ICANN69 | Virtual Annual General – Remediating Universal Acceptance Issues
Tuesday, October 20, 2020 – 14:30 to 16:00 CEST

SARMAD HUSSAIN: Thank you all for joining the session on remediating universal acceptance issues during ICANN 69 annual general meeting on 20th of October 2020.

Very briefly, as far as the session is concerned, we're going to go through and it's basically an interactive session. We'll start with Dr. Ajay Data who's the chair of UASG to welcome all of you, and then we will have chairs of the technology working group, EAI working group and [inaudible] working group from UASG who will take us through an introduction to universal acceptance and the gap analysis done on technical issues so far, and into a discussion on how to resolve these technical issues. Without further delay, let me invite Dr. Ajay Data for his welcome remarks.

AJAY DATA: Thank you, Sarmad. Thank you, everyone—good morning, good afternoon, good evening—for joining another very important topic, as we all know, universal acceptance. This is nothing but a group of community members accumulated together to solve a global issue, and completely driven by community with all of you, with the people who [inaudible] selected to [inaudible] and admin group worked together to solve a global problem where we are promoting that all domain names and all e-mail addresses and all software applications are there equally.

And it's very simple, but since 2015, we have [inaudible] lots of success and a lot work is pending. And my friend s, Dennis and Mark are going to take you through a lot of what has happened in the session, and then next session, we'll complete a lot more work.

The mission also of UA is very simple: to mobilize the software application developers, to get their products UA ready by providing them encouragement, documentation, case studies. We work with them, find the gaps in the tools, find the remediations, measure the results and take it to the right user experience and to the end user. Obviously, the end user is the key where we can break the language barrier and bring them online, and they do not find any difference between an IDN and an EAI and ASCII and non-ASCII domain names and e-mail addresses.

And of course, the impact is huge. We are expecting a lot more new users are likely to be in native languages and regional languages, and this is a very important issue if we all are aspiring to bring next billion people online and make them as usable Internet as it is for all of us. So it's a huge thing. obviously, the choice and competition also comes along the way. And with this, I'm going to invite the vice chair of UASG, Dennis, to take us through and take the session further. Thank you very much. Over to you, Dennis, please.

DENNIS TAN TANAKA: Thank you, Ajay. Welcome, everyone. Good morning, good afternoon, good evening, everyone. This is Dennis Tan Tanaka, vice chair of the UASG and also leading the measurement efforts for the UASG.

So let me take you through some of the basics of universal acceptance and the Universal Acceptance Steering Group for those newcomers to this topic. Next slide, please.

The basic question, what is universal acceptance? To understand universal acceptance, we need to go back in time and take a trip to memory lane in order to understand the very basic issues of this. So we start from the beginning, as my grandma would say.

In the beginning of DNS, a few generic top-level domains were made available, generic strings, .com, .net, .org. [They have in common,] and also country code top-level domains, all using the ASCII encoding system and no more than three characters in length. That stayed that way for many years and software was developed in that DNS reality. So [since] top-level domains or domain names in general were using the ASCII encoding—ASCII is the American Standard for Code Information Exchange—and also no more than three characters, so it was developed that way with those constraints, if you will. Those were hardwired into software developers and stayed that way for many years.

So now you fast forward to 2001 where a new inflow of generic top-level domain names such as .info, .biz, .museum, .travel were introduced into the DNS, into the root zone, and that's when universal acceptance issues surfaced for the very first time. Then you add internationalized domain names into the mix when you're using a different encoding system and allowing a wider set of Unicode characters into using domain names, and universal acceptance issues

again exist because software was not expecting other encoding system, other character beyond ASCII in order to be used as domain names. So validation procedures, processes, storage, anything in the technology stack was made for ASCII only such consideration.

Why is this important? Universal acceptance is a cornerstone to a [inaudible] inclusive Internet by ensuring that all domain names, all e-mail addresses, in short, all online identifiers are accepted equally and treated properly in the software ecosystem. And also, achieving UA readiness ensures that every person has ability to navigate and communicate in their own language or script of their choice. Next slide, please.

So what does UA mean to you? Depends on who you are. Right now, we're speaking to software developers, policymakers, government officials, big companies, small companies, and UA can mean anything from if you're a software developer, you gain more skills so you're more marketable in the marketplace, you have your own set of skills so you can help small companies, big companies become UA aware. That means that you are aware of your software can successfully and properly process any type of identifiers in the Internet.

And that brings different benefits. From a governance standpoint, you're able to communicate effectively with your citizens in their own script and language. If you're a company, that means more customers that can find your business or your online business and do business with you, so it's a big economic opportunity. Next slide, please.

And so the Universal Acceptance Steering Group came to be in 2015 as a group of volunteers wanting to address this issue, advocating for the technical solutions that this variety of gaps exists in the software development marketplace.

And we do this by raising awareness with relevant stakeholders, so does go from software developers, decision makers, government policymakers. We provide, we create, write papers and provide training, educational materials in order to educate our stakeholders about these issues and how they could mitigate or fix them.

And also, we encourage businesses to become UA ready. That means they look through their technology portfolio, meaning a website or email systems and what have you so that they can reach out to their own providers and vendors in order to get them UA ready.

As part of our ongoing awareness issue, we also measure progress on UA readiness, and this year, we published the 2020 version of the UA readiness report. I'm going to ask staff to put that link on the chat room so that people can go through that on their own leisure time. Next slide, please.

So the UASG has organized itself into different working groups. We have a technology working group who is primarily focused on looking at the issues in the software development community and not only software developer as the actual coding community but also those are standard-making bodies such as W3C, IETF, [inaudible] working group and you name it, because the problem does not only exist in the code

itself but also in the documentation materials, reference information that software developers use in order to make code.

We have also the e-mail address internationalization working group which mainly focus on the e-mail ecosystem, and Mark will talk about it. Measurements working group, that's the group I lead. We are tasked with identifying the gaps in technology, so we do this by looking at different platforms and assessing readiness as to the acceptance, validation, processing routine that these platforms, applications do as far as online identifiers, domain names and e-mail analysis.

We also have our communications working group, and they help us with the outreach, communications within the social media channels, publishing our materials across different media outlets across the globe in order to raise awareness of the issues and create those conversation opportunities that we really need.

Then we have local initiatives working group, and these are different working groups across the globe. Right now, we have a China local initiative, an Eastern Europe local initiative, Thai, and I believe others are organizing themselves in order to work in their own regions, in their own sphere of influence in order to bring those conversations locally, because UASG can do so many things, but really, the conversation needs to be happening in country, in the marketplace. So our local initiatives are really valuable, and I think there's a session recording available now that you can hear our local initiatives talk about their efforts in the past year.

Last but not least, our UA ambassadors. These extraordinary individuals help us reach out to software developer communities, offering training, supporting hackathons in order to get those creative ideas flow in terms of how to adapt software or create more libraries and bridge the gap in UA readiness across the young or all software developers of all ages. So these are the groups that we organize ourselves in order to achieve our mission. Next slide, please.

So this working session is talking about remediation. The way we as a whole approach the remediation cycle is that first, we need to measure. In order to solve an issue, we need to measure what the issue is. So we go by identifying the technology platforms that we want to study and we assess a gap analysis, what are the issues there. For the most part, the measurement working group can do some of the work internally or we find outside help in order to complete those projects.

Once we get that information back to the UASG, then we need to engage with our technology and EAI groups in order to assess, okay, so we have these gaps in this technology, what do we do about that? So that's when remediation conversations—not really start talking. We start from the very beginning trying to prioritize what work needs to be done, but the real meaningful conversation about remediation is when we have information back as to what are the deficiencies, the gaps, and so that's when we need to start developing an approach as to how do we mitigate this. You can be involved from actually fixing code, if we're talking about open source repository, UASG can do some of that work by itself, or through outsource developers, or it's

going to be through advocacy if we're talking about proprietary software, right? We cannot touch, we cannot include code in that, so the only avenue we can use is through advocacy, reaching out, creating those conversations.

But also, some of the mitigation and fixing issues is about education, so creating materials, educating stakeholders, being involved in those developer forums where exchange of ideas happen as to, for example, [inaudible], right? Some software developer asks, "How do I do this?" Or, "This library does not work for this or that," so we can engage in that way as well. And so that's kind of the circle, and once we finish with one thing, we start with another and the circle goes on and on. Next slide, please.

So just as an example of how these work, currently, we are working on assessing the UA readiness gap in content management systems, and the way we went about it is we start with a small scope project in which we are looking at WordPress.org, so this is the open source CMS platform available in GitHub. We're going through the analysis right now. we're expecting to have a preliminary report by year end. So that will inform us our next steps as to we continue with WordPress and/or we expand the discovery phase as to, okay, so we know this much about WordPress but WordPress is not the only CMS platform used out there. There are Drupal, Joomla, from the open source platforms, but we also have those one-stop shops like Weebly, Wix, you name it, that also, whether—could be issues in there as well. So we want to know about those and see how we can mitigate those. So this is sort of a

flavor as to how we do that, the measurement part of it. Next slide, please.

I think you're all familiar with it, but when we talk about domain names and e-mail addresses, these are all the flavors that we talk about. The short top-level domain names, long top-level domains, internationalized domain names, and all the flavors of e-mail addresses from ASCII@ASCII to Unicode@Unicode. So all of these use cases or test subjects will be measured in our gap analysis efforts. So we look at whether they are accepted, validated, processed, stored and displayed properly in those instances. Next slide, please.

And again, I think I already touched on this. We look at different platform frameworks and libraries all through the technology stack in order to assess this. Of course, we do this in a very measured approach as to the availability of volunteers and time of the community and working group members, so we go one platform at a time but we try to do our best. Next slide, please.

And this is why it's a sneak peek of what you will find in UA readiness 2020 report. A few highlights, 11-10% of e-mail servers support e-mail address internationalization at this point. Interoperability is increasing. I think now we have the major webmail services such as Gmail, Microsoft Outlook.com and iOS 14 mail supporting, exchanging, sending and receiving e-mail internationalized e-mail addresses so that's good for interoperability, but yet there's still more than 90% of e-mail servers not able to do that.

As far as website readiness, 11% reported that they do not support Unicode e-mail addresses, and we still are short on short top-level domains. You would think that now ASCII—and this relates to ASCII top-level domains—you would think that 100% of these are accepted worldwide, but the truth is still there's a little margin of work that needs to be done there. Next slide, please.

And with that, I will hand it over to mark who will talk about our e-mail address internationalization work. Over to you, Mark.

MARK SVANCAREK: Thanks, Dennis. This section is about e-mail address internationalization remediation, and what you'll see is that we've been able to start doing some measurements and more measurement is happening on the way. And this gives us hints as to how we should remediate things. Next slide, please.

So here's an evaluation of e-mail addresses by the top 1000 websites globally. And you could see that there are some areas that have increased quite a bit and others that have increased less so. So at the bottom of the page, new gTLDs that are short are well accepted, so that's great. The longer ones, almost as good.

Things that are—ASCII at a Chinese second-level but an ASCII top level, that's not looking too bad either. What's interesting to me at least is that Chinese@ASCII.ASCII and Chinese@Chinese.Chinese are much less accepted. So you would think that—well, okay, so ASCII@Chinese.ASCII, that may not actually require a full EAI stack.

That may just be an IDN on the domain name part and then just regular old SMTP local part.

For the Chinese@Chinese.Chinese and Chinese@ASCII.ASCII, that still feels like a pretty big difference to me. That'll be worth digging into to see if the systems are technically able to use these e-mail addresses that are just filtering them out with the regex or something.

And then the trickiest, of course, is the arabic@arabic, because those are right to left, so in addition to it being EAI, there's also the additional complexity of right- to left parsing.

So there are, in some categories, moderate changes year-over-year. In others, the problems are still pretty stubborn but progress generally across the board. Next slide, please.

So this is the way we break down an e-mail system for evaluation. We have to look at all these different parts. In the beginning, we started looking at entire offerings. So vendors who supplied an entire stack is what we looked at, but we soon realized that a lot of implementations are you pick this piece from here and pick another piece from there, and so all the different parts needed to be tested in some sort of isolation.

If you want to know what all these pieces are in more detail, I've got a link here. Take a look at this EAI document, it's UASG 12, and this will tell you everything that you need to know about e-mail address internationalization. And it has an explanation of these parts. Next slide, please.

So here's some early testing. We're undergoing far more testing right now of many more components. And you could see that there are some features that are pretty well adopted by all the vendors, subject line can be in Unicode. That actually has nothing to do with EAI but is part of the EAI experience, so we list it as part of our test. Folders named in Unicode. Same thing. Not really EAI but an EAI user would expect them. Sending and receiving, that's what we call phase one. In this selection here, it's not consistent across for instance. I'm not going to read all of these cells, but you can see that for the mail user agent component, this is the way that the test results turned out for five offerings. Next slide, please.

And then for webmail services, a similar breakdown of features. This is a little bit better than on the last slide. So, what do you do with this? Well, there are a number of things that you need to do in order to remediate these problems. If the company has a bug reporting system or has someone like me who can be an intake system, then you can work directly with the supplies. If it's an open source thing, then you have to contact those developers, maybe even try to get your own fixes in if you have sufficient reputation. Also, you can go online to places like Stack Overflow and answer questions. That's another remediation technique that we're looking at.

There's no one simple solution that applies to all the components for all of the features. So it remains challenging, just like any other universal acceptance challenge. I want to put another document here. This is 21(b). if you'd like to know more about the testing

methodology, here's a document that we used to get these test results.

I see a question in the chat. "Has Microsoft Exchange Server started to support EAI?" Yes. Microsoft Exchange Server 2019 does support EAI, and it'll be tested in the next round of tests. I've already seen some preliminary results and passed them on to the engineering team. So hopefully that answers that question. Next slide, please.

And then finally, here's a measurement of e-mail servers. So if you look at how they announce themselves, there's a big clustering and you see that Outlook and Gmail consistently report and others not so much.

Another question. "Looks like there's some lack of security documentation regarding EAI and IDN usage on the UASG's website and scope of work. It could make a special section on the website designed for these security issues." Okay, that's an interesting question. I hadn't thought of that. Is there anyone who'd like to take that question.

DENNIS TAN TANAKA: Mark, what about the best practices or considerations for mailbox names? I think that goes into that.

MARK SVANCAREK: Oh, yeah, that's true. So we have another document that I wasn't going to talk about here today, which is a good practices document for

e-mail administrators who want to have their own EAI service. We've talked a lot about how do you know if a component is compliant, how do you work with a component supplier to make them complaint if they're not. This is decision makers, how do you become universal acceptance? How do you make sure that your vendors support universal acceptance?

But one piece that we had always left out was, all right, now you have decided to have an EAI e-mail service. What do you do? There's already lots of documentation about IDNs and variants and things like that, but there hadn't been a lot of literature—or maybe any—about how do you choose mailbox names, what are the considerations?

So if you have an ASCII e-mail service, you probably have all kinds of policies around e-mail names. Maybe they're all six characters long or they have dots in them or they're based on the user's name or other things like that. Maybe you offer aliases, maybe you don't, which would be multiple names that map to the same mailbox.

So we've created a new document which is good practices for choosing EAI mailbox names, which we think will help people in regard to those choices. So it lays out, here are all the things you need to consider, here's a checklist you could use to figure out what your solution should be.

And then the question is, "UASG.tech EAI ready?" No, it's not. We're working on that. There's a whole bunch of questions from Achara here in the chat, and they really go to ICANN's infrastructure, so perhaps

Sarmad could take those to give an indication of what the challenge is and when we might see some changes.

SARMAD HUSSAIN: Thank you, Mark. As far as the mailing list is concerned, currently, we're using Mailman for ICANN, and we are actually in touch with Mailman, we've raised that issue with the developers, that there is no EAI support, so that obviously matter has been raised, it's not been fixed, so we still are not supporting EAI until that happens. Thank you.

MARK SVANCAREK: Thanks, Sarmad. How much time do I have left?

SARMAD HUSSAIN: I think you can go on for a few more minutes if you'd like.

MARK SVANCAREK: Okay. There's another question in the chat. "Is there any EAI-ready mailing list software?" That's actually one of the things that we're going to be testing now, because we've realized that there's additional categories of e-mail components that we hadn't been looking at. So mailing list is one of them.

So, as you can see, there are a lot of challenges related to EAI and remediation of them really comes down to what they say, the chicken and egg problem. Getting more support is often dependent on showing market demand, and market demand doesn't necessarily

exist in the markets of the vendors or doesn't exist because end users just don't even know that this might be available.

So some of the other activities within the UASG of increasing awareness go towards increasing the demand. In other cases, we've had to work more closely with the vendors to get them to support it. So I'm expecting that Tencent will be offering EAI soon. We've got some communication from them. That was a result of an outreach to them two years ago. So there's no silver bullets and there's no easy answers, it's just us chipping away at this problem and eventually the critical mass builds up so that the progress is faster.

Are there any other questions related to that, anything else I could elaborate on? Okay, Maria is talking about security issues related to Unicode and EAI. It is true that things that apply to IDNs, those sort of confusable issues also apply to e-mail addresses. And what I'm seeing is sort of a standardization occurring if an e-mail software sees that an e-mail address contains multiple scripts for instance, it'll usually flag it and say this is a suspicious e-mail address, you might not want to answer this or read it or anything like that. In Microsoft solutions, that's called a tooltip, that's kind of a legacy name. It would be like a little yellow banner with text in it warning you we don't trust this e-mail address.

And more and more, heuristics are being applied to all our e-mail filtering, so that stuff just goes into your junk, or maybe you don't see it at all. But there are engineering resources and a lot of thinking being applied to how do we maintain the usefulness of EAI for the people

who want to use it and not confuse people who don't use it by preventing them from seeing things like mixed script attacks. Okay, I think that's it for me. If you have any other questions, just submit them to the chat.

SARMAD HUSSAIN: Thank you, Mark. We'll move on to the part on technology. Let me invite Satish Babu who's chair of technology working group to present this part. Thank you.

SATISH BABU: Thank you, Sarmad. So I'm Satish and I'm chairing the technology working group. Before I get into my slides, I think we should respond broadly to some of the questions that are raised. One set of questions relate to the UA readiness of our own sites, basically UASG as well as ICANN.

so, as has been pointed out, these are sites that are built with various tools, and once you have all the tools, when the tools are UA ready, then you can think of making a site completely UA ready. Now, that is perhaps sometime in the future, we are working towards ensuring that the main tools used become UA ready, but we're not quite there yet. We're also aware that there are proprietary solutions that are there for UA readiness in some cases, some vendors are providing a full range of services, but as of now, the general tools—if you look at—there's a question on the prioritization technique, how does one prioritize.

Should we look at the regional software, regionally popular, which means software that's popular in certain languages or regions?

So when we prioritize, we were thinking of the global impact factor as to what kind of remediation, because we have scarce resources. There is a limit to what we can achieve and how many tools we can target for UA readiness or remediation.

So we had started kind of working at the tip of the iceberg, as it were, and there is a whole way to go. So this is a slow process, as we're discovering. And what I'll be talking about over the next six to seven minutes is where we are at the level of software tools, libraries and so on. Next slide, please.

So, there was a study done in 2017 with the browsers, and the domain names, as you can see. The level of readiness is generally fine, but there are some visible exceptions. So the browser on the far right is actually not a browser that's used by—it's not among the top three or four browsers, and that [we see] is not a complaint at all, but we see that among the other browsers like Chrome, Firefox or Safari, and IE—IE seems to be the most complaint from a UA perspective.

But item ten, which is an Arabic label with .top TLD is that that has failed. It has failed in several cases. So we can see the complexity right there. Now, we have just recently registered several more domain names on the—you can see here that the number of scripts covered are not too many. Now, at this point, there are several more scripts [that are there] and we have just made a list of these scripts and the staff team is now in the process of registering these domains so we

can test them out. Currently, we don't even have any—there are so many test cases that can be possibly done, and we're trying to kind of limit that [combinatory] explosion to a manageable number. So this is about the browsers of desktop machines. Next slide, please.

This is about the readiness of browsers in mobile devices. So now I see in the chat that only Chinese and Arabic examples, not even Cyrillic. That has been addressed. So the list of scripts that we're going to test out now has already been finalized and we have taken one domain from each script, so that is being worked on right now.

There's a question, "Totally disagree with your opening comment, this completely fails the UA mission." Okay. All I can say is I would leave this to Sarmad to answer at the [FAQ end] of the session, but I think the point is that the UA mission is not going to be achieved overnight. It does take a finite amount of time. So from that point of view, we have to see the progress, and we can judge the progress, of course, but if you say that it has to be achieved overnight, that's going to be very hard, and this has been happening for quite some time now and we are seeing that the progress is there, but it is slow.

You can see the mobile browser situation, it's far worse, actually, because the same number ten, the Arabic with the ASCII top-level domain fails very badly, whereas in other, in the case of Chrome, Firefox, Safari, and Samsung browser, there is a kind of patchy response. If you're interested in more details of what these things are we going to refer to right now, we have two documents that I'll ask you to kind of take a look. This is UASG 016, universal acceptance of

popular web browsers, and UASG 018(a), universal acceptance compliance of some programming language libraries and frameworks . So, so far, the two slides that we just covered relate to browsers, and the next slides look at the language and libraries. Next slide, please.

So here we have a bunch of libraries, as you can see, in multiple languages like C, Csharp, go, Java. There are multiple libraries on each of them, and the status. You can see that there are more reds than greens, and the yellow basically is UA ready but there are some edge cases which will not work, which is very troublesome because then the [evaluating] becomes very complex.

So now ideally, how we would judge the work of the UASG would be to look at this picture over a period of time and see what happens to the reds. Are they becoming yellows or greens? That would be, I think, progress. Next slide, please. This is continues, more languages, JavaScript, Python and Rust. There are some more greens in this case, but still, the reds are quit visible. Next slide, please.

Here we have a bunch of command line tools which are popular tools used for operations host, big NS lookup. These three are very close in terms of functionality. They kind of give you a bunch of information regarding a domain name, including the servers and the IP addresses and so on.

So you can see that there are several greens, and perhaps Centos has the maximum number of greens. Centos is a flavor of Linux, of course. And at this point, the question was raised earlier as to how does one remedy this, the reds that you see. So for instance, if you take Ubuntu,

you can see that host command doesn't work, dig doesn't work, nslookup doesn't work, and telnet doesn't work. These are foundational kind of comment line tools, and if these do not work, then we pretty much cannot work with [inaudible] IDNs on these platforms using these tools.

Linux in general is an open source kind of platform, and we have to then see how we can work, how we can persuade the maintainers of these tools to ensure that they become UA ready. As far as the community discussion goes, one of the things that we've been grappling with in the tech working group is that we need community input on how best to reach out to these kind of groups.

We see that the tools and technologies and libraries we're talking about range from a small group of passionate developers developing an open source library and maintaining it, to much larger enterprises, to giant. Obviously, one strategy is not going to work with everybody and we need separate strategies and ways of working. As we mentioned, for instance, we can work with these communities, we can join these communities, we can contribute to those processes, and then we can ask for—but then you can see that it is not going to be immediate. There may be some situations where there could be immediate responses, but—okay, I see a comment from Mark which says turning red into the green is good because—the point that's being made is that some of these libraries may not be required because they will eventually vanish over a period of time, so we don't have to spend our time and effort in making these reds into greens.

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Now, that needs a filter to see what are the libraries that are likely to be longer duration and what are likely to kind of get displaced as more innovation is happening in that space. This is something that we have to look at. So this is the magnitude of the problem that we're facing now. Next slide, please.

I think that is the end of it. So I'll be happy to join the discussions, especially on the kind of strategy that we should adopt for remediation for specific cases. There's also the strategy for prioritizing. For example, we have so many reds, and these libraries have been shortlisted on our perceptions on how popular they are. But even these popular libraries are likely to be phased out, so therefore, there has to be community input on that process of prioritization as well.

So I'll stop here, and back to you, Sarmad.

SARMAD HUSSAIN: Thank you, Satish. I will hand it over to Dennis to run through the rest of the session. Thank you.

DENNIS TAN TANAKA: Thank you, Sarmad. We're going to start now the workshop session. That's code for interactive session. On the chat, I asked—so we thought about two topics to get the ball started today, but we may have, depending on time—I don't know, we're 9:20 now, we run until 10:00. Is that correct?

SARMAD HUSSAIN: Yeah.

DENNIS TAN TANAKA: So we have about 40 minutes and I think we had a Q&A session at the end. We may be able to shift a little bit. So depending on time, we might have time for another topic of your choosing. So if you can propose topics on the chat room, then we can start looking at those depending on how popular those choices are.

So let's start talking about remediation strategy, and I will call upon my fellow colleauges, Mark and Satish, because this is not new conversation. We've started this conversation a few months back in the tech working group and also EAI. And we say remediation or mitigation of UA readiness, but when we start looking at the different layers of what a solution might look like, we start looking at a very complex picture as to [inaudible].

I talk a little bit in my introduction part, because remediation can go from education, just to raise awareness, educate and point stakeholders to the right source of information that they need to be looking at, be it standards, be it software libraries, and the other layer would be actually fixing code. So let me do this: Sarmad, can I share my screen? Because I think it would be useful if we can take notes of what we're talking about as in we are not in a conference room so we don't have a whiteboard, but maybe I can share my screen and my

notes here as we talk about and help us guide the conversation in a more useful way.

So I think you are looking at my screen now. Keep me posted if we have comments or hands raised so that we can get a conversation. So we were talking about remediation strategy here, so I'm going to topic one, remediation strategy, and the layers that I talk about is one is information and the other one is actually software. And these are basically the two big groups that we find doing any gap analysis, either information is incorrect or outdated, or the software is using, again, outdated libraries or different standards.

So here, when we talk about information, we point to a standard, W3C for example. For example, W3C has an information about multilingual web addresses and if I'm not mistaken, last time I checked—which was very recently—points to the IDNA 2003 standard, and we all know now we are in different standard, so that creates some issues. So those are the places that we are trying to form a strategy how to do the work. Marc, go ahead.

MARC BLANCHET: Yes. Let me state that developers, or people, are lazy. The average developer, which would include 98% of the developers, are essentially doing the following. They need, for example, a connector to MySQL. They google it, find a library in GitLab, find a reference, add it to their code and then start using it. They don't know the details, they don't figure out limitations or anything. Maybe later, maybe not. They take the library because of some criteria. The most popular, the most easy

to use, whatever. So if you're talking about an e-mail library of some sort or domain library, the fact that they are supporting EAI or IDN is almost zero in their criteria.

So my point here is that we will only, as a community, increase the availability of use of IDNs and EAI if the popular—to be defined—libraries and languages are completely UA ready, because again, developers are lazy, they will just pick one and apart from very few, they would not be aware of anything about EAI or IDN and they don't care and they have to finish their software for their release for next Friday and IDN is ... They don't know what that is.

So I'm suggesting that since you're talking about remediation strategy, that the best way is to make those popular libraries and languages UA ready as much as we can in different ways. It could be contacting the main developers, maintainers and see if they're interested. There's multiple ways to do this. And I'm not saying this because I want the work, I'm just saying that it seems to me the background work that needs to be done, because whatever we take into efforts to actually spread the word of anything, if the libraries are not UA ready, then nothing will happen because they won't take any effort to actually make them UA ready. So that's my comment on the strategy.

DENNIS TAN TANAKA: Thank you, Marc, for your insights. I think they're valuable. So just to recap, software developers need to solve that problem, and often, they'll [avail themselves of] readily available reliable ways that are out

there such as in repositories as GitHub or Stack Overflow, or you name it, the coding platform of their choosing, so they just want to solve a problem, for example, validating e-mail address, they'll do a google search and they'll find a popular option, however "popular" is regarded in such platforms. And they just solve the problem, right? As you said, without minding whether, in terms of e-mail addresses, there are all the flavors of e-mail addresses, and if you invoke the incorrect library, then you will be basically discriminating against all the types of identifiers.

So the way you're suggesting is let's find those popular libraries that are out there, again, however they are regarded as popular in these platforms, and try to fix those, right? And when you say fixed, not necessarily someone trying to fix those libraries because there's a maintainer behind it and those software maintainers need to embrace the changes, could be through advocacy, just having a valuable conversation with them and convincing, influencing that they need to change, or potentially funding them in order to fix those. So, thank you for that. Any other complementing comment on that regard?

Okay, so we talk about—and thank you, Marc, for bringing those real practical real-life examples in the software developer. That will go along the way to do this. In regards to information, standards, I know that we recently in the—I can't remember Mark, Satish, [keep me honest] whether it was in the tech or EAI working group, or perhaps in both, a conversation around the e-mail validation standard or guidance, what working group established, and namely, basically, it stays within ASCII. And we're having conversation around, okay, how

do we change this? How do we stop the notion that [inaudible] working group is advertising, basically, to all web developers as to what the "correct" validation procedure for e-mail addresses would be.

So, how do we think about this? How can we go about this? I'll put you on the spot right now so I can rest my voice for a little bit. Mark, go ahead.

MARK SVANCAREK: Sure. So I have a favorite example of lazy developers and what are the challenges. So I'll put this in the chat. Developers who are like me, very unskilled and very lazy, usually go to the web and say, "How do I do this?" Or, "Why isn't this working?" If you're doing PowerShell or java scripting or whatever, and then you just look for somebody who has already asked this question and gotten an answer, and then you steal tehri code sample. Stack overflow is one of the great places to do this.

So what I've put in the chat here is a thread that started 12 years ago called, "How do I validate an e-mail address using a regular expression?" And there's dozens of answers in this e-mail, and honestly, only one of them is correct, which is, "Don't use a regex to validate an e-mail address and here's why." But along the way, there's all these people submitting their regexes and stuff like that.

It's occurred to us that if we were more active on these sites, we would be able to submit our own answers to these questions and clear up the story and point people to the good resources so that—this advice has

lived here for 12 years. People still go to it. The page I'm looking at right now says viewed 1.3 million times, active 18 days ago. So people are still getting this confusing information from sites like this. So one of the ways to help lazy developers is to have our own presence on these sites, asking good questions, getting them answered, or providing new answers to those questions. Thanks.

DENNIS TAN TANAKA: Thank you, Mark. I know there's a ongoing effort in doing this, to establish a presence in the DNS community or software development forums in order to set the record straight, if you will, as far as this type of information so that it's readily available.

MARK SVANCAREK: That's right. We're trying to scope the work to see if we can hire some people to do some of this, because this is not the kind of stuff that can easily be done as a part-time thing by our volunteer community. We're looking for someone to really take it on in a professional capacity.

DENNIS TAN TANAKA: Yeah. Satish, please.

SATISH BABU: A couple of [additions.] One is that I think Dennis mentioned funding some of these initiatives. I think there could be some of the fixes coming out of—we can maybe contract some of the things in cases where the group says we're not interested. If you can get it done,

please go ahead. Now, the point is to start communication with these groups.

On Mark's point about joining these communities, we do have UA ambassadors to work at the grass roots level, but we also need either these ambassadors or a different set of people who are presently part of some of these communities [inaudible] take up with some advocacy and support from us. Some means of talking with their own communities and ensuring that the community treats this as a priority. So that push has to come from us.

Now, again, this is not a broad strategy, it has to be on a very case-to-case specific way, but we do need a set of people who can be our ambassadors to these different communities. Thank you.

DENNIS TAN TANAKA: Thank you for that, Satish. I think I'm capturing the idea correctly. Keep me honest here. Use the UA ambassador as a training vehicle to expand and knowledge sharing in the lines of setting the record straight or providing the good libraries that we find along the way. Any other thoughts on remediation?

We can talk all day about remediation strategies and tactics, but in the interest of time, I would like to move on to the next topic which is government stakeholder approach, and I'm not sure whether we have other topic on the pipeline.

MOHAMED ELBASHIR:	Thank you, Dennis. We have reached out to governments and developers community and reaching out to standard bodies like W3C and [inaudible]. We can proceed and post those in a poll to see the preference of the audience, if you'd like. Thank you.
DENNIS TAN TANAKA:	Thank you, Mohamed. I don't think a poll is necessary, right? We already touch on standard-making bodies such as W3C working group and the tech and EAI working group are doing an effort in order to establish a presence within these circles. And as far as developers community, we already touch on that too. And that will leave us with the government, and that's actually the next topic, so we can spend 15 more minutes on that one, then open to Q&A if that's okay.
	Hearing none, let's talk about government approach. Government stakeholder approach. Marc, go ahead.
MARC BLANCHET:	[All throw in] my comment. At least in my country, this is at least related or restricted to my country, which is Canada, and may not be appropriate for others .But I know well the government CIO. We've been working together for a few projects. And those guys are aware and want to know the issues, and for my government, we have English and French as official languages, so they want to support French, which means accents in Latin characters.
	One way they could—and we tried to do this for example for IPv6 a few years ago—is that they could put that criteria or mandatory criteria in

their RFPs. And given that government has pretty big spending power, that could change the market. The problem here is that before they do the RFP, they actually go around to the target vendors to see that you support this feature because they don't want to have zero candidates for their procurement. So it ends up having, if none of them or most of them are not compliant, then they won't put this as mandatory, but nice to have. And in fact, it becomes irrelevant because none of them have the support of that feature.

So I have [doubt,] at least in my country, about real power of governments for really influencing the market for the things I just described.

DENNIS TAN TANAKA: Thank you, Marc. Edmon, please go ahead.

EDMON CHUNG: Just quickly in response to Marc, I guess this is similar to what ICANN did I think a few years ago as well. Even if nobody is ready yet, the procurement process can add something like give us your roadmap to it, and that starts the process at least, even if it's not immediately, at least with the wight of the government procurement, that message could go out and they would have to fill in a question that says, "What's your roadmap for IDN EAI?" I mean UA. So just a thought.

DENNIS TAN TANAKA: Thank you for that, Edmon. Yes, I remember ICANN's CIO IT team, Ashwin and—can't remember his colleague's name. Yeah, during their journey to go to UA readiness, going through the inventory, some software is made inhouse in which they can fix the gaps, but the other type of software which is not inhouse, they need to work their relationship with tehri vendors. In some cases, they were successful into getting them UA ready, in some cases, they're not, but they always look at for future procurement processes that they include such requirements in terms of internationalization support. So that goes along the lines of procurement requirements so that software companies are aware of the issues and they see a real demand behind those issues [inaudible]. Hadia, please go ahead.

HADIA ELMINIAWI: Thank you. It's just one thought. Now as governments are more and more moving towards digital and economic inclusion, maybe having universal acceptance within the nation's digital inclusion program or strategy would make sense and help it move forward.

DENNIS TAN TANAKA: Can you say one more time the term that you used? I think I was slow to pick that up. National strategy?

SATISH BABU: For digital inclusion.

HADIA ELMINIAWI: Digital inclusion strategies, or plans, whatever they are.

DENNIS TAN TANAKA: And this is not just for you, Hadia, but those are close to this type of activity. Where can this conversation happen? First global basis and then on a country specific basis? How do we start—at least from the UASG, we have ICANN as a platform which is global. I think we have the GAC that can serve as a vehicle to start those conversations, at least in the ICANN platform, but then what? Are we talking IGF? Are we talking UN? What are we talking about in terms of trying to delineate a roadmap as to what are the components of this action here? Edmon, please go ahead.

EDMON CHUNG: I guess in my experience—and I think it's a good idea to think about the digital inclusion stuff, and usually, earlier on, there would be education [sites.] So UNESCO might be an area that you want to look at. And nowadays, a lot of it is targeted towards the elderly, especially for more developed places. So I would look at those two.

And one additional thing on that, I think that's a great comment which sort of sparked an idea, in terms of the schools, I think through governments, a lot of the schools are great targets for deploying EAI stuff. My five-year-old kid is now sending in homework because of COVID through e-mail, and those systems definitely could easily be updated and use for their native language names in a useful environment. So I guess those are just some thoughts.

DENNIS TAN TANAKA: Thank you, Edmon. Yes, very real and I too am involved in this sending homework through e-mail. Satish.

SATISH BABU: Thanks. So I would also add to the list ITU and UNDP, but broadly speaking, if you can align universal acceptance to some of the SDGs, it would be far easier to convince the UN system. And even for IGF, it'll be useful to have some link so we can examine which of the 17 SDGs has some kind of a relation with universal acceptance. That is a useful kind of place to start with the UN system. Thank you.

DENNIS TAN TANAKA: Thank you, Satish. On that level, I think the [DC-DNS] did some work on linking the SDGs—that is the sustainable development goals—of the IGF. Or was it UN?

SATISH BABU: Un.

DENNIS TAN TANAKA: Thank you. But yeah, that's true. There are is relationship between the SDGs and what we're trying to do, universal acceptance. And also as well as what Edmon pointed out which we can talk about, accessibility of the web for—those are disabled in some way, shape or form, or need access through voice for example. Many, now, the technology is

voice activated and if domain names are largely spoken in different language, then technology will not understand. So it's important that domain names and even [inaudible] stay relevant for those users, [speakable] to those users. Hadia.

HADIA ELMINIAWI: I think you already spoke about what I was going to talk about, and it was about the UN sustainable development goals. And as governments are working on actually achieving those sustainable goals, having—and digital inclusion actually works towards that. Universal acceptance could also be addressed within that frame, like locally. But the thing is, how do we put it on the table locally to be looked at within the development of the sustainable goals, right?

DENNIS TAN TANAKA: And Hadia, let me press, how do we do that? How do we put that locally? I think we have a fairly good view as to how we put it in the global platform. How do we start those conversations locally, where would those places be? Is it the local IGF chapters? What are examples of those places?

HADIA ELMINIAWI: If we're talking particularly about the sustainable development goals, I don't think the IGF would be the venue for that. Maybe it could start initiating the idea, but in order to have someone or ownership in order to have someone own the idea and work towards it, I don't know, I think this needs further thinking.

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DENNIS TAN TANAKA: Thank you, Hadia. I've not been following the chat. Difficult to moderate and look at the chat. Are there any questions or comments related to this topic that we can address?

MOHAMED ELBASHIR: Dennis, yes, we have three questions in the chat. There was one about how you're going to consider regional, let's say, software, or software that are popular in specific regions. For example, browsers in specific region, and are you considering those in your research?

DENNIS TAN TANAKA: Yes. Thank you. That's something that we are starting to do and recognize the readiness reports that we go are going to be [inaudible] our local initiatives. So what we want to do, for example, we're starting to do that for the social network applications, so we reach out to our local initiatives and other venues in order to gather, compile a list of the relevant social networks in these countries. We know the Facebooks of the world, but we want to know whether there are other applications that are more relevant in certain regions so that the record that we create and that we end up with is relevant for our local initiatives to have this conversation, create these opportunities to have a useful conversation around UA readiness. So it's important that we have this input. And this is a [priority that] we're going to continue moving forward to include as much local information as possible.

ICANN|69
VIRTUAL ANNUAL GENERAL

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MOHAMED ELBASHIR: Thank you. Another question, from Maria, I think it's EAI specific. Can you consider a typical software stack or technology for example that is used by hosting providers? And it might be a requirement or at least there is interest to make sure it's EAI-ready, and then it could help the whole system to be EAI-ready.

DENNIS TAN TANAKA: Thanks. That's more a Mark question. I think we already moved from the workshop to Q&A, right?

MARK SVANCAREK: That's a great idea. That's all.

DENNIS TAN TANAKA: Okay.

MOHAMED ELBASHIR: Thank you. The last question we got from Joshua earlier, and it was about how the community could be involved in selecting languages for testing or getting involved in [your] work. So basically, I think it's a general question about how to get involved in UA working groups.

DENNIS TAN TANAKA: Sure. Let's post that link to how people can write us and you'll be automatically entered into the membership. We are open working groups, we welcome everyone participate, and that's the way we can hear your voice and your comments, observations.

Specifically to the test cases, how we choose languages, in reality we do that in order for software developers that want to test specific scripts in their own realities, but as far as technical testing, we really care about the encoding system. But yeah, be part of that conversation, join our working group sessions and that's when—and if you're not able to participate in the conference calls, the mailing list is always available, documents are always live for the most part, so your input is very welcome.

Next comment or question [inaudible].

MOHAMED ELBASHIR: There were several comments in the chat. I think just for the sake of time, I will read the latest ones. There's many comments that have been already answered. There's a comment from Achara Boonsri. Local initiatives and UA ambassadors must have dedicated focus on governments making them aware of UA issues and ensure that there's UA readiness as part of their RFP government procurement procedures. And GAC, I guess, [you actually] mentioned the GAC could have a role in that.

DENNIS TAN TANAKA: Thank you for that comment, Achara. Our local initiatives and UA ambassador—local initiatives have—it's a group so there's more talent available to them and we try to have local initiatives have a variety of expertise from legal to government policymakers to technical, so they're going to be better equipped to tackle those items. I think they

are doing that . Our UA ambassadors, some are more technically oriented, some are more academic or training-, education-oriented. And again, these are based on volunteers and people want to gather themselves and organize themselves in order to advocate for UA in different avenues. So we try to do that going to the software developers, governments in the capacity that we can. We cannot force anybody that is not comfortable doing a role to fulfill another thing.

MOHAMED ELBASHIR: Thank you, Dennis. There is also a comment on the chat from Yuri Kargapolov. He's saying that, "As a community, we have spent almost a year ago discussing the UA readiness framework for software. And is it a time now for the UASG to do that work and not rely on vendors? Can we move on successfully without a framework? You cannot start a conversation with any government stakeholder if you cannot show them something tangible. They already know the IDN problem."

DENNIS TAN TANAKA: So the question is a multi-part question, right? It talks about the readiness framework, referring to UASG [inaudible] is that it?

MOHAMED ELBASHIR: Correct, yes.

DENNIS TAN TANAKA: I believe so. Okay. So that's one. And also, the question is, why the framework, second, why do we engage with vendors and not take the work on ourselves. I think that's a two-part question. Is that right?

MOHAMED ELBASHIR: Yes.

DENNIS TAN TANAKA: Okay, so the need for the framework came to be because we needed a way to—first, if we wanted to measure readiness over time, we needed a common platform, common framework so that every time we measure readiness, we are measuring apples to apples and every time we do not come up with how do we measure this and that. So we try to look at a very holistic approach: how do we measure UA in general? Right? So we devise a framework that could apply broadly to a software developer that wanted to do their own readiness analysis or UASG wanted to do their own analysis. And you can take the framework as a guidance. So that's the basis for the readiness framework.

So a tool that will give us consistent, predictable approach as to how do we measure from time to time. And second, can the measurement and the analysis or whatnot, do through vendors or ourselves. I mean, certain work that we can do ourselves, we will do it. The question always comes, how to balance the bandwidth of the volunteers with the availability of the information. So in order to balance that, if we want information like now, then we need to engage someone that is

willing to work 24/7. Maybe not 24/7, but put a good amount of hours, a specific set of time to come up with that deliverable. And quite frankly, what we found [inaudible] volunteers cannot do it in a steady way because everybody in the working group has day jobs and reasonably so, day jobs come first. So sometimes what we found is that the work that is put towards UASG lacks or falls behind and then we've done it. We've done this for more than four years now, and that's why for certain work, we need to engage with outside vendors in order to help us go through that in a reasonable time frame so that we have information and act on that information rather than waiting and not do anything about it. That's basically the rationale between it. I hope that answers the question. Sarmad, I think we're two minutes over time so I'll hand it to you. Sorry if we were not able to go through your comments and questions.

SARMAD HUSSAIN: Thank you, Dennis, and thank you to the panelists for the discussion, and also, thank you all for participating and providing feedback. We will take this chat session and extract all the comments and questions and share these with the panelists for their information and further work, also to the UASG leadership for follow-on. Thank you all for joining, and we'll close the session now. Thank you.

DENNIS TAN TANAKA: Thanks. Bye.

[END OF TRANSCRIPTION]