

**Single Letter Names Working Group (sl-wg) Teleconference
TRANSCRIPTION
April 23 2007 19:30 UTC,**

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Attendance:

Greg Shatan - IPC sub working group chair

Neal Blair - CBUC

Marilyn Cade - CBUC

Mike Rodenbaugh - CBUC

Alistair Dixon - CBUC

Avri Doria - Nominating Committee appointee to the GNSO Council

Invited guests:

Mark McFadden

Steve Bellovin

Absent - apologies

Jon Nevett

ICANN Staff:

Patrick Jones - Registry Liaison Manager

Glen de Saint Géry - Secretariat

Coordinator: At this time I would like to inform everyone that today's conference is being recorded. Should you have any objections, you may disconnect at this time.

Thank you sir, you may go ahead.

Greg Shatan: Thank you.

This is Greg Shatan and welcome to the special call of the Single and Two Character Name Subcommittee of the Reserved Name Working Group.

This call is special and that we have two special guests. And I'll let -- perhaps each of them -- introduce themselves and in addition take roll here for our regular committee members.

I believe we have Mike Rodenbaugh.

Alistair Dixon?

Alistair Dixon: Yup. Yes.

Greg Shatan: Patrick Jones?

Patrick Jones: Yes.

Greg Shatan: Avri Doria?

Avri Doria: Yup.

Greg Shatan: Marilyn Cade?

Marilyn Cade: Yes.

Greg Shatan: And if I left anybody else out.

Glen Desaintgery: Neal Blair.

Man: Neal Blair.

Greg Shatan: Neal Blair.

And our two special guests are Mark McFadden and Steve Bellovin.

And, why don't you each tell us a little bit about yourself and your technical background and expertise which is the reason for today's call.

Mark, why don't you begin, please.

Mark McFadden: Thanks.

My name is Mark McFadden. I'm the principal technical analyst for naming, numbering and addressing at British Telecom. In ICANN I'm a member of the ISP Constituency on the Secretariat.

I was also part of the first RSTEP review which reviewed wildcards one more time last fall.

My background in DNS ages back into the very early 1990s where I was in ISP in the Midwestern part of the United States.

I think that's good enough. Why don't we go to Steve?

Greg Shatan: Steve?

Steve Bellovin: Yeah.

I'm Steve Bellovin, currently a professor at Columbia University, formally with Bell Labs and AT&T Labs. I've been working with various pieces of Internet technology since about 1982 or so.

Formerly of the IAD and formerly security area director of the (IATS). A member of the DNS directorates which - is a member of the (unintelligible) Committee to a I (unintelligible) time where mostly I work on security staff.

I also work on quite a variety of Internet or other Internet related issues and my first - describes in DNS security issues in '89 and '91. So, I've been doing this for a long time as well.

Greg Shatan: Okay. Well, thank you both.

The reason for this call is - as you both may know, we are looking into an understanding better the issues of technical issues and other issues around the reservation of a single and two character names both at the first and second and to some extent of the third level.

And we find it necessary in order to move forward in our analysis of the situation to get a better understanding of some of the technical issues and of use of the technical community in order to move forward.

We have some questions that have been, you know, put together by members of this committee but I think there would also be a chance for open discussion and for questions from the floor.

So, I think we can begin this by looking at the recommendations that this committee made initially with regard to single and two character names.

But, for the most part we - the recommendation was that there be more work. And this is now the more work period.

Marilyn Cade: Greg...

Greg Shatan: Yes.

Marilyn Cade: ..., it's Marilyn.

I think everyone knows this, but I might just make a comment that when we started out we were looking at the broad category of single and two letter characters encompassing single letter numbers, numbers themselves and symbols but due to completing one stage of work, symbols have now been - basically we already have a recommendation on (MN).

So, for purposes of this discussion we are just focusing on numbers and letters. And that's probably worth saying since to our technical colleagues characters may appear to encompass all three of those subcategories.

Greg Shatan: Right.

And then, separately there are also issues in the IDN space.

Marilyn Cade: To which we're inviting a different set of technical folks.

Greg Shatan: Yes.

Marilyn Cade: Yes.

Greg Shatan: I think it would be helpful to - we can approach this on a number of different ways but I think it would be helpful to look at the issues at the top level first if anybody thinks otherwise, and talk about what the issues are in using single and two letter - single and two number and combination of letter and number - two character names at the top level. Understanding both the technical issues and what might be seen as any other issues that we probably haven't (slept) in.

Marilyn Cade: Before we do that can I just ask a question/clarification.

On the two letter characters at the top level, don't we actually have a recommendation from our earlier work on that?

Man: Obviously there's no technical issue around this in the country codes.

Marilyn Cade: Right.

Man: We don't need to...

Greg Shatan: Right.

Man: ...discuss this Greg.

Greg Shatan: Right. We probably don't need to discuss that. That's not a technical issue.

Marilyn Cade: Yeah. The - it may be a political issue or policy issue, but I don't think it's a technical issue.

Greg Shatan: Right. So...

Marilyn Cade: And that might be helpful. If everyone agrees to take that off the list, then that gives us more time on the other topics. Does that make sense?

Greg Shatan: This is Greg, I think so.

If anybody doesn't think that makes sense, now is the time to say so.

I think we have consensus on that.

Marilyn Cade: So that leaves us then Greg with single letters and single numbers to discuss separately at the top level. Would that be right?

Greg Shatan: Yes. And also, I guess one letter and one number or two numbers.

Marilyn Cade: Oh good. Okay. Right.

So, we've got four subcategories.

Greg Shatan: Right.

Marilyn Cade: Okay.

Greg Shatan: And I guess we could just sense - throw it open to the experts as to what the technical issues are in single letter, single number, and letter number combinations and number number.

Steve Bellovin: Okay. This is Steve.

I think that having a top level name of all digit is a very bad idea because it creates ambiguity. And though already - all numeric labeled at the second level -- 163.net for example, there are many programs out there that when they see a string of digits did - period digits and so on, try to post that as an IP address rather than as a name. And don't do the name (unintelligible).

Users don't see this very much because they wouldn't commonly do it. Just the administrators - network administration do this quite frequently and creating this kind of ambiguity is not a good idea.

Mike Rodenbaugh: So, Steve, are you saying that - this is Mike Rodenbaugh. Are you saying that regardless of the link of the TLD string, if the tall numbers did not - it's going to cause application errors?

Steve Bellovin: I think it got - I think it has a high probability of doing so.

Man: Yeah.

Steve Bellovin: If you wanted to say that only things that were exactly four octet or the (unintelligible) 255 could possibly be an IP address that's fine. I'm quite certain that there's some code there out that doesn't honor that. There is some codes.

I have to go - double check to see if it's newer versions of Unix, but there are systems out there, we - if you type 127.1 and it will interpret that as 127.0.0.1, is - that you left out the middle zeros.

Maybe that (unintelligible) has been done but it's absolutely what's done 20 plus years ago and a lot of that code I believe is still lying around.

It's a little bit - goes down this passing. Just looks like an all numeric address. It's all numeric and (Mike) - (Mark) recovered. And of course you could end up with ambiguity and you would end up with complexity.

If ICANN doesn't control what happen at lower level, there are names like 163.net where we have all numeric at the second level today. And we certainly have no control over what they put below that.

Man: It isn't fair to say your issue is not then with combinations, letters and numbers, it's only if it's all digits.

Steve Bellovin: Absolutely. Absolutely. All digit is the problem.

At the second, you know, there are not second level names that start with a digit like (unintelligible) issue of our (unintelligible) correctly 10-12 years ago.

So I think we can be confident that combinations of letters and digits even if they don't start with a letter will work correctly. It's been out there for long enough. (3Com) was completely 1.8, very major

networking player the people adapted to. But all digits I would not - at the top level I think it would be a very bad idea.

Marilyn Cade: And - it's Marilyn.

I thought I recalled that there was an RFC, Patrick, that said something related to this topic about domain names need to start and stop with the letter but (3Com) would be a - at the second level. And other examples would be a variation on that. Is that not right?

Patrick Jones: Yeah, that's RFC1030. This is Patrick and it's RFC1035.

Marilyn Cade: Uh-huh.

Patrick Jones: It says, the domain names must start with a letter and with a digit - a letter or digit and have as interior characters only letters, digits and hyphens.

Marilyn Cade: Uh-huh.

Man: Exactly, these are with the older RFCs that there was a past - that - with 865 if I recall correctly. Let's just assume it's one of those right of the shack.

But the DNS -- I have to say this -- the DNS itself is capable of handling anything but the applications software frequency is not. When the application ...

Man: Right.

Man: ...(unintelligible).

Man: Right.

Man: And at (3Com) (Unintelligible) issue, I got the impression there was a political side about that but I was not clubbed enough at that time to know just what the details were.

Man: I'd say the practical basis - the taskforce should certainly consider breaking up the problem space into a group of area, what the name space itself allow it for and what the underlying resolvers are capable of.

Like Steve has pointed out, what happens at the application layer? And those are three separate considerations for the taskforce I think.

One thing to know is, that if all of you are really interested in was the rules for the name space, the rules the rules for the name state that the labels can be - well, the rules actually say that they can be between 0 and 63 characters.

Of course, a zero length label is a very special case that's reserved for the root.

But, the name space itself are those supports -- and Steve can help me here -- they could - 1034 says that the name space allows for 0 to 63 character labels with the - no label being a very special case.

That doesn't mean that our resolvers in the history of the DNS have been able to handle one character TLD. By RFC, they're supposed to

be able to but I - we know that there's all versions of buy in and existence that presumes that there were at least two characters in the TLD.

That's not a requirement but handles a very - there's a relatively old versions of buy in but they have something to know of at the resolver level that DNS server and the class would talk to it - may have made decisions, may have made application level decisions that have - that are nor related to the RFC.

And as Steve points out about the application layer, it's extremely important as well because we know that there are browsers for instance we may see what they consider to be malformed DNS string and attempt to massage the strings into some other format.

Man: That's right.

Man: So that's something for the taskforce to consider.

So, I would say even though I've been privy to see the questions that you have, maybe organizing your thinking into these three separate problem areas is something that will help guide your work.

Avri Doria: This is Avri. And those - in the old buy in isn't that pretty - and by the way this is Avri speaking.

Man: (Hello).

Avri Doria: Isn't that pretty much the same? Ones that probably weren't able to handle the four or five letter TLDs also because they had assumed that there were either two or three and nothing (bad).

And so - and would you think though that something like that should be a constraint on new TLDs and policies on New TLDs, but there maybe some broken or old buy in out there?

Man: I'm not very sympathetic to people running ancient copies of buy in, but oftentimes there's reasons for it. They're in places where the economics does not allow for a machine on which a newer version of buy in will run.

Let me pursue that question secondly.

The first question you asked was about the labels at the top level domain that were longer than three characters.

In my experience when that happen the problem was primarily not in buy in or in other piece of the server software, the problem was at that the application layer. What you have is application programmers...

Man: Right.

Man: ...mistakenly thinking that the - there's was this limitation. They didn't see .arpa so they didn't know about it. And so they mistakenly thought that .net, .org reflected a certainty in the main space that wasn't indeed there.

And then in .travel and .aero and .info and so on, (up heard) are the limitations for that application software but came immediately (up heard).

For people wanting relatively recent versions of buy in, we didn't see a terrific number of problems there. It was much, much more the application layer Avri.

Avri Doria: Okay.

Patrick Jones: Avri and Mark, this is Patrick. The RSTEP review of the dot name proposal for limited release for two characters, did a honey pot test to see if there were problems with resolvers, reading - no tld.tld. And they didn't find a lot of problems with the old resolver. In fact they found it was not a major technical issue.

So, if it helps anything, there at least has been a task that could help.

Man: Yeah. There - it's good that there's a task that ensures that in the business. That code that has been there has never been tested. It probably doesn't work.

There's just been too many examples of what that - no one ever knew (if this works) or no one ever sets it properly.

Marilyn Cade: So, one can ask a - so single letters at the top level which is what we're talking about - I know we have limited time so I'm going to propose we move along.

We seem to - well, we seem to have a general view that all numbers in all level are bad and that single letters by themselves at the top level. Maybe we could just go back to - there are no single letters allocated today at the top level.

ICANN in the past did reject one single letter application that I recall -- I.

Is there anything else in relation to single letters at the top level that you guys would comment on before we talk about single letters -- sorry -- then Greg, do you want to talk about single numbers at the top level if there's anything further to talk to about that?

Greg Shatan: Right.

Marilyn Cade: Okay.

There's - are there any other comments about single letters at the top level other than they - the (unintelligible) today and...

Steve Bellovin: This is the sort of thing that would be good to do a - that more - at more scale to find out. If so - if we're talking about a 10% failure rate we're not going to know what was a - or 5%, we're not going to know, it is a very small depth.

Woman: Right.

Steve Bellovin: But the notes that look at the application is very important. That's what dominate a lot of the IDF discussions and IDM for example. It's not what the DNS can handle but what the applications can handle.

Marilyn Cade: And Steve - and let me ask you a follow-up question because this is going to be related. And maybe - I hold this question just put it on the parking lot but come to it, and that is, the existence of a single letter.single letter as well as the existence of number.number. You spoke already about the coexistence or the problem with number.number. Is there a problem with singleletter.single letter?

And then we would talk about that more when we talk about single letters at the top - at the second level?

Steve Bellovin: I don't know of any problem with singleletter.singleletter, but I do caution that the RFC1535 poses an issue. A couple more of what we discussed..

Yeah. The RFC1535 poses an issue and I'm going to those in a bit.

Marilyn Cade: Okay.

Greg Shatan: Thank you.

Now, is there anything - let's - taking it to the top level, it sounds like we - digits of the first level where there're one, two or even more which is inside the scope of this subgroup, your opinion that would be a bad idea and a high probability of technical confusion.

Man: Yes.

Greg Shatan: And with single letters on their own, it doesn't sound that - if I could summarize it sounds like if the issues there might arise from running an old buy in.

Man: Well, it's the only issue that I know of. I frankly haven't even heard of that until just now. I don't know of any architectural issues of single letter at the top level.

The combination of single letter at the top level - on the second level is more problematic. But at the top level alone I don't see an issue.

Greg Shatan: Does anybody know how - what the sense is of old buy in out there?

Marilyn Cade: Well, can I just say something about - when we say old buy in -- and maybe Mark, you, or Steve may want to comment on this. I just spent the last week at the ITU development sector and I think the question is not just old versions of buy in but the support that's needed to coach people through the changes or the financial investment that's needed for them to make other kinds of upgrades in the equipment systems they're operating.

Man: Of this I'm pretty certain I've seen public surveys or versions of buy in that are out there and that would be the starting point. So, I think we want to know where they're located if we saw any significant number of that.

But, I believe that's not questioned in the study. It's probably just from the security perspective.

Marilyn Cade: Probably (Susan Willis) might know.

Man: She'd be a good person to ask but I think it's also - I think that's been - (what to probably expect) where (unintelligible) simply because of security on some older versions of buy in and often security people who studied the question of when different versions were deployed after the security alerts came out.

Mark McFadden: I also think Marilyn that there's

((Crosstalk))

Mark McFadden: ... - there's recently been a panel at (Manalog) on that.

I'm - just say distribution graph on versions of buy in. And so, that's another place to look.

Man: Right.

Mike Rodenbaugh: And Mark, a follow up question on all of this. This is Mike Rodenbaugh.

How far back - how old a version are we talking about here?

((Crosstalk))

Mark McFadden: We're talking old. We're talking in the 1990s now.

But remember that there are lot of places in the network that are at the edges of the network where people are providing ISP services, trend of

services, and name resolution on a shoestring on hand me down equipments.

We're so used to in many parts of the developed world large-scale enterprise class networks being the way that people get access to the network and so those people have the most up to date copies of servers and of caching service in place they have the works. Right?

It's important to remember that there are places -- and Steve is exactly right -- we worry about them because of security issues but we also worry about them because of holes - things that they're not capable of doing that we expect the modern DNS to be able to do.

So, that's where they are. And they tend not to be in places like Washington DC, but they do tend to be in less developed places in the Internet.

Alistair Dixon: Can I ask you a question, its Alistair here.

So, if for example these single character or single letter top level domains were released and they were these pieces of the structure out via (this) aren't able to resolve these characters. Does that cause a security and stability issue?

Man: The - it's probably not a security issue but it does create a rigibility issue. People under these don't - won't be reachable by users in such places.

Man: Right.

Marilyn Cade: And I'll just flag a GAC principle not to dwell on it right now but we certainly were strongly encouraged by the Government Advisory Committee to ensure that we are sensitive to the impact on the developing country.

But on a technical side, Steve we're going - when we talk about the second level - at the second level single letters, then you're going to talk about the coexistent issues. Is that right?

Steve Bellovin: Correct.

Marilyn Cade: Okay.

Greg, do you think then we're - so it sounds to me like we're saying it's - we have to hear the rest of the story at the second level before we know whether there's a problem at the top level on single letters. And on numbers we have an answer.

So, does that mean we're ready to talk about combinations of numbers and letters at the top level?

Greg Shatan: Yes, I think we are Marilyn.

I guess I - this is Greg. I'll ask our technical experts what their thought are on letter number and number letter. Two character top level domains.

Marilyn Cade: So can you give an example?

Greg Shatan: Like .1B.

Avri Doria: Dot A1.

Greg Shatan: Yes.

Man: I think it is unlikely to cause a problem per se.

Now, I'm assuming that symbols are completely off (I'll say) for many reasons.

Man: Yes.

Man: Symbols would make that much worse.

But I do not think there's likely to be a problem with (license) again. There maybe some older version that has these wired in something that it - it's was a two letter TLD or one of the old three letter ones.

But it's not a high probability of failure Mark in - apparently there might be but it's not what I was worried about (unintelligible).

Man: I think this is much less likely actually than the initial case that we have.

First of all there's - at the application layer there's unlikely - I think when an application sees a mix of letters and numbers, it's unlikely to try to force some interpretation of that as an IP address. That's very unlikely it seems to me. And then, the application layer wouldn't know what else to do.

I find it very hard to believe that there would be application layer problems there. Again, accepting the folks who have made mistaken assumptions about what the name space actually looks like.

And I don't think that's within - well, I would advise you that other people making mistakes about the same space is not in scope for your taskforce.

Man: Uh-huh.

Man: That would just be a piece of advice I guess.

But no - I agree with Steve here. I think it's very unlikely that that's a problem.

Greg Shatan: yeah, again, you know, we can thank (3Com) for doing that (table) 12 years ago.

Marilyn Cade: And so - so then, do - have we then covered in the earlier discussion the combination of numbers that is 1.1 or 1.2 because we've already addressed the issue of the possibility being misinterpreted as an IP address?

Man: Right.

All digits at the top level, I think it's a bad idea no matter what the length.

Man: Right. You know, I don't know where you're going with that Marilyn. But on the other hand I think that 192...

((Crosstalk))

Man: ... - I'll pick a better example. My home address is 513, so 513.com I think is - what was inbound so it wouldn't be a problem.

Marilyn Cade: Oh, but that's not the question. Sorry.

Why are you three summarizing that since we set a single letter - a single number at the top level was a bad idea, double numbers at the top level would be a bad idea?

((Crosstalk))

Greg Shatan: ...statement.66 or something like that.

Man: Yeah, I'm sorry. I misunderstood.

Marilyn Cade: Yeah...

((Crosstalk))

Greg Shatan: We haven't moved to the second level yet. We're sticking to the top level until we beat it to the ground.

Man: Excellent. I'll stand here and watch.

Greg Shatan: So, something like statement.66 would still be an issue.

Man: Yeah, it's not that 6 is, you know, 163.66 is ambiguous parse.

Greg Shatan: Right.

Alistair Dixon: So, if there was for example the possibility of having numbers at the top level, and - but a requirement on the letters could be at levels below there, would that still be a problem?

Man: I don't see a problem with that per se but I would have to think. But, if you start getting to the enforcement question and you already have on numeric ones under - from December to gTLD to date.

Man: Right.

Man: So that because of fairly difficult political issue, you may not stake your name to this new TLD.

Marilyn Cade: And I think - Patrick, did our - did the staff survey - I think it showed up that there are numbers at the second level and a number of ccTLDs as well as gTLDs. Isn't that right?

Patrick Jones: That's correct.

Marilyn Cade: And is - my conversations with ccTLD managers - just briefly I just talked about six or seven of them and they don't have provisions on the numbers of the second level generally.

Greg Shatan: So then it sounds like we have to take it as a given that there will be all number TLDs and - as well as mixed number letter TLDs -- I'm sorry -- the second level domains.

Woman: Right.

Greg Shatan: They'll be mixed number letter on all number - second level domains and at least some domain.

Man: Right.

Man: Most of them I believe was.

Man: Yeah. We have to assume because that's the case today.

Greg Shatan: Yes.

Marilyn Cade: So I would - it's Marilyn. So I would take that to mean that the preexisting condition is going to create a limitation on numbers of any - numbers on any number at the top level.

And, I'm going to put that as a summary note.

And - then are we ready to move on?

Avri Doria: Can I ask one question? Just one quick one on something.

When we're saying all symbols, we're including the dash, correct?

Marilyn Cade: Actually, we haven't talked about symbols at all.

Avri Doria: Right. We excluded them - we excluded symbols saying that they were out of scope and we've talked about letters and numbers, but within

the LDH we still have the dash and I'm never really sure whether that counts as a symbol or not.

Are we excluding symbols? I mean, are we excluding dashes?

Man: Dash is acceptable because it's been there forever.

Avri Doria: Okay.

So, dash even in - so a dash 1 or an A dash should...

Marilyn Cade: Well, wait a minute. Avri, I think we need to (frame) this.

Avri Doria: Because we talked about letters and we talk about digits...

((Crosstalk))

Avri Doria: ...symbols but they're still...

Marilyn Cade: Yeah.

((Crosstalk))

Avri Doria: ...the dash hanging on. Could you have...

Marilyn Cade: Sure. But...

((Crosstalk))

Avri Doria: A single dash in a TLD.

Marilyn Cade: Avri, so what you're suggesting -- and this may be right Greg and Patrick -- the recommendation we made about symbols which is that the present limitation stand I took to include the dash.

Are you raising the question...

Avri Doria: I'm never - I've never been quite sure whether it's included...

Marilyn Cade: Okay.

Avri Doria: ...because we differentiate between the LDH and symbols.

Marilyn Cade: So you're...

Avri Doria: And so, my question is...

Marilyn Cade: Yeah.

Avri Doria: ..., when we - where does the dash fall? Is the dash acceptable in that? I mean, it is just one character. It is a symbol yet it's generally not treated like a symbol.

Marilyn Cade: So Avri, would you give an example maybe that would be like - could I then dot dash.

Avri Doria: Could you have a dot dash or could you have a dot a dash or a dot - and if this goes one-step further, a dot dash 9.

Greg Shatan: Or a dot dash dash for that matter.

Avri Doria: Or a dot dash dash, yeah.

Marilyn Cade: Well, I am convinced but I have no idea why anyone want those names, but I'm dying to hear the technical experts comments.

Avri Doria: Right. I'm just (unintelligible) for completeness in looking...

Greg Shatan: Yes.

Avri Doria: ...at a stuff I wasn't sure (unintelligible).

Greg Shatan: With some unacceptable characters...

((Crosstalk))

Avri Doria: ...dot dash, but anyway.

Man: Dot that have domain names and (Morse) codes, yes.

I think I would want to do a bit of a survey about dash as a first character because the historical didn't permit it. There might be a couple of persons out there that would object.

Dash has worked well on intermediate level - on lower level names. I don't regard it as likely to cause trouble but it's a sort of quantitative that I bet no one has ever tried.

Marilyn Cade: And, let me just ask you a question Avri.

You may be more of the expert on - so, what's the naming -- Matthew and Patrick -- what's the naming convention that we had in IDN? Is a dash-dash letter-letter or...

Avri Doria: Well no, that's the letter-letter dash-dash.

Marilyn Cade: All right, letter-letter dash-dash.

Avri Doria: Right.

And so, yeah. Now, that's probably - dash-dash and the (unintelligible) position...

Marilyn Cade: Uh-huh.

Avri Doria: ...is already special case.

((Crosstalk))

Marilyn Cade: So we would know that we couldn't have - we know we can't have that combination.

Avri Doria: Right, but...

Marilyn Cade: Uh-huh.

Right.

Avri Doria: And letters in IDN and at the moment I'm letters - extend dash-dash-dash is the only things we could have, but that's a different issue, completely a different subgroup.

Marilyn Cade: Uh-huh.

So you've asked that as a question mark. Are you - do you have and comment on that or do we just take it as Steve suggested that it takes more thinking and move on at this point?

Man: I would think it takes a real - I'm sure with Steve here, I think it takes and little research. I was just thinking back to where this all came from and we have sort of a history in the file that used to be called the host file.

Marilyn Cade: Right.

Man: And I'm trying to remember, in that case, whether or not dash was permitted as a character there.

((Crosstalk))

Man: It's was permitted in the host file, but I think not as the first character of the name. We have authorized dash (unintelligible) in the old (host.text) file.

Man: And so, I guess that's where I would put a warning flag, Marilyn...

Marilyn Cade: Uh-huh.

Man: ..., if that dash is the initial character, it's something that needs to be looked into.

Marilyn Cade: Uh-huh. Okay.

Avri, I just captured that. Does that sound...

Avri Doria: Yes. So, following that logic, that would mean that a single dash obviously is in the cautionary (tail) and as is a dash-letter, dash-digit. And that those would be - but that we also don't know at the moment. That leaves hope in the question of the letter-dash, digit-dash.

Man: Letter-dash, digit-dash is likely to work.

Man: Yeah. That - I think there's empirical evidence that that works in some cTLDs. I think there is - I think we know in fact that letter-dash or digit-dash do actually work perfectly.

Marilyn Cade: Yes, but that's not what I heard. Letter digit is three - I'm going to call that three characters. Letter dash digit dash is four characters.

((Crosstalk))

Man: No, letter-dash comma digit dash.

Marilyn Cade: Yes. I was listening to the examples. Sorry.

Man: Boy, I was (swearing there), Marilyn. Let me reparse that for you.

Marilyn Cade: Yes.

Man: So the examples of letter-dash or digit-dash...

Marilyn Cade: Oh, got it, sorry. I was stringing them together. Thank you.

Man: We can't speak anything longer than two characters in the sample.

Avri Doria: I know this was improbable, but you know, it didn't say we're part of the (LDA) so I was just kind of curious for completeness sake.

Man: Yes.

((Crosstalk))

Man: Virtually, the issue, I don't expect trouble.

Marilyn Cade: I know we're running out of time. Can we move to single letters...

((Crosstalk))

Man: ...Marilyn.

I know we were running out of time (now). We just spent a lot of time talking about hyphen and then a couple of follow up questions on the single letters mark if you don't mind.

You're mentioning that this pre-2000 resolvers, are you certain that there are some versions of buy in that will look for a TLD of at least two characters? Is that what you're saying today?

Man: Right. That the resolver...

Man: Okay.

Man: ...itself would actually return an X domain for queries against single character TLDs.

((Crosstalk))

Man: But Avri asked me a question which I never answered and she asked me the question, "Well, how many are there and do we really care?"

The answer to the question do we really care is a policy question and while I have a strong feeling about that, that's not what you're asking me.

And then Avri also asked me, "How many out there?" And I think that's simply a matter of research. There already have been studies. I know operations groups have been interested in that question for a variety of reasons -- spam and security -- and that's something that you can get some empirical data for.

Man: Okay.

Man: Okay.

Man: If...

((Crosstalk))

Man: If I were to characterize it Mike, it's very, very small.

Avri Doria: And we already have made pressure on people in other areas to update those because of the security and other issues.

Man: Right. Okay.

Marilyn Cade: It's not - for the policy issue. It's really not something that we should be considering. Is that what you're saying, Avri?

Avri Doria: I guess, yeah. I mean - I guess my general policy view on it is that since people already have a good reason why they should be upgrading for security and other reasons that yeah, I would not worry about broken application as a policy reason to not do.

Marilyn Cade: I'm going to disagree with that though, Avri. As a business user, I can understand that we may want not to worry about broken applications, but as and business user and on behalf of the business, you know, just the business constituency, we do worry about broken application and we worry about traffic that can't be delivered.

So I guess I'm going to just reserve the - I think we do - we're asking technical questions today...

Avri Doria: Yes.

Marilyn Cade: ...but ultimately, the GNSO makes policy recommendation.

Avri Doria: Right.

Marilyn Cade: Right?

Man: Okay.

((Crosstalk))

Man: Go ahead, Mark. Sorry.

Mark McFadden: I was just going to say to Avri that in the case where ICANN approve TLDs that have more than three characters, even though people have broken applications, someone had to pay the bill. Someone have to answer the phone when you couldn't send mails - an SMCP address that ended in .travel. Someone had to answer that phone.

And so, there is a real operational cost associated. We're saying well, if someone has a broken application cost, fix it.

Man: Uh-huh.

Marilyn Cade: And then maybe, you know, Mark, any you were heavily involved in trying to reach out to the industry and educate some of the parties as I was, but not to the level you were about what role they might have in fixing it and in sometimes cases, it is a very appropriate education issue in other cases it's just a lack of resources. But maybe...

Mark McFadden: I think, Marilyn, we strayed from the technical issues here (in our peril), but if a proposal was made to have a single character - a single letter, a single number TLDs, part of such a proposal would not have to - not just be the addressing the technical issues associated with that,

but how you get the word out, how you would do outreach and education.

Marilyn Cade: Right, exactly.

Avri Doria: And of course, the problem would only really be with the first one.

Marilyn Cade: I don't know if that's what .info and .travel and .museum actually found.

Avri Doria: Okay. Well, this does go in to a tangent, so yeah.

Man: Yes.

Greg Shatan: Well, this is Greg. Is there anything else left at the top level?

I'm thinking - I'm not - the one thing I'm not sure we've completely resolved and I'm not saying we haven't, I'm not just sure, is the single letter question.

Marilyn Cade: But we can't resolve it's until we talk about single letter at the second level. But maybe we could do that first and then go back?

Greg Shatan: So we can talk about them together. Although - I guess my thinking is, if we assume there are no single letters at the first - at the second level, do we have a problem with single letters at the first level?

Marilyn Cade: But you can't assume that because you've got the same problem, Greg. There's a...

Greg Shatan: There already are so.

Marilyn Cade: There's a (larger)...

Greg Shatan: Yes.

Marilyn Cade: ...space...

Greg Shatan: Yes.

Marilyn Cade: ...in the ccTLD, a lesser install base in the gTLD, but a larger install base in the ccTLD.

Greg Shatan: I see. So it's really - it's better to make the opposite assumption which is that we will have single letter because we do have some. We may or may not have more but we do have some single letters at the second level and therefore, single letters at the first level have to review them at content.

So why don't we move on to the second level and just segue into single letters at the second level within of that single letters at the first level and throw it open to are technical experts.

Man: Okay. So we know that it works at least to a reasonable extent because there is some of that at the second level. The concern that I have is RFC15 - we can read RFC1535.

Now, 1535 talks about security issues when you get conflict names between different levels and the resolver is trying to be too helpful and try different search orders for you and which is in fact quite commonly the case.

We've seen browsers that can give a single word like (ten.com) for example. In many of the sites we'll have a list of domain names per type to search.

And problems actually happen some years ago with the Czechoslovakian domain. Now, that's not out there anymore of course because of the political issue of the Czech Republic, but they were .cs. A lot of computer science department are .cs.

And because of the search order, it ended up, you know, if you want it to go to your department mail server, mail.cs dot something edu you'll end up at mail.cs in Czechoslovakia.

And if you have search orders and if you have single, you know, we already have problems with .com - .edu, .com I believe was the one that triggered RFC1535.

We have single letters at the top level and the second level. I think it's creating more potential for that to happen. So I am concerned there.

Mike Rodenbaugh: So, I just want - I'm sorry, Steve. It's Mike Rodenbaugh, again. I want to make sure I'm clear on what you're saying that single letter at the top level are not such a problem as far as you're concerned because of this buy in issue that Mark is talking about earlier.

If they don't exist at the top, they don't exist at the second level, correct? But of course they - we all know they existed at the second level so the point is...

Man: There are two reasons for being careful about putting single letters at the top level. One is that buy in issue. The other is - given that they exist at the second level, second - singleletter.singleletter, is that - something .singleletter.singleletter has got potential for confusion because of the search order problem.

Man: And that's an application issue that's just been developed through by the browser manufacturers?

Steve Bellovin: Not even browses the search order goes way, way back.

Man: Okay.

Steve Bellovin: It goes back to - it probably goes back to the earliest days of (brokly) units with the (ttTLD) code to try to make it friendly to a user community which is just transitioning away from the flat name space in the old (hosts.text) files.

Is that people didn't want to type whole long strings, they weren't used to it. So the search order was an abbreviation.

Then try - one variant of this on auto qualified is in (unintelligible) of the mail standard but there are other examples of it as well in the name of user friendliness.

And the problem is, when people are using these systems that do search orders, they may not even be aware of the search order, but they can get - they get (unintelligible) with this.

Frequently individuals who don't control the search order. It's - whoever is administrative assistance or sometimes their ISP.

Man: What if we consider the issue of single letters at the second level in the absence of single letters at the top level? How does that - or is that - since we've seen at work I would assume it does work although there reservations or pieces of reservations existing for a single letter to the second level?

Man: I am not aware of any problems with that - with that - with single letters at the second level and those single letters at the top level.

Man: And once again from the second of the RSTEP reports, we have some empirical data to work with there.

First of all, it's prevalent in the fact that I think the RSTEP report even has a statement about how well it works, if I remember the report right.

And so, I just - I don't think that - I don't think that there is a technical issue there at all. And I think there's an empirical data to back that up.

Man: That certainly might take time.

Marilyn Cade: So then - and we've already covered numbers. And have we covered combination at the second level?

Man: I don't think we have covered them yet. So something like, you know, v6.com.

Man: We've got v6.com, we've got 3com.com, we've got 163.net. Even if we (awarded) that there'll be a problem. There too much of it out there.

Man: 3m.com is another example.

Man: Yeah.

Man: No. And even before Avri asked us 3-.com is going to be fine. And a-.com is going to be fine.

Marilyn Cade: So I'm just capturing this as combination of dash plus letter or dash plus numbers at second level should be okay.

Man: It was the other way around now. And we'd - I think - Steve and I are both - I think Steve and I are both recommending against using dash at the...

Marilyn Cade: At the first. Yes...

((Crosstalk))

Marilyn Cade: ...yes, yes. I just realized that. Thank you.

Letter-dash, right?

Man: Letter-dash, number-dash are accessible technically. Dash-letter, dash-number are expected to cause...

((Crosstalk))

Marilyn Cade: Right.

Man: ... - high probability of causing problems.

Marilyn Cade: I finally got it. Thank you.

Man: And I'm also unaware, to sort of flush that out, I'm unaware of any problem associated with having the dash as the trailing character.

Marilyn Cade: However, unattractive that maybe.

Just joking.

Man: Sometimes it's good to come up with some reason for it only to stand out.

Marilyn Cade: Yeah.

Man: It don't pose any problem. I don't have of any problems withdrawing that.

Marilyn Cade: Okay.

((Crosstalk))

Man: So it sounds...

((Crosstalk))

Man: ...in the second level...

Man: ...one don't think it's tremendously likely.

Man: Those two characters at the second level seem that the only issues we would see would be all digits or dash digit or dash letter.

Man: We have all digits already. I haven't seen a study of two digits combination at the second level but we know there are three.

Marilyn Cade: Yeah. But you, Greg, you meant when the two characters is at all levels didn't you?

Greg Shatan: Not necessarily. So I am, you know, looking (and stand corrected) as .69.com as fine then...

Marilyn Cade: Well there are - I thought and Patrick, we can go back and look at the study that Ken did. I know there are three digits - there are three digits, I thought there were some two digits as well.

But we can go back and look.

Man: I believe that there are.

Greg Shatan: It doesn't resolve...

Marilyn Cade: Yeah.

Greg Shatan: ...69.com unfortunately from my - but the Internet policy does resolve as expected.

Man: Perhaps some exercise left for home.

Man: Yes.

I'll try some different two-digit combination.

Marilyn Cade: So - look I'm just looking at the questions that I drafted and that you edited to make sure - should we take a quick look at that and make sure we've covered all these.

Greg Shatan: Yes.

Marilyn Cade: So the examples we went through - we talked about a.a and 1.0...

Man: 111.0 -- those all seem to be...

Marilyn Cade: Right. And 11.0.

We did have some questions about allocations. And probably if we have a minute with our technical experts, it's probably worth just sharing those questions with them as well because I think they probably have a good sense of where the broader technical community may be.

Man: Sure.

Man: (Can)...

Steve Bellovin: I've only got - I really got to drop off on fairly short notice at this point to let go.

Marilyn Cade: Okay.

Man: Continue to Question 10, Marilyn.

Marilyn Cade: Yeah. So, Steve, the question goes like this. I've heard from some of the technical community that they are concerned about the fact that the allocation method might lead to further exploitation or that some care needs to be taken in how (unintelligible) assets such as the 27th ASCII letters or numbers that have certain kinds of identities like one or ten should be allocated.

Given we've removed the idea, we're not going to be recommending numbers at the top level as I heard this and we're not going to be recommending letters at the top level.

That would leave us with allocation questions related to the second level, I think. Is that - does everyone agree with that?

Man: Yes.

Man: Yes.

Marilyn Cade: Okay.

Any comments that you or Mark want to share with us on allocation methods?

Man: I don't see any technical issues. You know, that - as far as I'm concerned in the policy question, you may get some bad issues - aren't

you - squeeze out more small players and big players doing that. But that's the policy issue not a technical issue.

Marilyn Cade: Right.

Man: I completely agree. I think Question No. 10 comes down to policy, there's no technical component there.

Marilyn Cade: Okay.

Man: So can we go back - can we go back to the Question 7 actually?

Marilyn Cade: Yes. Can I ask Steve just real quick?

Steve, you're going to drop off. So if we have - we're doing a transcript. We'll just make sure we get it to you. And at then if you - if we have other questions, can we email them to you?

Steve Bellovin: Sure.

Marilyn Cade: Okay.

Steve Bellovin: Sure.

Marilyn Cade: Thanks. Sorry, Mark. (Mike), I just want to be sure that we lined that up.

Man: No problem. Actually - yeah, I mean, that is kind of the future question and maybe we will send it to Steve as he has to drop off now.

But I just kind of, you know, how - how would we - if we want to recommend further work on single letters from top level to just, you know, have these be the technical discussions that ends all technical discussions -- when and if it ever ends on this issue -- what would need to be done to kind of test that out and see if there would be issues with the singleletter.singleletter that you mentioned with the search ordering applications. And if there would be, you know, issues with the old applications are fine. The old version is fine.

Man: Okay. So - I'm an academic which means that I personally prefer peer review that refers not just one person saying something. I did the study in here of how, but presented as a peer review - peer review venue, let other people - technical people look at and say, "Yes this is right. This is wrong."

To quote the late Senator Moynihan, "You're entitled to your own opinions but you're not entitled to your own fact."

Woman: Uh-huh.

Man: And this is about getting - gathering facts.

I personally give more way to companies that has been looked at technically by other technical people rather than just simply presented as an ICANN meeting or an ICANN working groups meeting.

Marilyn Cade: Steve?

Man: Yeah absolutely.

Marilyn Cade: Yeah. But, Steve, can we ask you a question and then we'll turn to Mark.

But I'm assuming that doing such a study or doing such work and getting comments from peer so to speak, is going to be longer than a six-month effort.

Steve Bellovin: I think - I suspect that can be done in about six months but, you know, it depends on how much of that time gets chewed up upfront with funding proposal, negotiations and so on. But I suspect that this can be done.

You weren't going with operational background in a large perspective. We're not through of this period.

You need someone who's got the ability to go out and look at a lot of different implementations out there rather than just, "Oh here's where I've got on my laptop."

Man: Yeah.

Marilyn Cade: And is that something that ICANN - do you think that's ICANN's job to do?

Man: He's already doing it Marilyn in the IDM space.

Marilyn Cade: They are - and right, they are in the IDM space. But I would ask - and so, would you consider that to be a similar - in order to - proving the ability to introduce any kind of - any kind of name?

Man: So what I would do here in answering a question, I go about it a little differently. I would make sure that you have a very crisp and clear problem statement that you're trying to get the answer to.

Marilyn Cade: Uh-huh.

Man: I genuinely believe that when you ask these questions, some of the questions relate to the structure of the name space, some of the questions relates to how the DNS work...

Marilyn Cade: Uh-huh.

Man: ...or find work in other DNS servers, and some of the questions will work - relate to how...

((Crosstalk))

Man: ...applications deal with that environment.

Marilyn Cade: All right.

Man: And I think that what the passport has to come up with is a very clear set of problem statements or questions that they trend to the technical community and ask for clear advise.

And I think the IDN experience - especially the IDN experience where ICANN has gone out and sought operational expertise...

Marilyn Cade: Uh-huh.

Man: ...from the community to get those answers as it did in occasion with IDN is something that's physically appropriate (mistake).

Marilyn Cade: And that's what I want to understand. You think it could be (masked) in a about a three-year effort as to...

Man: So I think it's going to be three, right - not to be argumentative here, but it's on a three-year effort not because getting the technical answers has taken that long. But getting the pilots straightened out is taking that long.

Marilyn Cade: And so the dash is on the standard side too.

Okay. Okay.

Anything - so...

Man: But we're also going to get. I think it's about political people didn't like the answers they were hearing.

Marilyn Cade: Right.

Man: So they're all in policy reason.

Marilyn Cade: Those cases may not be over. Oh my God.

Man: I'm sure they're not.

But you know that better than I do.

Marilyn Cade: So Greg, what is...?

Greg Shatan: I think there was a call to switch to Question No. 7 or...

Marilyn Cade: I think that's what (Mark) - Mike just said.

Greg Shatan: Yes. So do we have anything further on that?

Marilyn Cade: So what I heard is that the taskforce - we're not the taskforce, we're the working group, but I assume...

Mark McFadden: And we're not really the working group or the subcommittee of the working group.

Marilyn Cade: Yeah. But I was thinking (Mark) I think you made us right that we - or that we would need to recommend to the taskforce a clear set of problem statements and questions.

And those would need to be well documented and clearly thought out, and then potentially turn to the technical community for clear advice so I got that part.

And then...

Mark McFadden: Right.

Marilyn Cade: ...you and Steve were both suggesting that a model might include looking at - a model for process might include looking at the kind of work that's been done on the IDN space. Is that right?

Mark McFadden: And I am really confident of that because first of all, I work with those folks in the first RSTEP committee.

Marilyn Cade: Uh-huh.

Mark McFadden: And they're already sort of set up to go for problems like these.

I think it would be relatively easy for ICANN to take advantage of both their operational, technical and protocol expertise. And I think that you could get an answer from them in a relatively short amount of time. Certainly less than six months as long as the questions were very crisply delineated.

Marilyn Cade: And -- okay, that maybe a different question.

Man: Mark, you said the RSTEP committee could possibly take a look at this.

Mark McFadden: I know, I would -- I'm sorry. And I simply was just speaking from personal experience there because I have worked with (Lehman) in the first RSTEP proposal.

But it's the work that that company did on the IDN (unintelligible) that I've been very impressed with. And its work that is very much down this - down this path where you have a very specific concrete question about a very specific combination of characters and labels, handing it over to people who have both the time and the expertise to give you precise operationally oriented answers. I think it's a very valuable thing to recommend to the taskforce working group subcommittee.

Man: Mark, you're referring to (Autonomica).

Mark McFadden: Right.

Man: And ICANN I believe paid them a consulting fee to do the test, like we pay them some money.

Marilyn Cade: Right.

Mark McFadden: And I would think that a recommendation here is to get through the answers to this question as an operational level...

Man: Yeah.

Mark McFadden: ... not technical level. And then you only have, if you take look at your notes or at least what I've been following along here, you only have a small number of questions leftover. I mean, it's a very...

Marilyn Cade: Right.

Mark McFadden: ...very small set of questions...

Marilyn Cade: Right.

Mark McFadden: And so, while (Autonomica) was paid let's say an amount of money for doing the IDN work, I don't think it would be anywhere close to that scope to get the answers to these questions.

Marilyn Cade: And on the prime understanding you - to say is that I might call this the scouting that (Autonomica) did in order to verify and check out IDN

capabilities. It would be sort of that same scouting effort that they would undertake.

Meaning...

Mark McFadden: Yeah. Scouting -- I might look for a different word as...

Marilyn Cade: Yeah.

Mark McFadden: ...as it so often happens between the two of us, but it's something like that.

You know, it's a technical proof-of-concept. It's the answer to very specifically - very specific questions that we have about very particular labels at this point.

Marilyn Cade: And - but also knowing broadly who to ask.

Mark McFadden: Right. Because you - ICANN has confidence in a group who's already provided answers in a similar vein.

Marilyn Cade: Uh-huh.

Well, you know, I'm going to ask a different question.

There's no, you know, there maybe some companies who are interested in single letters but it isn't necessarily ICANN that's interested in single letters. While the broad communities have endorsed the importance of IDNs, do you...

Mark McFadden: But, I don't put that changes the character of the technical question.
I think what you're driving at are more policy issues than that.

Marilyn Cade: Okay. Okay.

Greg Shatan: Oh this is Greg.

It doesn't sound -- just to wrap up before. It didn't sound like there was a technical question with single letters at the second level, so long as there are no single letters at the first level.

Marilyn Cade: Right that is what I've captured.

Greg Shatan: Right.

Marilyn Cade: And so the questions are -- and let me just verify this with Mark, and I don't know if Steve (is gone now). So the question...

Steve Bellovin: I'm actually able to give a few more minutes than I thought.

Marilyn Cade: Okay.

Greg Shatan: Thank you.

Marilyn Cade: So the questions are, single letters and singleletter.singleletter, but we are not going to pursue numbers at all at - right, we're going to accept that answer?

Can I just verify that?

((Crosstalk))

So numbers.numbers. We're not...

Man: I guess I think if people are - if people are going to be testing a single letter TLDs, why wouldn't they just test a couple of single number TLDs at the same time and look at those results.

(Greg Shatan: I think again the issue is, if we accept no single - no numbers at the first level that numbers at the second I guess was - their technical question was two numbers at the second level assuming.

Marilyn Cade: No. No.

((Crosstalk))

Marilyn Cade: That according to my notes there's not.

Greg Shatan: Right.

Marilyn Cade: But I was just trying to verify, you know, and I want to stay away from - I personally am not really interested in wish list, I'm trying to understand what's really practical and needed to do. And so I'm just trying to capture this.

Singleletter.singleletter, Mark and Steve, we kind of said okay, there could be an "(Autonomica) type test", maybe someone else but (Autonomica) type testing. Are we also suggesting...

Mark McFadden: Well no, no. We said - I said that there might be an RFC1535 search order question with that.

Marilyn Cade: Right. Right. And that's right. Important. Thank you.

Mark McFadden: Marilyn, while we're talking, I went to (Linux Regime) and found that I was right about the ambiguity about the digits at the top level if I'm paying 127.1 as far as this is an IP address.

Marilyn Cade: Uh-huh.

Mark McFadden: That's Linux.

Marilyn Cade: So this is sounding to me like we have to do more work on what our questions would be. Steve has identified there maybe RFC1535 search order type questions and we identify ambiguity and digits at the top level.

So where does that leave us on what we might pursue and be - we aren't going to pursue number.number for further testing but we want to pursue singleletter.singleletter for further testing, is that a recommendation?

I'm just trying to capture this.

Would you want me to kind of toss up a couple of options and people chew on it by email?

Greg Shatan: I think that might be the better idea, Marilyn. I think the - I think that would be the best idea.

Marilyn Cade: Okay.

So I'm going to do a few options and people are going to understand that I'm just capturing - trying to capture this to my ref notes and then they will make comments themselves. And I'll add - I'll add Steve and Mark to the email string on the copy list, okay?

Man: Sounds good.

Marilyn Cade: Okay.

Greg Shatan: Thanks very much Mark and Steve. We really appreciate it.

Man: No problem.

Avri Doria: Yes thank you.

Man: Thank you.

Man: Thank you.

Steve Bellovin: Thank you for coming today. It's time Mark had (unintelligible) open for us a short supply these days.

Marilyn Cade: Thank you Steve.

Greg Shatan: I'm glad we can accommodate everybody and I think that does bring us to the end of today's call.

We do have our cal tomorrow.

Marilyn Cade: It does. But I'm going to try to really work on this tonight. And - so that you something to report on them, I'm going to try to have draft recommendations for people to look at tomorrow morning.

Greg Shatan: Yes, if we could look at those tomorrow morning and then on our call for this subgroup tomorrow afternoon, we can discuss those and other things.

Marilyn Cade: And we have a subgroup for our call tomorrow afternoon. Then we have a...

Greg Shatan: Full working group call on Wednesday.

Marilyn Cade: Right. Thanks. You know, we'll be done by Wednesday.

Man: Okay.

Marilyn Cade: I suppose we'll just be really done.

Greg Shatan: Yes. We'll be well-done by Wednesday.

Well thank you to our technical experts and thank you to the subcommittee.

Man: See you on the net.

Bye-Bye.

Marilyn Cade: Thanks.

Greg Shatan: Goodbye all.

Man: Bye-Bye.

Marilyn Cade: Greg - thanks very much Greg for making this happen so quickly. I think we're making some progress.

Greg Shatan: My pleasure. I'm absolutely glad that we're making good progress.

Marilyn Cade: Patrick, thanks again for all your help and your previous research which we keep tending to turn to I think.

Patrick Jones: No problem.

Marilyn Cade: Bye everyone.

Man: Bye.

Greg Shatan: Bye everyone.

END