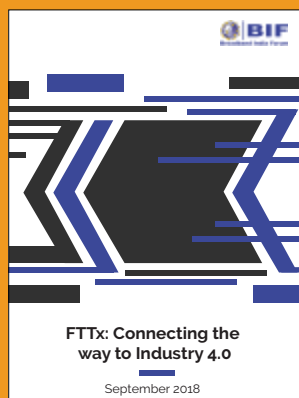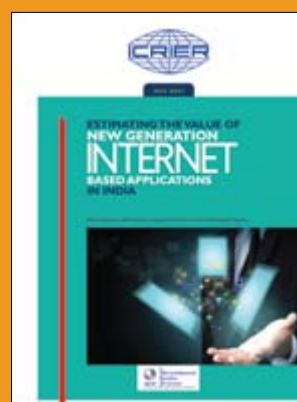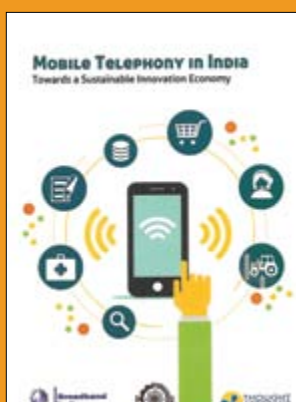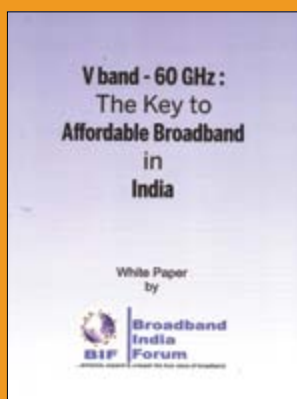
SATCOM 2018

- BIF along with ICRIER and Bharat Exhibitions is hosting the 4th International India Satcom 2018 Summit. The event will be held at Le Meridian, New Delhi on Nov 20-21, 2018.

- On the occasion, a report by ICRIER on, "Liberalising Satellite Communications in India: Opportunities for Enhanced Economic Growth" will be released.

OTHERS

- NDCP 2018: The Cabinet approved the National Digital Communication Policy 2018 in Sep 2018.

- OFC: BIF along with Bharat Exhibitions hosted the 2nd edition of the FTTH India Summit. The event was held at The Leela, Mumbai on 28th September 2018. On the occasion, a White Paper on 'FTTX: Connecting the way to the Industry 4.0' was released.

- AI: BIF organized a session on role of AI for rural sector on October 10, 2018 at Le Meridien, New Delhi.

- IoT: BIF was actively part of the 3rd IoT India Mobile Congress held at Bengaluru on October 09-10 2018. BIF is going to host an event along with Bharat Exhibitions on AI and IoT in December 2018.

- Wi-Fi: BIF along with DigiAnalysys released a White Paper on 'Liberalisation of Wi-Fi' at the event hosted by DigiAnalysys- 'My India Wi-Fi India Summit & Awards 2018'. The event was held at The Imperial Hotel on Sep 06, 2018.

  Smartphones: BIF is going to host an event on Smartphones and Customer Experience on Nov 27, 2018. The event will also see release of the report on Smartphone Performance in India developed by PhiMetrics Technologies Pvt. Ltd.

Reports & White/V Band Papers from BIF

Interesting Articles

- ❖ India's 5G dream can only become a reality once adequate fibre connections are installed, as the country significantly lags on this front. [LINK]
- ❖ Coping with the great data deluge. [LINK]
- ❖ National Digital Communications Policy 2018 reaching brilliant conclusion, to propel growth of fixed line communications in India. [LINK]
- ❖ Telecom Industry Scaling New Heights Of Excellence In 2018-19. [LINK]
- ❖ India may be wrong in insisting on storing user data locally; storage not same as control. [LINK]
- ❖ Public Wi-Fi: The next giant digital leap India needs to take or risk being left behind. [LINK]
- ❖ Why telcos must ring in blockchain tech?. [LINK]
- ❖ TRAI's little-known pro-customer ruling is a tech-based trailblazing measure to end menace of pesky calls and SMSs. [LINK]

FEW OTHER ARTICLES THAT YOU MAY FIND INTERESTING:

- ❖ Enabling 5G technology in India [LINK]
- ❖ Streamlining Policy: NDCP, 2018 set to steer the country into a digital era. [LINK]
- ❖ Fibre to Everything: FTTx emerges as the network of the future. [LINK]
- ❖ National Digital Communication Policy 2018 – The Hits And The Misses [LINK]
- ❖ USD 10 Trillion Indian Economy: Powered By Next-Generation Telecom. [LINK]

Events:
Upcoming Events

Digital Infrasturcture

6th DECEMBER 2018
The Taj Mahal Hotel, Manshing Raod, New Delhi

Artificial Intelligence Event
BIF as Knowledge Partner

14th DECEMBER 2018
Shangri-La Hotel, New Delhi

India Satcom 2019

India Satcom 2019

International Summit - "India SatCom"

India SatCom 2019 – 5th International SatCom Summit – to be organized by the Broadband India Forum, offers a unique opportunity to access key decision makers and business leaders driving the development of Satellite Broadband in India. Register today to gain the knowledge and contacts you will need to make your company part of this growing market for satellite communications services.

The 5th International Summit - India SatCom
November 2019 at New Delhi

Events: Past Events

11th AGM and Anniversary Celebrations of IPTV Society (BIF) concluded successfully

AI for Rural Sector

Data Protection

BIF as Knowledge Partner at 5G Event in Mumbai

Launch of White Paper on V Band

India Satcom - 2017

Launch of BIF-TARI Report -
Mobile Telephony in India

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Dr. B M Baveja

Mr. Sudhir Gupta

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Mr. Rajesh Mehrotra

Mr. D P Singh

Mr. Abhishek Malhotra

Mr. K V Seshasayee

Mr. Pranjal Sharma

About Broadband India Forum

Mr. Anil Prakash
Director General
Broadband India Forum

Broadband India Forum (BIF) functions as a policy-forum and think-tank that works for the development & enhancement of the entire broadband ecosystem in a holistic technology-neutral and service-neutral manner. BIF seeks to be a thought leader and a credible and effective voice to help propel the nation to achieve the country's ambitious vision of creating a Digital India. To achieve this, BIF works to promote the rapid development of policies to promote affordable and high speed ubiquitous broadband throughout the country.

Registered as IPTV Society, its brand – BIF was formed in October 2015 and is a fairly nascent but dedicated Forum with participation from all stake holders, including Technology Providers, Telecom Operators, Internet Service Providers, Value-Added Service Providers, Satellite Operators and service providers, MSO, Broadcasters, startups and professional entities as well as seasoned Industry professionals who are familiar with different technologies, operations, regulations and policies.

The Forum's senior leadership team includes renowned and respected professionals from background of Industry, Regulator and Government.

1. Mr. Shyamal Ghosh, Former Secretary-Telecom and co-founder of IPTV Society, is the Chairman Emeritus.

2. Mr. M. F. Farooqui, IAS (Retd.), former Secretary-Telecom, is the current Chairman

3. Mr. T. V. Ramachandran, Hon. Fellow of the IET (London), former Resident Director-Regulatory Affairs and Government Relations, Vodafone, and first Director General of COAI, is the President of the Forum.

4. Mr. Parag Kar, Sr. VP Govt. Affairs, India and South Asia-Qualcomm and Mr. Ashwani Rana, Head Connectivity Policy-Facebook are current Vice Presidents.

5. Mr Anil Prakash is the Director General.

6. Mr. S. N. Gupta, seasoned technocrat and senior luminary who has worked in DoT and as a Principal Adviser to TRAI (Regulator) is the Treasurer.

BIF functions through many specialist committees for the advocacy, coordination, facilitation and promotion of all activities with the objective of furthering the goals of the National Telecom Policy in Spectrum, Licensing and Standardisation, Broadband Infrastructure, Manufacturing Rural Digital Initiatives, Content & Applications, SatCom & Broadcasting, 5G, New Technology & Innovations, IoT and ICT for Inclusive Ability.

The activities of the Forum broadly relate to coordination, promotion and formulation of expert opinion on topical subjects related to Broadband. To act as a bridge between Industry on one side and Government and the Regulatory Bodies on the other, front ending several issues related to policy & regulation.

> *"In the sixth Edition of the Newsletter, Broadband – Bits and Bytes, our endeavor is to keep you updated with latest technology, standards, innovation, policy and regulation, which embark on and facilitate speedy and affordable broadband proliferation in the country."*
>
> *- Anil Prakash*

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Garima Kapoor, Arun Mukarji and Abhijit Panicker

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