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C. Grundemann  
J. Zorz  
Internet Society  
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**Operators and the IETF**  
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Abstract

Internet Society has launched a new project to address the perceived gap between Operators and the IETF. The objective of this project is ultimately to facilitate communications between the operator community and the IETF to help ensure that operational realities inform the development of key standards. The first phase of this project was a survey of the operator community that was conducted over the first half of 2014. This I-D aims to synthesize the initial survey results, along with information we collected directly from operators during the survey window. The primary purpose of doing this is to start a conversation which we hope will lead to increases in the level of operational input and feedback to the IETF standards making process.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

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## **1. Introduction**

The Internet Engineering Task Force (IETF) is an open standards organization concerned primarily with developing and promoting open Internet standards, with the goal of making the Internet better. Their goal, mission statement, and cardinal principles are documented in [\[RFC3935\]](#), [section 1](#).

In a perfect world, the IETF would create standards for protocols that meet all relevant network operator requirements, sync with operational realities, and are relatively easy to deploy and troubleshoot. In this perfect world, deployment and operationalization concerns are consistently addressed and the level of operator engagement always makes sense. Operators always know when their input is needed and always provide that needed input. In reality, though, many operators are not engaged enough in the IETF to create that perfect world. It's widely understood that a significant portion of operators (particularly small- to mid-size) don't join IETF mailing lists or attend IETF meetings, effectively writing themselves out of the process. This leaves vendors, academics, and some large organizations to rule many decision-making processes within the IETF. The operators expected to deploy these technologies often don't even know that the standards are being developed. In other words, critical new technologies are currently being developed without sufficient direct operator input.

This disparity is not new, nor has it gone unnoticed. Nine years ago this month an essay by Randy Bush was published in ACM SIGCOMM Computer Communication Review. It's titled "Into the Future with the Internet Vendor Task Force: A Very Curmudgeonly View - or - Testing Spaghetti - A Wall's Point of View" and it calls out this very issue of "the devaluation of operational realities."

However, with the advent of OpenFlow, Software Defined Networks (SDN), Network Function Virtualization (NFV), and an overall trend toward open source, particularly open application programming interfaces (APIs), in the network space, this disparity may now be seen as related to a larger and growing problem. If open APIs become the de-facto definition of interoperability requirements, the role of the standardization bodies, and the opportunity for operators to influence specifications, diminishes. As a result the functional interoperability (and interchangeability) of vendors and devices will decrease, potentially leading to a more proprietary and less open and global nature of the Internet.

In response, the Internet Society has launched a new project to address the perceived gap between Operators and the IETF. The objective of this project is ultimately to facilitate communications



between the operator community and the IETF to help ensure that operational realities inform the development of key standards. We want to foster a larger and more engaged operator community around the IETF and protocol development work. To ensure that we take the most effective action, we focused initially on talking to operators around the world, gathering information and defining the problem statement(s). The first phase of this project was a survey of the operator community that was conducted over the first half of 2014. The survey closed on 1 July with over 350 responses.

This I-D begins the next phase, which we hope will lead to productive improvements to the level of operational input into the IETF processes. The primary purpose of this paper is to synthesize the survey results, along with information we collected directly from operators during the survey window.

In the next section we take a quick look at the survey respondents, including their roles and their relationships to the IETF. Then, under the following section, Potential Challenges, we delve into the reasons respondents gave for not participating in the IETF. What are their personal challenges to injecting more operational reality? We then move on to discussing ideas for overcoming these obstacles in the next section, Possible Solutions. In all cases, we are primarily reporting on the results of the Operators and the IETF survey, open from January through June 2014 and the text may not necessarily reflect the views of the Internet Society.

## **2. Survey respondents**

Before diving into what the survey respondents said, and what that might mean, let's first take a look at who these respondents were.

### **2.1. Job type**

The first set of questions dealt with the respondents' role. We wanted to ensure that we reached our target audience - technical network operators. A note on our use of the term "operator:" In the survey, in this paper, and throughout this Operators and the IETF project, we use the term operator to mean anyone who operates an IP network. This includes Internet service providers (ISPs) but also content providers, data centers, enterprises, wireless networks, campus networks, and everything in between.

- o I'm an Operator - 44% strongly agree and 34% agree, 12% disagree and 10% strongly disagree.



- o My role is primarily technical - 63% strongly agree and 29% agree, 9% disagree and 2% strongly disagree.

The respondents were overwhelmingly technical and the vast majority were operators. We also drilled into specific roles of respondents:

- o I'm an Engineer - 60% strongly agree and 32% agree, 5% disagree and 3% strongly disagree.
- o I'm an Architect - 42% strongly agree and 38% agree, 14% disagree and 6% strongly disagree.
- o I'm an Developer - 9% strongly agree and 29% agree, 39% disagree and 23% strongly disagree.
- o I'm an Manager - 24% strongly agree and 26% agree, 27% disagree and 23% strongly disagree.

92% of respondents self-identified as engineers and 80% as architects, while only 38% said they were developers and about half said they were managers.

## **2.2. IETF Involvement**

The next set of questions dove into the respondents' current level of participation in, and awareness of, the IETF.

Exactly half of the respondents reported that they did NOT currently participate in the IETF at all. Almost one third said they participate in the IETF via mailing lists only. Only about 18% reported that they were active in the IETF via both mailing lists and in-person meetings. This is about the mix we were expecting.

Since we are looking primarily for challenges and obstacles to participation, we wanted to hear from the people who do not participate. Mixing in some people with more experience on how the IETF works today helps provide useful context, though. We then asked each group of respondents more detailed questions about their level of awareness, based on their participation level in the IETF.

### **2.2.1. Do not currently participate in the IETF**

Among those who do not currently participate in the IETF at all, a wide majority know that the IETF exists, know what it does, find IETF documents relevant to their jobs, and feel that they need to participate.

So why aren't they showing up? Other responses within this set of





questions provide clues: Over half of this group reported that they do not know how to participate, and almost half said that they do not feel welcome.

Detailed results:

- o I never heard of IETF: 82% strongly disagree, 14% disagree, 1% agree, 3% strongly agree In short - 4% report not having heard of the IETF before the survey
- o I don't know what IETF does: 57% strongly disagree, 35% disagree, 8% agree, 0% strongly agree In short - 8% don't participate because they don't know what the IETF does
- o I don't know how to participate: 21% strongly disagree, 21% disagree, 44% agree, 14% strongly agree In short - 58% of those who do not participate in the IETF do not know how
- o I don't believe IETF documents are relevant to my job: 53% strongly disagree, 33% disagree, 11% agree, 3% strongly agree In short - 86% believe that IETF documents are relevant to their work
- o I don't feel my operator input is welcomed: 14% strongly disagree, 42% disagree, 33% agree, 11% strongly agree In short - 44% do not participate because they feel unwelcome
- o I rely on my vendors to represent me: 27% strongly disagree, 37% disagree, 30% agree, 6% strongly agree In short - 36% rely on their vendors to represent them at the IETF
- o I don't need to participate, I just need the output: 24% strongly disagree, 49% disagree, 23% agree, 4% strongly agree In short - 27% choose not to participate because they are only concerned with the output of the IETF (RFCs)

### **2.2.2. Do not currently participate on IETF mailing lists**

Among respondents who do not currently participate in IETF mailing lists, over two thirds believe that it does, in fact, fall within their job to do so. While most respondents had at least heard of IETF mailing lists, about half reported not knowing what happens on those lists and 40% said they don't know how to join. Also, about a third of respondents do not participate on IETF mailing lists because "list noise" (off-topic and unhelpful content) is too high.

Almost three quarters report staying off the lists because they don't think they have enough time. Almost half of those who are not on an IETF mailing list thought they had to show up to meetings to



participate and were unaware that most IETF work actually takes place on the mailing lists.

Detailed results:

- o I've never heard of IETF mailing lists: 44% strongly disagree, 25% disagree, 25% agree, 6% strongly In short - 31% had never heard of IETF mailing lists before this survey
- o I don't know what happens on IETF mailing lists: 23% strongly disagree, 23% disagree, 44% agree, 10% strongly agree, In short - 54% don't know what happens on an IETF mailing list
- o I don't know how to join an IETF mailing list: 35% strongly disagree, 25% disagree, 34% agree, 6% strongly agree In short - 40% aren't on an IETF mailing list because they don't know how to join
- o I'm not interested: 29% strongly disagree, 55% disagree, 14% agree, 2% strongly agree In short - 16% of respondents don't participate due to lack of interest
- o I find the content too technical or abstract: 27% strongly disagree, 47% disagree, 25% agree, 1% strongly agree In short - 26% find IETF mailing list content too technical or too abstract
- o I don't have enough time: 8% strongly disagree, 20% disagree, 41% agree, 31% strongly agree In short - 72% say they don't participate because they don't have time
- o I don't find the content relevant: 25% strongly disagree, 58% disagree, 16% agree, 1% strongly agree In short - 83% find IETF mailing list content relevant
- o It's not my job: 22% strongly disagree, 48% disagree, 25% agree, 5% strongly agree In short - 70% think that following IETF mailing lists falls within their job duties, even though they don't currently do it
- o There's too much noise on the lists (off-topic discussions, etc...): 15% strongly disagree, 51% disagree, 27% agree, 7% strongly agree In short - 34% replied that "list noise" is an issue for them

Before taking this survey:



- o 54% I was aware that most of the work in the IETF happens on mailing lists between meetings
- o 46% I thought I had to show up at IETF meetings to participate

### **2.2.3. Do not currently participate in IETF meetings**

While most respondents had at least heard of IETF meetings, nearly half of those who do not currently attend IETF meetings reported not knowing what happens at a meeting and slightly more said they don't know how to participate. Two thirds of respondents told us they don't attend IETF meetings because they don't have the time and over three quarters because they don't have the travel budget to attend a meeting. Just less than one third feel it's not their job to participate at IETF meetings. Almost exactly half of the respondents who do not attend IETF meetings were unaware that remote participation is available.

Detailed results:

- o I've never heard of IETF meetings: 60% strongly disagree, 25% disagree, 10% agree, 5% strongly agree In short - 15% don't come to IETF meetings because they hadn't heard of them before
- o I don't know what happens at IETF meetings: 31% strongly disagree, 24% disagree, 35% agree, 10% strongly agree In short - 45% don't show up because they don't understand what goes on at an IETF meeting
- o I don't know how to participate in an IETF meeting: 30% strongly disagree, 21% disagree, 35% agree, 14% strongly agree In short - 49% don't participate in meetings because they don't know how to
- o I'm not interested: 39% strongly disagree, 48% disagree, 10% agree, 3% strongly agree In short - 13% avoid IETF meetings due to a lack of interest
- o I find the content too technical or abstract: 33% strongly disagree, 48% disagree, 17% agree, 2% strongly agree In short - 19% don't participate in IETF meetings because the content is too technical or too abstract
- o I don't have enough time: 15% strongly disagree, 21% disagree, 36% agree, 28% strongly agree In short - 64% don't come because they don't have enough time to participate
- o I don't have the travel budget: 7% strongly disagree, 11% disagree, 37% agree, 45% strongly agree In short - 82% don't



attend IETF meetings because they lack the travel budget

- o I don't find the content relevant: 30% strongly disagree, 56% disagree, 10% agree, 4% strongly agree In short - 14% don't come to meetings because they content is not relevant to them
- o It's not my job: 26% strongly disagree, 44% disagree, 23% agree, 7% strongly agree In short - 30% don't attend IETF meetings because it doesn't fit their job duties

Before taking this survey:

- o 50% I was aware that most of the IETF meeting sessions are available to remote participants
- o 50% I thought I had to show up at IETF meetings to participate

### **3. Potential Challenges**

In addition to the multiple choice options on the Operators and the IETF survey, we included several opportunities for respondents to enter freeform text. We asked questions such as "Tell us about why you do not currently participate in the IETF in your own words" and "Why do you think other operators do not participate in the IETF?" When these responses are evaluated in combination with the numbers above, some themes emerge.

There appear to be four major perceived obstacles to IETF participation:

- o Time
- o Culture
- o Money
- o Awareness

These one-word captions are, of course, simplifications. The following sections dig into each of these themes to explore the potential and perceived challenges a bit more.

#### **3.1. Time**

One of the top complaints from both survey respondents and operators we have spoken with in person is how much time is required to participate meaningfully in the IETF. As Mr. Bush pointed out in his





2005 paper:

"The IETF has grown so large and so enamored of complexity and featuritis that it is a full-time job to participate."

We can see this perception confirmed in the numbers above:

- o 72% of respondents who do not participate in IETF mailing lists say they don't participate because they don't have enough time
- o 64% of respondents who don't attend IETF meetings report that they don't come because they don't have enough time to participate

Additionally, the most common response to both "Tell us about why you do not currently participate in the IETF in your own words" and "Tell us about why you are not currently a member of any IETF mailing lists in your own words" were some variation of "not enough time." This was the second most common response to the "Tell us about why you do not currently attend IETF meetings in your own words" question as well. While many of those responses were very terse, some took the time to explain their challenges a bit more:

"Time restriction is an issue. Keeping up with my "day job" responsibilities is challenging. There's difficulty in sorting out where the different BoFs and working groups are in the process - very hard to step into the middle of an ongoing conversation, translate it to my world, and engage in the discussion. Makes it hard to do more than lurk."

When we dig into the details of some of these comments, it appears that time constraints may be tied in some ways to what we're calling cultural challenges here.

"I don't have the time to sift through the entrenched autistic and esoteric arguments. There are very obviously people who are paid to participate in the IETF by vendors (and other orgs) for whom it's their full time job, or one of the primary purposes of their job, and they don't have other significant responsibilities. It therefore makes debating with these people very difficult if your involvement in IETF is a secondary (or tertiary) function of your role."

### **3.2. Culture**

Another common challenge we heard about while conducting this survey is one of culture. While the IETF is open to participation by anyone, some feel that they are not welcome or that they will be ignored or treated badly by other participants.



We saw above that almost half (44%) of the respondents who do not currently participate in the IETF at all avoid it because they don't feel their operator input is welcomed.

This is echoed in some detail in many of the comments left by respondents:

- o IETF are just concern about the old members and don't think of how to get new members onboard
- o "I do not feel that the IETF is responsive to the needs and requirements of those delivering services. The responses to the IPv6 DHCP enterprise requirements are an example of the disconnection in the IETF. Many times I have read or participated in discussions on different mailing lists about many of the topics and the final item pushed out by people in the IETF has been "you're stupid and an idiot and we're going to do it my way". I can get that at home with my teenager."
- o "Conversations are heavily dominated by academics with little or no practical experience (but deep theoretical knowledge and skills), and vendor professionals who are so senior and experienced. Both folks cast long shadows that are intimidating to others who can't devote the time to keeping up with what are often detailed and nuanced discussions."
- o "Despite wanting claims that operators were welcome, as I switched from protocol engineer to operator, I saw growing irrelevance. The IETF is maintaining an "ivory tower" vision of how the Internet is used, whereas the world economy has a different view of how to make use of the medium. The IETF hasn't been welcome to new sets of requirements. In DNS, the IETF has been effectively replaced by DNS-OARC."
- o "[I don't participate in the IETF] Because its become a political fight between vendors. Vendors push their individual agendas without caring about user opinions. A contentious issue will bring out half the opposition companies employees to bash and kill it regardless of whether there is a true customer that may benefit from it."
- o "I perceive it to be full of pompous, self-serving, out-of-touch with reality, technology actors."
- o "The IETF is not really focused towards operations and, historically, operator input has not been well received."

Another aspect of culture is being more open to participation from



around the world:

"Most studies have been conducted in English, which makes it difficult for those who have not mastered the language."

### **3.3. Money**

The most common free-form response to "Tell us about why you do not currently attend IETF meetings in your own words" as well as the fourth most common response to "Tell us about why you do not currently participate in the IETF in your own words" was money, and general support from the respondents' organization. Some of the nuances here are pointed out in the responses:

- o "It is too expensive to attend regularly. It is not my primary job to attend IETF meetings, so is secondary to other things."
- o "I don't have enough budget to attend the conference. Based up in India, my travel budget + accommodation + Food + Visa will come around 2000 USD (for Conferences in US) at the minimum, this is my 2 months salary."
- o "I'm a self-employed contractor. I can't afford to pay for it myself, and my clients wouldn't pay to send me there because it's not what gets their business needs met. And every hour I spend at conferences and the like is an hour I don't get paid."

Additionally, a full 82% of respondents who don't attend IETF meetings reported that it was because they lack the needed travel budget.

### **3.4. Awareness**

Throughout the survey, respondents told us that their ignorance of the IETF, what it does, how it operates, and how individuals can get involved, is a barrier to their participation. Overall, 58% of those who do not participate in the IETF at all reported that they do not know how to.

Among respondents who don't follow any IETF mailing lists, almost a third had never heard of the mailing lists, over half said they don't know what happens on IETF mailing lists, and 40% reported not knowing how to join a list.

Likewise, among those who do not attend IETF meetings, 45% told us they don't show up because they don't understand what goes on at an IETF meeting and nearly half (49%) said they don't participate in meetings because they don't know how to.



As with the other themes, this was echoed in the comments:

- o "No awareness of how I can help, what I can do, and where my goals would align with the IETF."
- o "I do not know how can I participate in IETF. I would love to know how can I participate. not just by subscribing to mailing list but by doing some work in my part time."
- o "I have no idea how to even begin participating"

### **3.5. Other**

There are also other reasons that came up in the freeform answers that we feel are very important but that don't fit into one of the themes above. They include:

- o Too technical: "Too broad", "Discussions are on an abstract, technical level above my expertise"
- o Not operational enough: "Not enough operational lists", "Operations guys stay home doing operations"
- o Ignorance: "I never felt the need, it never occurred to me to try"
- o Management support: "Lack of Management Support"
- o Out of scope: "Out of scope of my job", "I really don't care", "Not relevant to my job"
- o Format: "The meetings are all about status of a particular draft which really isn't that interesting."
- o Reliance on vendors: "Operators mainly rely on system integrators and rarely believe that their voices are heard"
- o Not relevant to operators: "Not relevant to the short/mid-term needs of most operators", "The lead time from idea to RFC to vendor support to using in a design is years for me. I will tend to use a technology once it reaches maturity."

## **4. Possible solutions**

The ultimate purpose of collecting this information and identifying the perceived challenges to operator participation in the IETF is, of course, to help us find ways to bring more operational input into the IETF. In other words, we want to determine how we may be able to





solve these potential challenges.

The possible solutions listed here are based on the survey results and on numerous conversations with operators around the world. This is not expected to be an exhaustive list but rather a starting point for further exploration. Note that this paper is simply documenting potential solutions and is not, at this time, making any recommendations. The next step of this process is to widen the discussion and explore all of our options for making the IETF even better than it is today.

The remainder of this section is dedicated to individual ideas; some are suggestions for change at the IETF, others point to activities that operators or operator groups could do to help, and some are clues to what the Internet Society may be able to do. These ideas for possible solutions are grouped into three larger buckets or themes. The themes that the solutions fall into are:

- o Communication
- o Outreach
- o Inclusion

At this time, this is a very raw collection of direct quotes from the Operators and the IETF survey, and others we spoke with anonymously. In later versions of this Internet-Draft we intend to update this section based on conversations both inside and outside of the IETF.

#### **4.1. Communication**

The first theme that we saw emerge among possible solutions is one of communication. Most of these ideas focus on alternative methods of communication between the IETF and its constituents and specifically on new ways to provide condensed information to IETF participants and potential participants.

##### **4.1.1. Mailing List Digests**

- o "Quarterly summaries for those that are not able to attend."
- o "Provide a curation service that takes key developments in a working group and shares them from time to time - save operators from having to make sense out of nuanced arguments so that they can jump into conversations with reasonable confidence they know what's happened so far and therefore won't embarrass themselves."



- o "There's probably no silver bullet, but one thing that I would find most useful would be a single daily/weekly/monthly digest mailing list. Just headlines and updates from each of the working groups. (Along with links to where to find more information for each.)"
- o "Make it dead simple for folks to see the specific topics being discussed and worked on. If I had some idea what the topics were, I would be more likely to participate if there was a topic that I had some expertise in and more importantly an opinion about how to address the issue."
- o "a blog with some updates of things would be nice. reading a huge amount of emails is not that fast and with a blog post you can join the discussion when there is something important ongoing"
- o "At least provide weekly summaries what's currently in discussion and which new drafts or RFCs were published."
- o "Invest in reducing perceived entropy and lower the time commitment to do so - both requires energy inputs. Action: Introduce and invest support staff that write accessible summaries (like the former Cisco IPJ) - licensed under CC so that they can be freely translated to other languages without breaking the bank: Note - I'm associated with IPJ and am biased."
- o "Highlight specifically which groups' efforts are looking for operator input. Or color-code agendas by "how close" different efforts are to needing operator input. Have those folks write an operator's abstract. Package the background homework to make it easy for us to catch up and easy to see if the effort is relevant to us. Give ways for us to input to the process that is separated from the "players" usual modes (eg mailing list)."

#### **4.1.1.2. Alternative Communication Mediums**

- o "Offer communications options other than e-mail."
- o "Surveys like this are a good start. Ask about the vendors we have relationships with, what technologies we currently use, what we're deploying now, and what we'd like to deploy in future."
- o "Audio-only podcasts are a really great medium for busy people, IMO. They convey the personality of the people who are presenting them whilst still allowing us to do things like drive to work, cook, vacuum, or jog."



- o "RSS feeds that help busy people keep track of the really important happenings would be good (maybe they exist already)."
- o "Could RFCs be made more friendly in the following fronts: \*  
Readability: have an "human" English version and/or summary. \*  
Viewability: it seems the format followed is from the 80s. Make changes to the font, format, etc. to make reading them more appealing."
- o "Make it easier and less time consuming, like having a simple system for feedback on drafts and decisions."
- o "Determine the questions to ask of Operators, and then start distributing those questions/forms via social media and reddit."
- o "Transition from ASCII Text RFCs to documents that support figures. There was a time when text-only made sense, but that was long ago. Figures made out of ASCII characters are difficult to read and are not able to convey as much information."
- o "Create polls for various important matters where operators vote. Give the chance to operators to propose their ideas in simple texts and then have an IETF expert help them translate this simple text into an IETF doc. Ask the operators for various issues regarding the current RFCs and get their proposals about them."
- o "We need tools which makes IETF-related work more effective. For example, my main problem is I can not see any way of easily track/find all discussions related to a particular drafts. Let's say I see that a very interesting draft has been published. Most likely there will be a lot of different email threads going on so it is really hard to track all discussions/comments."

#### **4.2. Outreach**

The next theme we heard is one of outreach to the operators, primarily through existing network operator groups and forums but also through more traditional marketing and publicity techniques:

- o "More liaisons between the IETF and Operator forums"
- o "Possibly smaller events like ARIN road show events for the general IT community"
- o "Participation in I.E.T.F needs to be demystified. Internet Society needs to reach out to the operators and the local technical community in every country to create awareness that I.E.T.F is open for participation, it does have a membership



system, and that anyone who participates can equally contribute to discussions on the same level as more qualified or frequent participants. And that funding opportunities are open. And that it is important for operators to take part."

- o "I'd recommend signing up to popular mailing lists like NANOG or CISCO and JUNIPER NSP and promote the ongoing IETF topics/agenda, current meetings to encourage operators to take part in what they find interesting"
- o "The IETF could do a better job of making themselves known to newbie networkers. Ask anyone who's been in the field for less than two years and you're unlikely to get anything more detailed than "Oh, uh, I think they write RFCs.""
- o "Give more information about IETF to local engineers in local languages with simple example of advantages of participation."
- o "Post in relevant worldwide networking mailing lists when you have information that wouldn't be spam like. For example, when you post meetings, are also at an event related to the mailing list, etc etc."
- o "co-located sessions in Network Operators meetings"
- o "Road shows at other well attended operator events (ie: NANOG, MAAWG, etc)."
- o "Promote IETF events and involvement through regional tech events & meetups (in the Seattle area: NorthWest Tech Alliance / SeattleTechForum) and industry related trade-shows and events (NANOG / ARIN / PTC / SuperComputing / etc.). As well, providing a brief summary of how to support / become involved with the IETF which is promoted within the IETF pages and/or search results."
- o "Try outreach programs to EDU operators. EDUs are the testbeds of the past, present, and future. Engage us!"
- o "1. IETF members presence on different conferences. 2. IETF must publish examples of stories or good practices in e-zines or participate at national events. 3. IETF must invest in promotion and presence in various technical media, university curriculums, national events."
- o "Collocating (interim) IETF Meetings with RIPE/NANOG/etc meeting - I attended an interim IETF meeting after a RIPE meeting - at least for the ops groups."





- o "Promote the IETF impact and role of standards to large operators (education)."
- o "Also setting up a IETF operators conference that is design to bring the long term to the short term relevance and present it ways that is significant to operators and not just RFCs that vendors and operators have to figure how to make into products. This should include the vendors that are creating products based on new standards to present what they are doing with it. Would provide real world ties to the work IETF is doing rather than RFCs that get lost in code and are generally ignored by future companies. You would be surprised how many new product vendors do not have a clue about some of the older RFCs that are still HUGEY significant when developing a device. Things like new vendor mini conference that goes over operationally significant RFCs that they should be building into their devices."
- o "As for the Internet Society, probably modifying the mentorship programs to be announced more on local mailing lists and also require winners to spend some time on mailing lists before attending events."
- o "We are here in ISOC India Chennai Setting up a Remote Engagement Hub (India) we will be requesting all Stake holders which includes ISP/Telcos." (Also see LAC-IETF)
- o "initially be possible to create regional forums that are preparatory style operators to approach, understand the benefits and challenges for both regional and continental as implementations of the ietf can create a kind of good practice for operators as Lationamerica less scale and the Caribbean."
- o "Provide briefings to operator community on technologies that may be relevant, and how to get up-to-speed on them. Actively seek operator feedback on those technologies (this has been tried in the past, but on a very one-off ad-hoc basis)."
- o "Increase interaction and outreach between IETF and operator forums, probably by identifying a subset of IETF drafts and areas that could most benefit from additional operator input such that we can focus the help that we're asking for - simply trying to convince people to participate generically isn't likely to be successful, while asking for specific feedback on specific items will be seen as a better use of time. It may even be useful to try to coordinate one meeting per year or every two years with an operator forum to encourage cross-pollination."



- o "It's a tough question... You need a "hot RFC" and turn it into a media-backed frenzy. Something focus interest of a large number of technical folks. You may also want to just elevate a few select 'products'. Keep a few key items "up front". For instance, take a look at Mozilla and Mozilla Labs. Even Google and (now defunct) Google Labs. Push a few key "products" (of the IETF's 7136 RFC's) and put them everywhere, showcase a few more. Focus and push the technologies forward and you may get more participation."
- o "ensure that meaningful RFC's and other publications get more press than TCP over Avian Carrier."
- o "Strategic Plan of publicity about IETF and its main activities. This strategic plan should be in several languages to reach everyone."
- o "I would love to see a list of reasons why operator participation is needed and what the pay-off is for the operator, as well as the community as a whole."

#### **4.3. Inclusion**

The final theme we found amongst the offered possible solutions is one of inclusion. How can the IETF be more welcoming, in order to bring participants in and keep them engaged? Survey respondents had several ideas:

- o "Welcoming our participation would be helpful."
- o "make the operators feel more welcome"
- o "Education."
- o "Travel subsidy?"
- o "Make remote participation easier."
- o "Asking vendors to bring operators to the meetings. Planning a few IETF meetings right before or after a big operator meeting (e.g. RIPE, NANOG)"
- o "Encourage non-technical participation, cultural/educational program, beginner training."
- o "Introduce works in multi language."



- o "Well you see... [respondent wrote in Chinese characters here, which we can not include in Internet-Draft formatting]"
- o "Probably topical meetings (only for some area of IETF work) might lessen the burden on the main meetings."
- o "Provide some training opportunity during meetings to help justify participation."
- o "Provide scholarship and/or sponsorship to students, small operators."
- o "Provide more sponsorships"
- o "Facilitate joining committees."
- o "better discovery of projects. this may seem strange but perhaps a match making site to better express interests and goals if individuals and projects." (constituencies)
- o "Smaller focused sessions"
- o "It's hard for people in an operations-led post to make a justification for a portion of their time and budget to be invested in participating in the IETF. There's also the challenge that as an operations person does manage to spend some more time involved in the IETF and the standards process they end up doing less operations and more standardisation work, and therefore their input becomes less operationally relevant. There needs to be a greater acceptance among the IETF attendees of the fact that operationally focused people will dip in and out of the IETF as their work requires."
- o "Add more operational content."
- o "Require standards to get the buy-in of a variety of operators."
- o "if operator input was required in a "peer-review" fashion -- and operators were represented from very large to very small"
- o "Create a Service Provider input channel that is taken seriously. The SPAC (Service Provider Action Committee) is an example that exists within the Broadband Forum."
- o "Having dedicated listeners might help. As in: someone who actually listens to what operators say, tries to understand whether "reality" looks different than the perfect theoretical network design, and ensures that this is not drowned in other



discussions."

- o "New ways of gathering people reducing the cost (remote participations from multiple locations?)."
- o "48 hour days :-) Back-to-back WG meetings with other relevant conferences (ICANN or RIPE for DNS related topics would be the obvious choices) to reduce travel time/budget."
- o "Publish agendas early, lower the price of meetings and hotel accommodations, have more operator relevant side meetings, gather relevant working group meetings on the same day. Some interesting side meetings would be, Internet Exchange meetings like Euro-IX, joint NOG meetings, Peering forums, capacity update meetings, etc."
- o "Perhaps consider consolidating time by interest areas so that the travel time demands were not as great."
- o "I guess, having a BCOP (best current operational practices; like <http://bcop.nanog.org/> and <http://www.ipbcop.org/>) would attract more operators." "Acknowledge operators. Provide them ways to make a difference. For example, define a class of documents that require the participation of at least two operators. That can be against the usual convention of "individual" participation, but anyway we know that it no longer holds..."
- o "Suggest that the IETF working groups, especially the ones dealing with topics that operators would have a significant interest in, start to accept that operator requests may be valid even if they are not in agreement with existing opinions."
- o "I would restructure IETF to be more agile and remove the political hierarchy of IETF that prevents wider participation. The use of operators as working group Operator Councils rather than just having Co-Chairs to determine what topics are good and not good for that working group. ... The #1 thing is to remove the politics of IETF so people with ideas and good suggestions are not stifled by the IETF machine and the fulltime IETF politicians."
- o "While I know it can't be (and shouldn't be done), reduce the voice of the people who seem to have nothing else to do than reply to emails whole day. IETF should be about different views not destroying everyone who don't agree with you."
- o "Do some IETF meetings in our region, especially where there is dense penetration of internet users as well as a strong technical





community (such as Southern and Eastern Africa)."

- o "Try and group more operationally-relevant sessions together so that it doesn't require a full week to participate."
- o "It needs more open leadership. The top of the IETF is like merry go round. The same folks make sure their colleagues all get jobs, same names, same people, no change"
- o "Operators don't care how the things are fixed, we do care if the requirements are addressed. Create a WG for operators to establish business needs, and customer needs - let them create "requirement's documents" in the form of conceptual abstraction meta models that can be put out in the body. Treat this as an Open Framework a bit more, and lower the tribal culture a bit less."
- o "One day ticket is good idea. And place is important for us."
- o "Better stewardship/shepherding of drafts and stopping the brain damaged drafts from wasting WG time. Not everything requires IETF work, nor needs to be written in a standard."
- o "Internet society should do more educations in operators management level. I notice that my company seems fonder on ATIS and Cablelabs. I guess because the white papers published that usually not require most technical people to understand. Thus, management level can know what actually go on in industrial. On the other hand, RFC is very technical. Management doesn't know how that applies to them. So, some user-friendly introduction of WG and how they can help operators may be good to present to managements."

## **5. Conclusions**

This section will be completed after WG discussion.

## **6. IANA Considerations**

This document makes no request of IANA.

Note to RFC Editor: this section may be removed on publication as an RFC.



## **7. Acknowledgments**

Because the survey and many of our conversations were conducted anonymously, we have left this section blank at this time. We have however received lots of help from many members of the IETF and operator communities. If you feel that you made a significant contribution and would like your name to appear here, please let us know and send us cookies :)

## **8. References**

### **8.1. Normative References**

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.

### **8.2. Informative References**

[RFC3935] Alvestrand, H., "A Mission Statement for the IETF", [BCP 95](#), [RFC 3935](#), October 2004.

#### Authors' Addresses

Chris Grundemann  
Internet Society  
150 West 9th Ave.  
Denver, Colorado 80204  
US

Phone: +1 303 351 1539  
Email: [grundemann@isoc.org](mailto:grundemann@isoc.org)

Jan Zorz  
Internet Society  
Frankovo naselje 165  
Skofja Loka 4220  
Slovenia

Phone: +38659042000  
Email: [zorz@isoc.org](mailto:zorz@isoc.org)

