

IP Telephony without the Migration Migraines

IS THE GRASS REALLY GREENER?

VALERIE ST JOHN: And welcome to TechWiseTV. I'm Valerie St John along with Cisco Solutions experts, Robb Boyd and Jimmy Ray Purser. And as you can see, the estrogen level has become much better calibrated today because we're also joined by Tina Shakour --

JIMMY RAY PURSER: Here comes.

VALERIE ST JOHN: Yes, Tina has been an engineer, she's been a CCIE, and she supervised more than 50 IP telephony implementations since 2001, you've been busy, and she's got a lot of opinions on the topic as you can imagine. Welcome, Tina.

TINA SHAKOUR: Thank you, Valerie, it's a pleasure.

VALERIE ST JOHN: So I understand that in the field, your handle is actually Voice Chick, which apparently not everybody can use because you're actually one of the first women in the US who's been Voice CCIE certified, right?

TINA SHAKOUR: That is correct, back in the day.

ROBB BOYD: That's not shabby.

VALERIE ST JOHN: Well it's an honor to have you as my guest.

TINA SHAKOUR: Thank you.

JIMMY RAY PURSER: Okay.

VALERIE ST JOHN: Our focus today is IP telephony, Migration Without the Migraines, and we're going to look at the how and the why of the transition from a PBX system to IP telephony. Now Cisco's been in the IP tel business for more than a decade, but to many it's still kind of a new technology, and Robb we need a good dose of the fundamentals here. Of course, making that change is a pretty significant investment. Why should a company consider it compelling?

ROBB BOYD: Well these days it's more of, it's not just a matter of if, but it's when. You know, at some point, I mean the technology has certainly been proven. It's been deployed, it's working. Tina, you obviously are testament to that with your career based around this. And the idea is that people can do this, but I think, in a down economy, it's not that you stop making changes that benefit your business, you just may adjust the metrics by which you measure that. But how would you say? I mean do you think, are people still making these investments and why would you say?

TINA SHAKOUR: They're absolutely making these investments, and what you're seeing is that the industry has clearly spoken and said that PBX technology is not where they're developing new features, new functionality or new operations. So the industry has made the change to IP telephony, and it's just a matter of really when will your company do it.

ROBB BOYD: So playing a little bit of a skeptic here, I think, as a company looks at it and they go, I've got a perfectly good working PBX. It does the things I need it to do. There's not probably a good reason for them to change if things are working the way they're supposed to. So we're still looking for some of these key indicators that if you're opening new offices, if you're expanding, if you're still wrapping your business perhaps around the technology versus having the technology support your business needs, right? So flexibility is obviously hindered. I would assume some of those same metrics are still measured in there. What would you say are the basics people are saying, you know what, at a minimum, if I start moving things, I can't sacrifice X. What would those kind of things be?

TINA SHAKOUR: Absolutely, reliability is the first thing that comes to mess people's minds.

ROBB BOYD: Make sure it's always available? Yes.

TINA SHAKOUR: Always up, always available, and features. That's critical. You absolutely have to understand what features are needed and used by your company.

ROBB BOYD: And are we moving to a point now, I mean people would often think of IP telephony as not being as reliable because they're like, oh my gosh, I remember 10, 15 years ago, the data network going up or down could be a regular

IP Telephony without the Migration Migraines

occurrence. Now it's something I don't think any of us can really even imagine much anymore. So I know that's not all there is to it, but obviously that's an element I don't think people need to worry about as much. What about serviceability and implementing these features in an easy to use manner? Those kind of things continue to weigh in?

TINA SHAKOUR: Absolutely, and one of the biggest changes that a company can get is just consolidating the networks. This is something we've been talking about for a long time, but the reality of it is still there. You have the same security practices around one network versus having security practices around two networks. And provide more flexibility. It's still a very important factor, and it's something that I think a lot of people overlook.

ROBB BOYD: Well I know PBXs are known for having a long list of features, some of which are not even used. I mean they just get --

TINA SHAKOUR: I know.

ROBB BOYD: Obviously, the telephone numbers sit around for a very long time, and every time someone requested something, I think it became very easy to just add stuff on, but there's still a core list of things. I think one of the early criticisms of IP telephony moving over to it was the sacrifice the feature and functionality. You reminded me of one earlier. I'll let you go ahead and say it, but what was that one thing that we missed for a period of time but its ancient history at this point?

TINA SHAKOUR: Do not disturb.

ROBB BOYD: Yes, how did we miss that one? I don't want the developers getting angry at us here on the show, but the ideas, I mean, do not disturb, you got caller name ID, all these things that we've come to depend on as far as building our business, those things are still there. I see Jimmy Ray is itching to get involved in the conversation over in the lab, so we probably need to go join him in a second.

ROBB BOYD: Jimmy, what do you consider to be the first steps in terms of how we start moving over to IP telephony?

JIMMY RAY PURSER: Well, I tell you, any type of telephony deployment that I've done, I think the first step was probably find out where the liquor store is because you probably going to need it.

ROBB BOYD: Yes.

JIMMY RAY PURSER: It's going to be a pain in the tail.

TINA SHAKOUR: A good bottle of vodka, yes.

JIMMY RAY PURSER: Just poking at Tina because I love --

ROBB BOYD: Before we get into Tina's kit, does she think she should have prepared a little bit later but I think of phased migrations and things of that nature are, What kind of phases do you start with --

JIMMY RAY PURSER: Well.

ROBB BOYD: Because I think people are scared of the big cut that goes, now you're here, now you're there. A lot of pain but it's potentially in between. It's not like that, is it?

JIMMY RAY PURSER: Well there are a couple things that you want to look at when you're doing the migration. There's a phase approach and there's a parallel approach. And I don't know which one you prefer the best. I mean I've been through both, and the phase approach is we're kind of slowly working this gear in, and we're looking at, so will you take a look at the white board here. If I'm looking at actually, I've got a building here, this is how we did the cut over here at Cisco. We went from PBXs to voice. We did it a building at a time. Every weekend, they cut a building over, and so what they did was is that you've got your PBX that's inside this building that's connecting out to the PSTN, and then inside of that, you have what is a, it's a little PBX right here. And then you've got your voice system here that we're wanting to cut over here, so I just put a big V on this one. It's the one thing that we're looking at here is that as they did this cut over, this phase cut over here, is that you still ran the PBX, but you put in steering codes and you put your extensions in here, and then you deleted them from here, and you had added steering codes so that when a call came in they got steered to this new IP PBX type of solution, and you can kind of move these over. There's a little bit less stress, well, I don't know if less stress I would say. It's probably a bit more stress because you're

IP Telephony without the Migration Migraines

cutting in, you're slowly kind of working this stuff off, and that's a phase approach.

TINA SHAKOUR: Right, and these could be remote branches. These could be buildings.

JIMMY RAY PURSER: Yes.

ROBB BOYD: But they don't have to physically be within a campus or anything like that?

TINA SHAKOUR: Right, right.

ROBB BOYD: Okay.

TINA SHAKOUR: This could be -- you see this happen with like branch offices. They'll get cut over early, and then everything will start to be brought back into the headquarters so that you get centralized control.

ROBB BOYD: So what are the options for coexistence? We're in a phased approach here. I assume the two can coexist, but there are probably some technical considerations we need to be thinking of there?

TINA SHAKOUR: Absolutely, a phased migration is going to be really important to most customers.

JIMMY RAY PURSER: You guys got the most viable of doing this, most folks would be doing phased instead of phones.

TINA SHAKOUR: Absolutely, yes. The problem is this cutting over 10,000 phones just from a scalability issue all at once is challenging. You got to train your user.

JIMMY RAY PURSER: Oh, don't shout it out.

TINA SHAKOUR: You got to get it out right? So what you see happen is you got your PSTN connection coming into the building or wherever you're doing your migration. It's connected to the PBX, and you bring up your IP system, and there's two ways that you can look at this. You can leave the PBX as is with all of the connections to the PSTN and then connect the PBX to the IP system either using a PRI, QSIG, or SIP.

ROBB BOYD: And the reason why you're doing this, right, is you want this to be, I mean ideally in the transition period, you want it to be transparent to users that are on an old system calling someone on a new system or vice versa, obviously are not going to --

TINA SHAKOUR: Exactly.

ROBB BOYD: Adopt new dialing patterns just for that transition.

TINA SHAKOUR: Right, and --

JIMMY RAY PURSER: It's even more than that, too, because one of the things that, well everyone of these vendors, every PBX vendor out there has their own proprietary signaling protocol to actually work with their devices. All of them. That's just kind of part of it. You know I'm sure you've heard nightmare stories, have you ever worked with ABC protocol?

TINA SHAKOUR: Can't say that I have, thank goodness.

JIMMY RAY PURSER: That's a, yes, that's a --

ROBB BOYD: That's a protocol that's made up.

JIMMY RAY PURSER: That's a fresh protocol from a fresh PBX vendor, and you can fill in the blanks from there. One of the -- because the problem is we know we have all these companies acquiring other companies, but we have different regions that have different PBXs all over the place, and we still need to communicate with these devices. I have one PBX to talk to this PBX, their protocols won't interoperate so we created QSIG. And QSIG has a very defined feature set of the things that it supports on all the network. It's based on HTLC and LPD. So one of the things is we're kind of, it's like well show me a packet trace of QSIG. Well QSIG's embedded into it. It doesn't really have a header, you know what I mean? It's based on HTLC, so it doesn't like

IP Telephony without the Migration Migraines

transfer like that. It's just designed for feature functionality, but the problem is, with QSIG, is that a lot of these PBXs they weren't just put in yesterday. They're old.

TINA SHAKOUR: Yes.

JIMMY RAY PURSER: And they were put in after QSIG was developed. And so that means that I need to add some support and retrofit this thing to support QSIG which is that's not a cheap proposition. We're talking about, a customer I know who did this, they wanted I think 30,000 bucks to upgrade their PBX for 3 months. That just seemed like a waste of money.

TINA SHAKOUR: Yes, that actually is one of the challenges. As the older PBXs, like you were mentioning earlier, the features really didn't grow by leaps and bounds. So if folks upgrade their PBXs and if you have to upgrade processors to support the new software.

JIMMY RAY PURSER: Oh, yes, that's right.

TINA SHAKOUR: Plus the new software, you could be looking at a lot of money.

JIMMY RAY PURSER: That's true, I keep forgetting PBX upgrade path is a lot different than --

TINA SHAKOUR: Very, different.

JIMMY RAY PURSER: Than what we're used to here, because we're really talking about you've got the software package, you've got this CPU package, you've got a -- it's a lot different than I was ever used to. I was, what the heck.

TINA SHAKOUR: Yes.

ROBB BOYD: The thing, but --

TINA SHAKOUR: So what I was going to say is if you have QSIG functionality or SIP, which does a brand new, well, as new as a PBX can get that you've got sitting there, you're going to get the four digit dialing, the five digit dialing across systems, you're going to get caller ID, you're going to get caller name past, you're going to get those basic features. So it's going to be somewhat transparent to your users that this is going on. The folks on this, they're going to have to cool flashing of your thumbs though. But this is a pretty simple migration path. What eventually happens is the PBX goes away, and you'll open up a connection, you move the trunk lines over from the PBX to the IP system and everything's gone.

ROBB BOYD: And so that's completing the migration?

TINA SHAKOUR: That's completing the migration. Now, let's say you have a really ancient PBX or a key system that doesn't support, and I hate to --

ROBB BOYD: What's this reality? You went to smaller branch offices?

TINA SHAKOUR: It is a reality, and I will tell you --

JIMMY RAY PURSER: (inaudible) offices I saw out there.

TINA SHAKOUR: This has been a while. It was a very small company, but their system didn't even support PRI.

ROBB BOYD: Okay.

TINA SHAKOUR: So.

JIMMY RAY PURSER: Holy smokes!

TINA SHAKOUR: So what we actually did is we left the PBX there with its analog lines to the PSTN, and we brought up the IP system separately and moved the users over pretty quickly actually because the support just wasn't there on that old system.

ROBB BOYD: This was a very quick transition.

IP Telephony without the Migration Migraines

TINA SHAKOUR: It was a very quick transition, and it was a very good transition. And that PBX, that it couldn't even be upgraded. That is actually one of the things that you'll run into as vendors.

JIMMY RAY PURSER: Some of them are so holy, man, I mean really.

TINA SHAKOUR: And vendors have been acquired and moved around and end of support and getting the software, getting the PRI linecards.

ROBB BOYD: So that's one of the first lessons is assessing, Jimmy Ray's been off you know what I'm saying is, know thyself, but this idea of know what the capabilities are on your PBX so that will narrow down the options that you hopefully will have more than one option, but you may only have one option in terms of how you might actually face that migration yourself.

JIMMY RAY PURSER: Well you know, one of the thing too to take a look at when we're doing this is it just good IT practice to have a lot of good notes. I mean these PBXs are pretty notorious for recording everything. So I think that, it's not like I could go to a PBX and type in SHOW, RUN, COUGH, you know, and print that out just move on or show tag and get a good listen of what I have in here, maybe you can always -- tons of load points, just like load point 24, this (inaudible).

ROBB BOYD: Sounds like a true data guy, huh?

JIMMY RAY PURSER: Load point six for this, and it's really, it's also having that stuff because it really does make, configure up to gateways and stuff so much easier, I think, man to have all that stuff in record and even to have it is just part of your archive. Going to focus more, a lot of that stuff was configuration won't change. You just going to transfer right over.

TINA SHAKOUR: Right.

JIMMY RAY PURSER: Won't you agree?

TINA SHAKOUR: Now is not the time to be making changes like that too, right? If you've got calls being routed to a certain place or a certain extension, now is not the time to be changing that. You do not want to change your, where your call center's gone, who's answering who's extension. This is not the time to be changing that. It's not time to get creative.

JIMMY RAY PURSER: Hey let me ask you something, what's the biggest mistake you see people doing this stuff right now? I'll tell you what I see, you tell me what you think is the most common. Well the biggest mistakes I've seen people going from a PBX to an IP-based PBX is that that they leave off a lot of features. They feel like they're losing functionality, and so they don't configure a lot of stuff on there and you're taking away stuff from the users when they get these brand new phones that can actually give them more. They do them a whole lot less and say, well, we're streamlining, we're powering this stuff and so you're going to get a whole lot less features. And I personally think that's a pretty bad, we'll put our users back primitively, but that's what I see all the time.

ROBB BOYD: Unnecessarily.

JIMMY RAY PURSER: Unnecessarily, exactly. Well take a PBX functionality. What do you see?

TINA SHAKOUR: I would absolutely agree with you. And the people that I usually thought were the most critical to interview are the administrators to the executives.

JIMMY RAY PURSER: Oh, that is a really good call.

ROBB BOYD: You said they'd be the last or the first?

TINA SHAKOUR: The first. If you only talked to one user group, they're the ones because they're power users and they affect the way perception is seen, right? Our exec admins are incredibly powerful people. They're very good at.

ROBB BOYD: They're not shy about showing their opinions.

TINA SHAKOUR: No, they are not, and who are they sharing their opinions with?

IP Telephony without the Migration Migraines

ROBB BOYD: The executives, potentially, yes.

TINA SHAKOUR: The executives who, you know (inaudible) are in charge of your careers. They're the number one people that you should interview, and your operators.

VALERIE ST JOHN: Alright guys, that's enlightening stuff. I think I'm beginning to understand how this transition process is configured. The headache is sort of slowly receding, but breaking up is hard to do. Paul Simon had 50 ways to leave his lover. How many do we have? That's next.

BREAKING UP WITHOUT THE HEARTACHE AND HEADACHES

VALERIE STJOHN: Okay, I can accept that change may be necessary. I guess that options exist for making the switch, but how? Do I just slip out the back, Jack? Make a new plan, Stan? Use the old it's not you, it's me line, Robb? Know what I mean?

ROBB BOYD: You're going so well down that Paul Simon path. I kind of like that, but I appreciate your not breaking out into song although I'm sure that would've been great.

VALERIE ST JOHN: It was tempting.

ROBB BOYD: Actually, this make a lot of sense. And actually I have a list of migration prevention kit that Tina you were sharing with me earlier. Your top five items that you recommend someone always has on hand to kind of prevent the headache, if you will, we've been kind of talking about in making this migration. The first thing you have on your list was to obtain the DNIS digits, the Dialed Number Identification Service, is that?

TINA SHAKOUR: Correct.

ROBB BOYD: Well just tell us about why we need that.

TINA SHAKOUR: Basically what you're going to want to do is know all the numbers coming into your PBX.

ROBB BOYD: Sounds simple.

TINA SHAKOUR: And you may be surprised what's sitting there, alright? All those fax lines that got added in the '80s, they're probably still sitting there. There are extensions for people who haven't worked there for five, ten years probably sitting in there. There are lines that nobody knows what they're for, and there's probably some 800 numbers that are still sitting there that nobody knows what they're for. So there's two important factors here. One is a good time to find out what you really need and cut some costs immediately by getting rid of all those unnecessary lines, but also really know what's coming in and what it's for.

ROBB BOYD: Is it because people are really good adding lines but never kind of taking them away, and so they creep up on you and you got so much hair on the organization, so to speak that you don't really know what's there, and these ideas that's a potential disastrous point during the migration because then it will become dramatically obvious that you forgot about some few things?

TINA SHAKOUR: Exactly, and people are very good at adding things. And there's something about a phone audit that we just don't like.

ROBB BOYD: Yes, and that sounds like it's been avoided, obviously, if you have to do this just because of the migration.

TINA SHAKOUR: Yes.

ROBB BOYD: Alright, number two on your list was to print out the terminal number block. What is that?

TINA SHAKOUR: So you need to know all the extensions that are in the PBX. So first you need to know the phone numbers that are coming in.

ROBB BOYD: So that's the external stuff? Okay.

IP Telephony without the Migration Migraines

TINA SHAKOUR: Then you need to know the internal extensions that are there and who they're going to. Are there people covering extensions for other people like those executive assistants that we're talking about earlier? The operator, are there phantom extensions used for whatever reason within the organization? You really got to know what's in there and what it's being used for. Now is probably not the time to be deleting your extensions in a PBX or as you move to an IP system. If you're not sure, carry it over. It doesn't cost you anything.

ROBB BOYD: In my day, I'd run a Nortel Meridian for a period of time and that was the -- I know. Well you know I learned a lot of things at the time. It was a great lesson many, many years ago. But the idea was that was the way you found out who your users were. You just removed a line off the punch down block or maybe you'd delete it out of the extension to be sure --

TINA SHAKOUR: Make you very popular too.

ROBB BOYD: And that was the way, then I knew, oh what is your name again? You get the correct spelling and we could add it into their caller ID, so to speak, whether we call it there or not.

TINA SHAKOUR: Problem is when you shift to IP, you do not want that to be the time that their phone stops working --

ROBB BOYD: There's no -- because what are they going to blame?

TINA SHAKOUR: They're going to blame the IP network.

ROBB BOYD: Right, blame what's new, right?

TINA SHAKOUR: Yes, and if you accidentally delete your CEO's extension, your career may be limited. Just a little.

ROBB BOYD: Okay, so add that one to the list, alright.

TINA SHAKOUR: Yes.

ROBB BOYD: I'll put that one down there as well. But number three you have is double check your protocols. What do you mean by that?

TINA SHAKOUR: Well, as we were talking earlier with Jimmy Ray, if your system does not support the newer protocols, and that's kind of funny to call QSIG a newer protocol, but if your system does not support QSIG or SIP, you need to know that upfront because you need to build the cost in to either upgrade the PBX or understand your limitations as you do the migration.

ROBB BOYD: Are there other protocols you need to worry about in this either transition process or things are going to need be supported afterwards?

TINA SHAKOUR: Well, you might be surprised whether your PBX actually supports IP at all. You may want to check and see if it has an Ethernet connection, right? So there's some other things there, but you need to understand what's there, and as you go through the design with your engineers, know the limitations of the system and what protocols are supported and what it would take to get to what you want, I mean if it's worth it.

ROBB BOYD: Okay, and this is one I didn't understand. You said to consult the customer database for call flow. Is customer database a formal term or is that just a term for, like, your internal stakeholders within the company and you're calling, like, customer database or is that a PBX term that PBX people like, Robb.

TINA SHAKOUR: Well every PBX probably calls it something different, but what you want to be doing there is making sure that you know who's handling what calls.

ROBB BOYD: Okay.

TINA SHAKOUR: Alright, and I think we talked about this earlier is you need to know if an admin is covering five different executives and where calls are going. If you have a front desk attendant or an 800 number that comes in as a main line to your phone, to your company, you need to know who's handling that and --

ROBB BOYD: Which means there's some routing rules or something like that in terms of if there's a database tip that's occurring

IP Telephony without the Migration Migraines

somewhere in there, You are going to have to document that? Your final one on your list was your must have reports. You have a kind of list of reports here like these are the ones, I mean those you mentioned obviously were a few reports. What else?

TINA SHAKOUR: The most important list that I can think of, most important report is the features that are being used. And we talked earlier about the executive admins, the call center, the incoming numbers.

ROBB BOYD: Yes, just like a feature capable list. It's a feature that's actually used less.

TINA SHAKOUR: That are being used, absolutely. And you will occasionally find the craziest feature in the world being used in a way that you never thought it was going to be used, but boy you better make sure you can replicate that feature for them.

ROBB BOYD: Yes, because it will be that one user who will be your noisiest person that goes, you know what, this is why we use that system. Why'd you change it from me?

TINA SHAKOUR: Exactly. He usually ends up being my boss.

ROBB BOYD: Yes, that's the way it always works out. We mentioned also, like, config reports, route block, things of that nature. Those are things we need to get, we can get that out of the PBX as well.

JIMMY RAY PURSER: Yes, let me ask you this one, because this is the thing, I mean it's pretty easy for us to say pull out this record and pull out that record and stuff because from a data point, we kind of understand how to print. We understand how to print from, like, we understand how to print from Windows, we understand how to print from Mac. Printing is something that's relatively, I think, we take for granted and stuff, but why these PBXs? Some of these commands are incredibly cryptic, I mean, in a very proprietary and it's hard to understand, some people may call the trunk, some people may call it a foreline. There's a lot of different things I've seen user, of course trunk is almost always (inaudible) but you never know. But route block, I've seen a lot of different names for route block and stuff out there. Are there any migration guides? Because I'm sure there's vendors that go and say, oh you're leaving us? Here let's help you get over to a Cisco solution, whatever.

TINA SHAKOUR: Right.

JIMMY RAY PURSER: Do we call in a specialist at PBX to help us migrate? Are there guides that we have? Because this was always the biggest hang-up on doing these cutovers, it's understanding that that dadgum PBX. It's like I'd get all other stuff then I got to give them a message I think and I have not been trained on it. I don't know and I don't have a clue.

TINA SHAKOUR: No, I know exactly what you mean. And fortunately, here at Cisco, we have a great interoperability lab. And they document everything on the PBX side and on the Cisco side. Screen shot, line by line, how to do the migration, how to gather information, how to make the changes.

JIMMY RAY PURSER: And that's external level documentation?

TINA SHAKOUR: Absolutely.

JIMMY RAY PURSER: I saw the Nortel and it was really good.

TINA SHAKOUR: Yes, and primarily I think there's a, probably the top five vendors that we see integrated with are there and we did all the testing.

ROBB BOYD: We have links to that on the show notes. We'll have that on there.

TINA SHAKOUR: Absolutely.

ROBB BOYD: Also your migration prevention kit, I'll make sure that's on the show notes as well.

TINA SHAKOUR: Alright.

ROBB BOYD: So people can get to that quickly. One of the things I'm concerned about, and this gets back into kind of some network foundational roots, but it's the gateway functionality. A lot of things we've talked about here with the exception of incoming numbers and things of that nature, it's getting to the outside with our system as well. When we're talking about this

IP Telephony without the Migration Migraines

kind of thing, what do we need to understand from gateway perspectives?

JIMMY RAY PURSER: Well, we're back to sizing this stuff out. I mean I think that anytime I ever did the cutover, the visual record I try to get first. Here's a PBX sign there, it's got part numbers and names and all those stuff, why was that one the one that was spec'd out and picked? Can I find out the limits that that thing takes? How many users it supports concurrently? What is this, how do they have that configured to support their current environment? And then look at what do I need to do on my gateway to size it for us, you know.

ROBB BOYD: Right.

JIMMY RAY PURSER: Of course I run all my underlying measurements and all that stuff. And make sure that I get all my time (inaudible) to size, my trunks out and all that but my gateways, I'm looking at a couple of things here. I'm looking at my analog gateways and my digital gateways. I mean that's typically about all there is to do it, and it's amazing how much analog is actually on a network. I mean it's incredible how much stuff is on there, how much do I need to configure a modem pass through for fax machines, for people that have routers connected to modems so we can access some remotely at two o'clock in the morning. And there's a lot, lot, lot of analog I need to configure on there. And more than anything, when it comes to the size of that gateway, I think I'm a bit more on the analog side than I ever was on the digital side. So one of the first things that I do, when helping folks in there, I go out and use an analog modem hunter like WarVOX, great tool, HD Moore wrote it, and you can find it on his site. He's the guy who wrote MetaSploit.

ROBB BOYD: We'll link to it.

JIMMY RAY PURSER: And, but it's a great tool for actually, in fact way back when, we used to do war dialing with, like, THC and ToneLok. I mean those are really good war drivers. A lot of people don't do it anymore because this is incredibly illegal to do that stuff on if it was not your network. I mean if you do that, there is a telecommunications act, I don't remember what it was, but it was actually wrote to protect consumers from actually, what they used to call dialing for tone. But on a migration, I need to dial for tone. I need to look in my PBX to see what extensions I've been granted and then put that on. And I need to dial for tone and find out what everything I have. And then anything that comes up with analog hit, then that's where I'm actually looking at why I need FSX, FXO, more FSX and then oh of course, and size that in. And then I go to digital and start sizing up all my digital stuff and plugging that in because my gateways, simply speaking, what I'm looking at with my gateway here, my gateway is basically a disparate router. It's connecting an IP system to a PSTN or whatever system out here. A non-IP system is really what it amounts to that it's connecting up. And in that feed, I've got my digital feed and then I've got my analog feed, and at that point that's how I size and build this stuff up. Do you have a rule of thumb? Kind of worried because I'm not really good at this, I've kind of always considered that what analog is there is probably going to stay. It's not going to grow. Do you ever size anything as a rule of thumb, like a 20% rule or anything like that because if it's there, that's what there and it's probably never would change?

TINA SHAKOUR: Yes. I don't think there's a hard and fast rule that you can use with that. But as we were mentioning earlier, I think that, really, people do need to double check that analog because you don't want to invest in analog technology that's going to be over IP or, like you were saying, modem relay over IP if you don't need it. And a lot of times, there's a lot of analog lines sitting around doing nothing.

ROBB BOYD: Well how the analog lines are brought in directly procured by the users, didn't go through the voice department and that type of things.

TINA SHAKOUR: I've seen that happen, yes.

ROBB BOYD: So you, one, you may not even have the record. That's the record you've got to get from your service provider, right? Even though those lines potentially are coming in --

TINA SHAKOUR: They should be able to tell you that.

ROBB BOYD: Because what you're talking about is by getting a busy measurement, you're saying we don't need to procure a one-to-one ratio of analog devices to analog ports that would be handed off from the gateway which would be a router on our case, right? You're saying there's a certain number of them that could be used in any given moment. We can go with a safe measurement and you're saying it obviously varies depending on what people's loads going to be so you could measure for that.

IP Telephony without the Migration Migraines

JIMMY RAY PURSER: I put it pretty low, and it's amazing how many folks I see their using, I mean look at every PC out there they has a built in modem port. And how many folks I see will plug that in to an analog line so that they can access their files when they go home.

ROBB BOYD: People do that still?

JIMMY RAY PURSER: All the time.

TINA SHAKOUR: It's actually a big security challenge there.

JIMMY RAY PURSER: That's a humongous security challenge.

TINA SHAKOUR: It's a big security challenge.

ROBB BOYD: Yes I know, absolutely.

JIMMY RAY PURSER: You know what's funny about voice that really kind of gets me going is that all these old blue boxing techniques that we did way back in the '70s, early '80s and stuff are coming back, reported to IP and they're -- the hassle is a lot of those skills are gone. A lot of people that do those skills, they just don't do computing anymore. They've moved into management, they did stuff, and so a lot of these old school skills are kind of not being used except by a very few small amount of hackers out there, and they figure out where to exploit these systems and people just don't even know it man.

ROBB BOYD: Well people don't --

JIMMY RAY PURSER: I mean I was breaking into some of the '50s systems that Tina installed.

ROBB BOYD: We knew you couldn't stay away--

TINA SHAKOUR: You won't get into my systems.

ROBB BOYD: We knew you couldn't stay away from security alarms (inaudible) you got those notes sticking around out there, people don't touch those PBXs for a while. Those are great backdoors into this. Reconfigure those systems, you got a little --

TINA SHAKOUR: Absolutely.

JIMMY RAY PURSER: If I can backchannel and get through here and figure out a way to actually get that to start passing my traffic, dude I've really got a very nice sellable security hack out there. I can have, I can resell that service man big time.

TINA SHAKOUR: There's always there --

VALERIE ST JOHN: We love those Jimmy Ray hacking references. Alright, guys, excellent fundamentals. Thank you very much. We have our kit, we are armed, and of course you can access these details with links and more from Tina on the show notes located on our blog. So we want to route you there as well. By the way, this is going really well today. It's about time we added more girl power to our lineup, right? Got to stick together. What's that?

ROBB BOYD: Like it's getting better all of a sudden.

VALERIE ST JOHN: Of course it's getting better.

ROBB BOYD: Come on, it's nice to have her but let's not oversell it. Okay, okay.

VALERIE ST JOHN: Stop it, stop it. Accept, embrace, Robb, embrace.

ROBB BOYD: Whatever.

VALERIE ST JOHN: Okay, I love the how, but I think we need some more why. So join us next for a gulp of SIP.

IP Telephony without the Migration Migraines

SIP, DONUNDEFINEDT GULP: PROTOCOLS VERSUS PROMISES

VALERIE STJOHN: Online, on demand and on the go. This is TechWiseTV. Technology you can use from geeks you can trust. So we've talked about the transitional basics and we'd like to spend a little and look at the bigger promises of IP that's not always possible with a TDM-based system.

ROBB BOYD: Well it's not always possible in the PBX. Some have them if you've got newer ones and things of this nature, but I think one of the most exciting things you teased us earlier was what can be done with SIP or Session Initiation Protocol. And you've talked about this a little bit coming up as it's a way to tie in trunks and some other things of that nature, but we hear SIP is kind of gets thrown around as the answer for everything these days, from a protocol for connecting phones to supporting features people didn't even know that they wanted. But it seems to be that SIP trunking is probably the most abused terminology in terms of answering a lot of problems that may or may not always be the case in every situation. So I thought it would be healthy for us to kind of expose some of the realities if you will of what is SIP trunking, what are the things we need to be aware of, what can we take advantage of versus what should we stay away from.

TINA SHAKOUR: Alright, so you have.

ROBB BOYD: Let's do all that if you don't mind.

TINA SHAKOUR: We're going to get on all of that.

JIMMY RAY PURSER: Bring it on.

TINA SHAKOUR: There's actually three things that are considered, that work with SIP.

ROBB BOYD: Three things, okay.

TINA SHAKOUR: Three things. We're only going to talk about one of them.

ROBB BOYD: Oh, one? Got it.

TINA SHAKOUR: Alright?

ROBB BOYD: Good.

TINA SHAKOUR: But just to be clear.

TINA SHAKOUR: Yes.

ROBB BOYD: Good tease.

TINA SHAKOUR: But just to be clear so people know what we're talking about, there's SIP line side which is connecting phones via SIP. That's an open standards feature functionality discussion.

ROBB BOYD: Line side equals phones, okay.

TINA SHAKOUR: Two PBXs connected together through SIP which we talked about that.

JIMMY RAY PURSER: Yes.

TINA SHAKOUR: If you have an updated system, you could connect the PBX and an IP system through SIP.

ROBB BOYD: Okay.

TINA SHAKOUR: But the one that's really got the groundswell right now is the carrier side SIP. So that connection from the PSTN that we were talking about earlier, that old connection that currently is a physical PRI connection, 23 channels, 23 calls that's all you get, imagine that being SIP-based, IP-based and then only limited by bandwidth and what features your carriers out that.

IP Telephony without the Migration Migraines

ROBB BOYD: And I tested this out on you guys earlier because you're a lot smarter than me on these subjects but it had dawned on me when I was researching for this show and stuff, and it had become abundantly clear that as we talked about the fact that people advancing the networks, they're upgrading from PBXs into a fully digital IP-based world, well obviously carriers have been doing the same thing on their side as well. They've got very updated networks and things of things of this nature. And what dawned on me is when you were talking about SIP is that we actually referred to some very old protocols. We dropped to this least common denominator thing, we got two advanced intelligent networks communicating through two cans and a string all of a sudden --

TINA SHAKOUR: Just about.

ROBB BOYD: And you're like, wait a minute, why do we have to drop to these low standards just to connect two very advanced networks? There's a better way to do it, but there's some realities to it as well. I like that notion of understanding the problem with the trunking side of that as well on the carrier side. So how does that work and what do we need to be scared of or what about.

JIMMY RAY PURSER: Here's what I would say. If you told me that in the conference room, my first thing I will say to you is, ok well how about this?

ROBB BOYD: Oh, QoS? How does that get carried across?

JIMMY RAY PURSER: That'll be my concern because when I'm connected to a PSTN, I'm not worried about QoS because I have a dedicated circuit and it's locked in. And see, I really consider myself a kind of an anti-voice guy.

ROBB BOYD: Really.

JIMMY RAY PURSER: I know it's hard to believe that.

TINA SHAKOUR: I noticed.

ROBB BOYD: You've never revealed that side of yourself.

JIMMY RAY PURSER: But it's hard to see it because if you come in to sell me voice, you're trying to tell me that you want to come off a hundred year old proven network. Of course all the PBXs are still (inaudible) 100 year old, right? But you want to come off a proven network where I've got 911 servers. So I've got a separate power source or I've got a PBX that doesn't go down, it doesn't get a virus attack. Always thinking you tell me you will go off that to Ethernet which I know all the problems solution. I'm the security guy man you know? And I've got all these other factors going here and what, man you know what? I hear what you're saying but you're still not telling me something better because I mean let's get real. If I'm looking at reducing cost, that's not a good answer today in my opinion because the toll charges are so minuscule right now that it doesn't really save me any money, to -- it costs me a lot of money to put a voice over IP system in. And I've always argued that, I'm sorry but it's just not, there's no money that can be saved that by being (inaudible) for yourself that can actually offset without a ten-year payback plan what this can do. But then we're talking SIP trunking, now we're kind of changed you know it's like oh wait a minute, so now I can completely get rid of some of these dedicated lines and stuff.

ROBB BOYD: You're starting to depress me. I don't know if you have a --

JIMMY RAY PURSER: No, it is kind of depressing because I have seen all this stuff and I've seen them get all excited about this cool collaboration stuff, I'm like, okay, whatever. I mean do I really also need to dial from Outlook? Come on, really? I mean honestly?

TINA SHAKOUR: Yes.

JIMMY RAY PURSER: Do I really need to do that idea.

TINA SHAKOUR: Yes.

ROBB BOYD: I kind of like that actually.

IP Telephony without the Migration Migraines

TINA SHAKOUR: Kind of do, yes.

JIMMY RAY PURSER: It does about (inaudible) me.

TINA SHAKOUR: Quality of service is really important, though. And what's going to be interesting is you're looking at your PBX and the PSTN today, right? There's already got to be some quality of service going on in this network.

JIMMY RAY PURSER: Yes, right.

TINA SHAKOUR: They've upgraded to their networks. So if you've got a connection that's a PRI, if they are able to guarantee you the similar level of quality service with a SIP trunk, and better features and functionality, and all of a sudden you don't have to pay for 26 line cards or 26 PRIs in this PBX or this IP system, right? Customers are seeing the advantage. I'm kind of with you I'm not sure that it's that compelling right now. There's definitely a groundswell, people are going nuts over SIP carrier side right now.

JIMMY RAY PURSER: It is absolutely going crazy about the stuff.

TINA SHAKOUR: But I tend to see some of the more niche partners and carriers carrying it today, and we'll see where it goes. I think it's a very interesting discussion to have, and to start talking to your carriers about it. And absolutely, quality of service, how can they guarantee that that's going to be as reliable as the PRI that you've been using? What are they doing over here to make sure that it's up all the time?

JIMMY RAY PURSER: So if I'm looking at, so you're my SE and that would be cool.

TINA SHAKOUR: That would be weird.

ROBB BOYD: How come we never have an SE like Tina? The gods must be crazy.

TINA SHAKOUR: Being your SE would just be not right. Jimmy Ray.

JIMMY RAY PURSER: If I'm looking to get off my PBX, I mean that's what we're talking about in this show, and I'm looking at all this stuff in here, am I taking an honest hard look at SIP? Should I be looking at SIP trunking, honestly and say look, this is really a good solution? It's pretty big, it's pretty solid. Or I'm saying, well you know what, let's stay back on dedicated lines and then roll to this in the future. What would you recommend?

TINA SHAKOUR: I said earlier, and I repeat it again, when you make the migration, that is not the time to really shake things up, right? You don't want to be really changing a lot of things.

ROBB BOYD: So this would be further down the phase?

TINA SHAKOUR: It would be phase two, right? I would certainly evaluate it as you're going through the process. Maybe set up a SIP trunk and start playing with it, kind of you know how you were doing the two phones on this? Well maybe have two trunk lines, the PRI and a SIP that are going into a lab and test them and see.

ROBB BOYD: Well let's talk about how we do this. Because what are the parts and pieces required? What do you need to have in place? What kind of questions do you need to ask Jimmy Ray at them. I don't know if you want to kind of draw (inaudible). I understand it better when you get graphical on me.

JIMMY RAY PURSER: Kind of put me up, like me going to put my money where my mouth is. You mentioned earlier that there are two pieces to this solution here. There's the SIP phones and there's SIP servers. And really what we're looking at doing this, we really have to look at these two components separately because they do offer it separately. They do have different security concerns, they do have different entry points, they do have different configuration options, and they handle traffic a lot differently. So I don't like to group like I group TCP-IP devices in a category. You know I group UDP devices in a category. When it comes to SIP, I think that those, to me, are broke down phones versus servers.

TINA SHAKOUR: Absolutely.

JIMMY RAY PURSER: Because they are really different, you know? A lot of people like SIP because it's interoperable. I've got

IP Telephony without the Migration Migraines

good interoperability, you know. We can talk about QSIG, well hey, QSIG, well I got interoperability. Yes, but it sucks. SIP doesn't suck. SIP is really cool. Its very proven. There's a lot of really good features and add ons and package that make SIP incredibly strong and really integrated into our applications that really make an IP solution the strongest point out there today. I mean before we were doing SIP we were doing an H.323, right? 225, and we're good. And, exactly, and we go.

ROBB BOYD: He mean to bring back some memories.

TINA SHAKOUR: Oh, my where's that vodka?

JIMMY RAY PURSER: But when you get us, you look at a SIP conversation, we got offers and invites, and the flow is pretty common. Man you look at HA there'll the SIP. You look at H.323 conversation, and guess what, it's at 27 setup states actually gets this stuff when signaling it.

TINA SHAKOUR: I think I've lost that from my memory.

JIMMY RAY PURSER: It's really rough, so one of the things that I like to tell folks, when you're setting this up is that to make sure that you have a good SIP proxy server on here to isolate this traffic because SIP is -- we've talked about this many times before. No need to rehash and stuff. Its plain language. It's written where I can troubleshoot, so troubleshoot those (inaudible).

ROBB BOYD: Humanly readable as you've said before.

JIMMY RAY PURSER: It is so easy man. That's the best part about SIP is that, if there's a problem I can troubleshoot easy, just like email. Naturally I was --while email and you know in HTTP. But you know, like, if I'm setting up my firewall here, if I've got my ASA in line and I've got my SIP server, my ASA actually has built into it a SIP proxy. SIP adds a few more complexities to the network because of my random port ranges that I have to open up. And so and if I'm using NAT over here as well, most of the time, NAT will not work because I have a dynamic port range. I mean you're looking at PAT, I need different SIP inspection protocols. So I need SIP ALGs or application level gateways, as people call them sometimes. And there's a lot of vendors out there that are selling SIP firewalls. That or based exclusively to handle a secure SIP traffic, and they work.

ROBB BOYD: Does it work? Sounds like a snake oil thing to me to a certain extent.

JIMMY RAY PURSER: You can enter that --

ROBB BOYD: Let's start buying firewalls per protocol now?

JIMMY RAY PURSER: You see, I don't like appliancing my network to death, overpricing it. The ASA is really pretty cool. I hate sounding like a Goober marketing commercial here, but it does have some really nice SIP inspection functionality built right into it. So very secure SIP functionality. Man I've spent hours breaking that, sending false messages, trying to redirect that stuff, and it's able to shunt all of that traffic off, and not counting the built in security features into the phones that are able to really redirect and control quite well right off the top of the phone number which is pretty cool. But passing as traffic through here, I can set up my SIP fix ups and pass that protocol through and inspect it both ways. I can use my paths so I get good firewall transversal. But one thing that folks need to look at when you are setting up SIP on the network, and no matter whose firewall you have, even when it's ours, the question you should ask then is what is my SIP transversal through that firewall? How can I pass myself to it, how's it going to get inspected? I'm not opening up my network. I'm not just saying okay so ports --

ROBB BOYD: And who are you asking this question?

JIMMY RAY PURSER: 1520 -- ask your vendor. And if it's Cisco, then that answer is pretty easy but you know I understand you don't see this as a thing that --

ROBB BOYD: But you're not passing it blindly, you're passing it with some inspection going on there as well to verify that at least the protocol is still a protocol we thought it was supposed to be.

JIMMY RAY PURSER: SIP is human readable, it's human writeable, which also means that hackers can insert -- I'm going to show you how to do that real quick, not in this one but a little bit later on, I'll make you wait. But it really is easy to hack and send those messages through. We have to have, and there are protection mechanisms in SIP that are actually verifying this stuff to make sure that it works okay. But we need to make sure we've got firewalls we're actually protecting ourselves out. Plus I want to make sure in my SIP trunk that I no matter who my provider is, because remember I'm connecting now straight to the

IP Telephony without the Migration Migraines

Internet, right? My SIP server here, my provider is out here in the cloud, in the internet. So I need to make sure that we're trading information and we know exactly where the SIP proxies are, what ours are so we can put this information, and we can prevent -- into our configuration so we can prevent spoofing on this network. And I also want to make sure that I'm supporting other features and ask them. Do they need a delay offer? Early offer messages? We can support that. We support in one direction, you support the opposite, the other direction.

ROBB BOYD: They secures your conversations?

JIMMY RAY PURSER: With your carrier, with your provider.

JIMMY RAY PURSER: We will say, okay, typical recommended coming from Call Manager you use a delayed offer. Delayed offer means that we're waiting for them to send us a SIP message that says what their capabilities are. So we don't assign media services to that trunk line and waste resources and stuff because that's always critical. Every resource is critical and any type of voice because there's a kind of sensitivity. And then we do early offer on our stuff if it's going from them to us. We actually set that up so we can monitor and make sure that we're receiving their capabilities or we're not assigning a whole bunch of capabilities to a line that really don't need to be there. But before I -- I know you got to wrap this up real quick but, one thing that I'm sure is that folks understand that DO and EO, your early offer and your delayed offer, are completely different than what's called early media. A lot of people confuse the early media. What this early media means is that your media is set up and waiting for that call to happen before this stuff goes on. This is not that. Even if you could read it, that would be one of them.

ROBB BOYD: If you could read this.

VALERIE ST JOHN: Thanks Jimmy Ray. Laid out everything for us. You guys have addressed all the key concerns. But despite all of that, oh about a million or so people are going to tell us we shouldn't make the switch. So what about the hacks, cracks, and whacks? That's segment four next.

HACKS, CRACKS, AND WHACKS: DEALING WITH NAYSAYERS

VALERIE ST JOHN: Okay, I said earlier that Cisco has been doing IP telephony for more than a decade Still, there are cynics and skeptics out there, Rob. How do we convince them?

ROBB BOYD: Well, we have one of our chief cynics here with us as well, Jimmy Ray, who just hasn't managed to get away from an either security conversations throughout the entire show. So now take the gloves off, dude. This is your chance. This is your segment. This is Hacks, Cracks, and Whacks, remember this one? It's the security or, probably more importantly, the insecurity that many people still claim to feel when it comes to IP telephony. Is that something we need to be worried about? What kind of things can you help us understand?

JIMMY RAY PURSER: Oh, yes. IP telephony is such a humongous way to hack a network today. It's really amazing and here's a lot of avenues for me to break into a network when it comes to --

ROBB BOYD: Alright, these are good selling points. Okay, so this is easy to hack, easy to break into. Is he helping at all?

TINA SHAKOUR: It's not saying that Legacy PBXs is certainly weren't secure, either.

JIMMY RAY PURSER: No, that's true. I mean you could take a butt kit and plug into it. And the truth is, like, voice over IPs are like wireless. I can make it the strongest point on my network. Well you just can't touch it. I mean I can build it up and encrypt it and restrict it and make it so tight, it's still usable. My end users don't see it's transparent to everybody but a hacker, and I can really make it secure, more so than you could ever make a PBX ever. There's no doubt about it.

ROBB BOYD: Tina has a good point. She's bringing up that misconception that we're always secure in the TDM-based world when in actuality that was always based on physical security, which is make sure you have a lock to the punch down blocks, and things that --

TINA SHAKOUR: Yes, they were still --

ROBB BOYD: All you got to do is punch down the trunks so you could listen to every conversation.

TINA SHAKOUR: There is still the toll fraud, there is still war dialing, there is still a lot of insecurity based in the old world PBX

IP Telephony without the Migration Migraines

systems. IP telephony definitely opens up a whole new world.

JIMMY RAY PURSER: Yes, let me show you something here. So take a look at this. Here's what people see when I'm looking at IP. I type in URL, network configuration Cisco and, hey look at all these IP phones on the internet right here.

ROBB BOYD: Are your Google hacked?

JIMMY RAY PURSER: I can connect you -- Google hacking them right now.

TINA SHAKOUR: That is one of the worst things that I've seen.

JIMMY RAY PURSER: So it goes up.

TINA SHAKOUR: People can put their systems outside of the firewall so that they can take their phones home --

JIMMY RAY PURSER: I can click on here, take a look.

TINA SHAKOUR: Plug them in and they get to their --

JIMMY RAY PURSER: Just look at this one here.

ROBB BOYD: But they're working, Tina. What's the matter with that?

JIMMY RAY PURSER: You take one up. And look at what all this information's tell me. This is gold mine stuff. Look, here is the IP address, this is the default router on this one. All this really good information I get off this phone is all enabled on there. Now, and typically, you don't want to disable the web interface because there's a lot of functionality that call manager uses to push down different applications here. But it's putting yourself outside of the network that actually is what causes the problems.

TINA SHAKOUR: But would you normally put any server outside your network?

JIMMY RAY PURSER: Oh, no, no. Absolutely not.

TINA SHAKOUR: Exactly. Its common sense. At some level too, it will. Security common sense.

JIMMY RAY PURSER: Security common sense, right.

TINA SHAKOUR: Yes, which, that's what I know.

JIMMY RAY PURSER: Or this one, look at this one. I type this one in. In title Cisco Call Manager use your options log in to bring you up to the call manager page. And typically, I could tack it with a hyphen edu, because the biggest violators of this, of putting these call managers on the internet is colleges.

ROBB BOYD: What recommendations do you have for -- okay, well I don't want to piss off our college audience or anything. Those are all good Cisco customers as well.

JIMMY RAY PURSER: I'm just --

ROBB BOYD: Because I mean it's a common thing with security, right, that please, let's separate real security issues that need to be addressed, you know, through vulnerabilities that are always going to have to be addressed and true insecurities versus misconfigurations, right?

JIMMY RAY PURSER: Well, and those are all misconfiguration.

ROBB BOYD: Right.

JIMMY RAY PURSER: And let's just face it.

ROBB BOYD: Two separate arguments, alright?

IP Telephony without the Migration Migraines

JIMMY RAY PURSER: In the --- huh?

ROBB BOYD: Two separate arguments, though. I mean upon addressing security, I can't address every misconfiguration because we can only dummy proof things so far.

JIMMY RAY PURSER: Well, I mean, in security we're always talking about what's called the defender's dilemma, right? I mean the defender has to defend thousands of vectors into the network. The hacker just needs to find one. When I first got into voice, one of the cool things to hack was intercepts you know where I could actually steal voice calls and listen and stuff.

JIMMY RAY PURSER: But you know, who wants to hear about how much bread I need to buy at the store?

ROBB BOYD: Well the challenge is how do you collect the right information, because you collect a lot of stuff only trying to find that one piece that was actually intelligible or something that you were interested in hearing.

JIMMY RAY PURSER: Too much crap, yes. It takes --

TINA SHAKOUR: Yes.

JIMMY RAY PURSER: It is a what we call a low-yo hack. It takes more time than the information's value out of. Where my valuable information is in toll hacking. That's where the money is. As a matter of fact, one of the biggest hacks, if you look at the stats out right now, 90% of the biggest hacks that they are reporting are toll hacks on voice over IP systems because a lot of people are not securing the gateways and they're allowing people all over the world to do all these things. And one of the old school attacks that we used to do all the time on the (inaudible) and stuff is what we called two staging, where you dial a phone number over the PBX, you find a company and you say, okay, it's 317-555-1212 is your directed more dial number, that's your number. So I'm like, okay so chances are the phone company assigned you your exchange, 555-1200 or 1 --

ROBB BOYD: Find your range.

JIMMY RAY PURSER: (Inaudible) so I'll find your range and I dial that top range, and that's typically the phone number of the PBX. Well if I dial that, click, I hear another dial tone, brmmm. That means I've got access at dial anywhere in the world.

ROBB BOYD: Now isn't that an issue with configuring trunk-to-trunk transfer limitations though on that? I mean that's another configuration issue is not allowing an inbound trunk to have been connected to an outbound trunk. Because we used to call in and just do a social hack, right?

TINA SHAKOUR: Right.

ROBB BOYD: We could just call in and connect me to an extension 30 something, something and as soon as I hit one of those digits to transfer, they got a dial tone. I need extension 9011, you go pow, I'm right back up the other trunk.

JIMMY RAY PURSER: Yes, that's two stage hacking, you know.

TINA SHAKOUR: It absolutely is about restricting what's going on. I mean we've seen companies that have actually stopped voicemail forwarding of your phone because people would then use that as a way to, even from the inside you have to worry about your users.

ROBB BOYD: I never (inaudible).

TINA SHAKOUR: Right, they'll forward their phone to a long distance number and then use that as a way to call that long distance.

ROBB BOYD: When I was in college, I used to put it on my answering machine, the gate code, so that I could always call my home number that would open the gate to the apartment complex that I was living in.

ROBB BOYD: You know, just feed the DTMF Pack to the thing when I called in and the gate would open every time and it's handy for my friends coming over.

IP Telephony without the Migration Migraines

JIMMY RAY PURSER: Heck yes.

ROBB BOYD: Well get us into, how do we?

JIMMY RAY PURSER: Well now here's one way that you can stop so that toll fraud. I actually cut a sample of some configs here. And actually, what we're doing is we're configuring our direct inward dial so that we can prevent an external hack. And a couple of things that we're setting up here is that we'll assign this direct -- and this is where folks make the mistake right here. They don't assign it to the port. They leave that port open so people can direct in more dial in, and here I'm saying I'll accept this direct inward dial so people dial into the network and they must be dialing a number on our exchange and that's the only place it's going to go. They're not going to be able to do a two-stage hack.

ROBB BOYD: Okay, that's a similar type of limitation.

JIMMY RAY PURSER: It's a really quick, simple setup here. We're just exercising it -- there's really nothing to it.

TINA SHAKOUR: Yes.

JIMMY RAY PURSER: And it should be something that we have set up in here, too. But we also have folks that are taking advantage of things like being inside and dialing (inaudible) lines. If you have cleaning crews that come in and they'll use your phone, and everybody knows what's the outside line number, 9. You know, everybody knows 9 the key to PBX, you know. So a key at PBX, but I think it's really cool, one of the things that I actually learned from another SE that actually understood voice a bajillion times I did, so thanks for the tip, is that you set up an afterhours block pattern, and you're saying what you're going to block based upon a certain time of day so that I can prevent cleaning crew, for people coming in late at night and making these international calls. Because, ten o'clock over here to midnight, everybody's -- or ten o'clock, people here are gone. Other parts of the world, they're just waking up. That's primetime calling time. So you could set that up.

ROBB BOYD: Alright, set up services.

JIMMY RAY PURSER: Absolutely, so you could set up your restrictive here which is a really cool way to prevent people from going into your network.

ROBB BOYD: You mentioned back in the SIP segment, you're talking about being able to have a firewall that understood.

JIMMY RAY PURSER: Yes.

ROBB BOYD: The protocols and things of this nature. Obviously, the Cisco firewalls, the ASA, what are the things that we need to be aware of with the ASA or things that you would call out that are specifically catered to preventing some of these things, put to rest some of the hacks, cracks and whacks?

JIMMY RAY PURSER: Well, see that's what we call a SIP pair pinning, and what we like to do is that we like to, here we are, here's our code billing, got our phone set up, and we had our trunk line set up, is our SIP trunk, and bigger than that, everything is going pretty good and everything's happy. What I want to do is if I'm a hacker out here, I want to be able to send a SIP call, a SIP acceptance message in here, to the internet to your machine, have you process it, and hairpin it back out to the location. And the big thing that's happening right now, if I'm in a SIP trunk, you'd be in big, it is huge and a hacker community. What you see a lot of hackers doing right now is that they're selling these SIP trunks back to a SIP provider. That's actually legally selling these services back to another business.

ROBB BOYD: Does the SIP provider know that they're getting --

JIMMY RAY PURSER: No, they don't. A lot of them --

ROBB BOYD: Looks like you're laundering packets now?

TINA SHAKOUR: Yes.

JIMMY RAY PURSER: Yes, a lot of them really don't know, so your hackers are out there finding these open trunk lines on my way to do the SIP here panning out, and then they sell these servers, they sell it to anybody. I wonder if you've seen a lot of startup SIP trunk providers provide this. Or they'll configure up -- I'll tell you one of the things that we used to do to test

IP Telephony without the Migration Migraines

systems is we'd set up a rogue PBX. We'd go out and download some open source software. We'd set up our rogue PBX. We'd send our rogue invites back and see if they get accepted because a lot of people, SIP does have the ability to check inside the message and make sure that any bogus fields are confirming back with the provider.

ROBB BOYD: So kind of a bidirectional authentication.

JIMMY RAY PURSER: Exactly.

ROBB BOYD: Okay.

JIMMY RAY PURSER: That goes into the standard. But I would say that eight out of ten installations I see SIP it's like, that is not configured because maybe the provider doesn't want to give the information, the provider did and then they moved some things around, and then now SIP's ignoring it, and it's not being processed correctly. So you're having people hackers intercept this stuff up. They're either calling their international calls, or more importantly, they're using your servers to sell -- I mean it's software and servers, right? I mean they're just selling that trunk service out to somebody else.

TINA SHAKOUR: What about the destructive nature, though, of some people? I mean I've heard a lot of people talk about denial of service attacks with IP telephony. I mean have you seen or heard any notorious cases around that, or?

JIMMY RAY PURSER: You know, I have, and that's really of less importance because there's a lot of really good SIP tools. Now, when it comes to a lot of hacking, some I do most myself online because it works a little bit better. And I use a lot of stuff out of the BackTrack 4.0, which is in beta, download today, and they do have a really nice voice package in there like SIPVicious and SIP PP that allow me to actually go up and set up sessions in (inaudible) and captures traffic. But there's a couple pretty good Windows tools out there, SciVis is one, that allows me to actually go out and, number one, find any SIP components on a network. Now SIP, being an internet protocol, I could do this from my house, I can find out your, instead of finding out your exchange, I can find your IP address. I can scan, find out what you're listening for, and I can scan your targets.

ROBB BOYD: This is what I love. Now you could hack from home. You don't have to go to the office anymore.

TINA SHAKOUR: Yes, it's --

JIMMY RAY PURSER: You know, it's all about talking to me, and it really is.

TINA SHAKOUR: Remote workers, mobile workers, it is really important, yes.

JIMMY RAY PURSER: It is, it really is. And now I send all my stuff up here, I configure all my host stuff I could do my scanning, do my -- and once I find what I need, I can replicate in type. Now see, look it, this is a SIP message. You know I can type in anything I want here, I can send out what type of message I want to send. I can send my invite, my register. I can start sending out if I want to do an attack, I can start flooding your network with goodbyes, and boom we're canceling sessions left and right.

ROBB BOYD: So you're crafting custom packets in a tool like this essentially to create whatever mess you want to create.

JIMMY RAY PURSER: Absolutely, but you see it's all plain language. And what I'm counting on is that your network is not verifying the source from the SIP message back and forth because you can stop this really, really, really, really easily.

ROBB BOYD: It's a configuration issue once again.

JIMMY RAY PURSER: It's once again a configuration issue.

ROBB BOYD: People aren't turning on things that are available. This might be my point when it comes to security though is because once things start working, people quit messing with it and then they'll take you to the next step. They go and making phone calls and receiving phone calls. What else is there?

JIMMY RAY PURSER: Well look, I mean look how simple this is to fix. Now look, I got a config how to stop a rogue PBX on the network, and that's typically where people are actually setting up these free services here. And look how easy it is. I'm setting up an access control list, but I'm using the oldest trick in the book. At the end of every access control list is what?

JIMMY RAY PURSER: An explicit deny, exactly. So all I'm saying is that this is the IP address of my upstream SIP provider. This is

IP Telephony without the Migration Migraines

his address, and that is their SIP proxy that I'm connecting back to and I'm explicit. Anything else in there, you drop it. It's just an old school rule. It doesn't take much to configure this stuff up.

ROBB BOYD: I really want to ask you something before we run out of time and Tina's probably not going to like this because this probably goes against every Cisco marketing rule in the book, but I think the elephant in the room a lot of times these days is the open source PBX. It's the -- and I don't know if we need to bring up names or anything like that, but it's the idea that a lot of customers go out there and they look at lower cost solutions that appear, obviously I'm couching my language already, but the idea is that they go and they say, I can do everything you can do but cheaper, and I can support myself and there's a base of users. Heck they got a wiki I can -- and I'm a smart IT guy. I can figure this stuff out. And so they go this open source route just being honest to the extent that we can take our hats off here on a Cisco show but how legitimate is that these days? Are the things we need to worry about or they're positives? So where would you place any of that?

TINA SHAKOUR: When you buy that open source system, it is great.

ROBB BOYD: Yes.

TINA SHAKOUR: Until you get fired.

ROBB BOYD: Okay.

TINA SHAKOUR: For whatever reason, right?

ROBB BOYD: Okay.

TINA SHAKOUR: And then nobody knows the password to the system and nobody knows how to support it, and nobody knows what's configured. That would be the first red flag for me. And in a small situation, Joe's Crab Shack, whatever.

ROBB BOYD: That's actually a pretty big company.

TINA SHAKOUR: Okay.

ROBB BOYD: But I know what you mean, yes.

JIMMY RAY PURSER: Pretty good job with that you know those fat bowls they have with the different --

TINA SHAKOUR: Oh, God, I mentioned food.

JIMMY RAY PURSER: That was so good.

ROBB BOYD: That is the best topic. What's the reality? You've played with a lot of these. You've used them for hacking demonstrations before and things like that.

JIMMY RAY PURSER: I still do, yes, I use them all the time. Look here's the thing. Open source software, any open source software follows a simple rule. It's cheap to acquire, expensive to keep, you know? If I've got a staff full of people who really like tweaking and peeking and stuff, then that's great. If it's a smaller company, smaller area, smaller part of your network that you want to have private communications with them, whatever, it's okay, but it does require a ton of tweaking to set up. It is not easy to set up. It does require a lot of configuration. That number we're talking about the SIP trunking exploits out there, I said that that's one of the bigger, the toll fraud?

ROBB BOYD: Right.

JIMMY RAY PURSER: That's one of the biggest attacks out there today, about 80%, the majority of those are from open source software because it's kind of tougher to set up. The majority of the setup at the command line, and a lot of folks kind of get lost in that stuff. Now there is some open source GUIs that are both on top of it. But again, you know, what I'm doing is, to achieve the level of service that I want to be on the phone, because look, I said this in the other segment that it is a hard sell to sell me on voice because my voice system is incredibly reliable. And now if you're putting a open source solution here and stuff, and I'm having to do third party band aid, band aid, band aid to make this work, now you're really talking me out of the solution pretty darn quick.

IP Telephony without the Migration Migraines

ROBB BOYD: Well it gets back to, you'd mentioned earlier some of the key critical things that someone looks for when making a transition like this is redundancy, scalability or the flexibility pieces that come into this kind of thing, are we, it doesn't sound like we're getting that out of open source.

JIMMY RAY PURSER: No, because look, check out, because you know, so if I'm looking at setting that up if I've got an open source PBX down here, if I have a feature like phone page and I'm sitting on my phone up and I want to page people on here, well you know on our system, that's typically some multicast or a bunch of subscriber so you send it out, everything happens here and stuff. On an open source packet, each one of these are unicast, and so this overwhelms pretty quickly.

ROBB BOYD: Well, yes.

JIMMY RAY PURSER: Now I start putting this on my WAN, and now I'm trying to do this --

ROBB BOYD: Your WAN bandwidth is close to nothing.

JIMMY RAY PURSER: It drops dramatically. So what do I end up doing? Well, I got to put a PBX down here. And then what? And I need to put another PBX at this branch office. And again, my complexity is increasing. My cost is definitely decreasing and stuff, but now I guess --

ROBB BOYD: Well, depending on how you measure cost.

JIMMY RAY PURSER: Well, yes, so now I can start hiring people that understand this, that manager stuff to keep it up. Any of these little tricks something is kind of hard to --

TINA SHAKOUR: You got to treat them well so they don't leave.

JIMMY RAY PURSER: Yes, and some of these things to try and get themselves to work like I wanted to, it takes a little bit of time. And the codex that they want to use, like let's see this one? Oh that's not free. It's kind of one of those things where your mileage may vary. You want to test it. If it works, that's great. It's all for saving that stuff. But if you're kind of new to your phones, your handsets, you pay for a few different features and stuff you may not get them and stuff, test them and see if you like it. Every vendor out there, they're including those offers of small business package. You don't spend a lot of money getting the voice.

ROBB BOYD: Yes, look at that first.

JIMMY RAY PURSER: It's pretty cheap. Yes I would definitely -- your mileage may vary. Check and see what you like and kind of work from there.

VALERIE ST JOHN: Alright, we've got some good information here. Thanks guys and a special thanks to you, Tina. Awesome, awesome addition to this show. Okay, to look at certification opportunities in the voice realm since we've just spoken with the Voice Chick, we're happy to bring back another addition to our girl power team, Mary Ang. Thanks for joining us, hello.

MARY ANG: Hello. Thank you for having me.

VALERIE ST JOHN: So what do you have for us today?

MARY ANG: Well, some pretty exciting things. First of all, Cisco is moving beyond the idea of we're just a voice PBX vendor towards collaboration as the umbrella category. Collaboration equals voice plus video plus applications such as WebEx. So, within the certification and training group that I work in, we have some pretty exciting stuff. Three things, path, lab, and finally a new TRAK. So on the path, what I'd like to talk about is CCNA Voice.

VALERIE ST JOHN: Okay, so what is CCNA Voice? Tell us about it.

MARY ANG: CCNA Voice is the first opportunity for a network engineer to distinguish himself as a voice specialist. So if you have a CCNA, and you pass one additional exam, we suddenly tag you as a CCNA Voice Specialist, and so you're able to go on to voice installations and do very dedicated, higher skilled, more knowledgeable kinds of activities. So we added --

IP Telephony without the Migration Migraines

VALERIE ST JOHN: So this is very specific. It's different from the previous certification because it's broken out separately.

MARY ANG: Exactly, and so we've allowed now the people to take a CVOICE 6.0 exam. CVOICE is a very, very popular exam, and it is more of an enterprise option. So there's another way to qualify for CCNA Voice.

VALERIE ST JOHN: Okay, so we've got voice. What's the second certification?

MARY ANG: The second one would be lab. The lab exam is going to change for the CCIE Voice. It's the first time we've cut over to the 7.0 platform. It will have more challenging environments like mobility and presence and continue to extend the troubleshooting aspects. So as many of our CCIEs know, that exam was a bit long in the tooth, and so we're really excited that the new exam's coming along in July. We're on the new platform now, the Unified Communications Call Manager 7.0. That's very good, to support the rest of Cisco. And finally, TRAK. This is the new and exciting -- what I'm very, very motivated by is that we're seeing that video is becoming more mature, and that any network engineer has to think about video on the net, MediaNet. So we're launching a brand new track called the VideoTrak, and two TelePresence specials will be released at that time for TelePresence.

VALERIE ST JOHN: Oh, wow. Very, very exciting stuff. Thanks for joining us. We'll look forward to that.

MARY ANG: Sure. Thank you very much.

VALERIE ST JOHN: Alright, I'm completely convinced. Robb, what's the last word to any of remaining skeptics out there?

ROBB BOYD: We don't use the word skeptics and I think we've been having a lot of fun making fun of the headache involved, and since we're making a transition, all the things you need to worry about. But I think if there was any one key thing that hopefully comes out to anybody that's watching this show is that the transition is not something to be afraid of. There's more options now moving from a mature technology to, quite honestly, what is a very mature technology that allows you to do a lot more with your business these days. And really, what I learned from Tina is about, it's about good record keeping, it's about doing the right prep work, and it's about all the headaches you can avoid if you'll just take the time, pull a few key records, make sure you have them in the right place, check with your power users, some very key basics, we'll have all those in the show notes as well, and you can prevent a lot of disastrous things from happening down the road. It's not something you should be afraid of.

VALERIE ST JOHN: Excellent. A stitch in time. Sounds like very, very good advice. Alright, for Robb Boyd and Jimmy Ray Purser and Tina Shakour, I'm Valerie St John. Thanks for joining us on TechWiseTV. And to find out about future episodes or to check out a complete archive of previous shows, be sure to visit the Cisco interaction network at cisco.com/go/interact.