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Sahil Malik Fills Us In on Sharepoint 2010!
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[Music]

Brandon Wenn: From runasradio.com, you're listening to RunAs Radio, the Internet audio talk show for IT professionals with Richard Campbell and Greg Hughes. This is Brandon Wenn, announcing show #133, with guest Sahil Malik, recorded Sunday, November 1, 2009. RunAs Radio is produced each week by PWOP Productions, providing professional media and podcasting services online at pwop.com. You can follow the boys on Twitter at twitter.com/runasradio.

Richard Campbell: Thank you very much. This is Richard Campbell. With me as always, my co-host, Greg Hughes.

Greg Hughes: Yes you are, and yes I am. How are you today?

Richard Campbell: I'm well, sir. Want to do a RunAs Radio?

Greg Hughes: Yeah, let's do something.

Richard Campbell: Why not.

Greg Hughes: Yeah, you know it's always fun.

Richard Campbell: It's always fun. How was your honeymoon, Bub?

Greg Hughes: The honeymoon was great. We went to Hawaii, on the big island on the dry side of Kona Coast. I've never been there before. We had a terrific time. Now we're back. Glad to be back, but sorry to leave kind of thing.

Richard Campbell: Oh, yeah. No kidding.

Greg Hughes: But it was terrific, thanks for asking.

Richard Campbell: None the worse. Hey, let's just dive right into this because we've got our regular troublemaker here. Sahil Malik is a .NET author, trainer and consultant. He has worked on Microsoft Technologies since the DOS days. He is heavily invested in Sharepoint and he loves it.

Sahil Malik: Yeah. It's me. Hi.

Richard Campbell: SharePoint is your friend, Sahil. You told me that yourself.

Sahil Malik: It is, but you know for today let's stop talking about SharePoint. Let's talk about Greg's honeymoon instead.

[Laughter]

Greg Hughes: Ah, the analogies will abound, yes I'm sure.

Richard Campbell: Has 2010 actually shipped now, Sahil?

Sahil Malik: No, it hasn't and it will ship sometime in the first half of 2010...

Richard Campbell: Okay.

Sahil Malik: Which a lot of us are translating to May 31.

Richard Campbell: Nice.

Greg Hughes: That's logical.

Sahil Malik: Yeah.

Richard Campbell: That's the first half.

Sahil Malik: Yeah, but you know we don't exactly know what the date will be, but Beta 2.0 is going to be out at the end of November and the NDA has finally been ended so we can start talking about it.

Richard Campbell: Oh, yeah.

Greg Hughes: Good, finally.

Richard Campbell: And of course I know you've been tortured by this because we've done other shows with you and you already knew a bunch about what's going on 2010 but it was all a secret.

Sahil Malik: Yeah, I know it's hard to keep a secret and I've been working with 2010 for than a year now. I started working on it August of last year and the last year that we did was more on the 2007 line. There was more on the line of talking about challenges that we faced on 2007.

Greg Hughes: Yup.

Sahil Malik: But you know, there are a lot of shows that have been done on what is good about 2007. There's plenty of good about 2007, but everybody does those shows so we took one that's a little more practical. But specifically the things that we picked in previous show were things that were going to be addressed very well in SharePoint 2010 which we can talk about freely now.

Greg Hughes: So let's do that. What is it and why do we care about SharePoint 2010 and what do we have in store?

Sahil Malik: Okay. So there are a lot of things that we're trying to run through as many as we can in the show. I would say from an IT Pro side of

things, what are the things about SharePoint 2010 that makes me excited? Probably at the top of the list would be the RIA Architecture Services model.

Richard Campbell: Wow, that's big. That's huge. So literally the core services that change the way it's laid out.

Sahil Malik: Exactly. So earlier, in SharePoint 2007 you had something called the Shared Service Provider and as I've mentioned in the previous show, the Shared Services provided the biggest limitation and that was that you could have one word that could be managed by one shared service provider at a point only.

Greg Hughes: Yup.

Sahil Malik: So that created scalability. So that created a flexibility issue, but what I've done this time around is that in SharePoint 2010 there will be no Shared Services provider. Instead there will be these services that you can manage and administer independent of each other, and when I say manage and administer independent of each other, what you can do is that for SharePoint 2010 you can go into Central Administration Managed Services and you can pick a service and you can appoint an administrator on a post-service basis.

Greg Hughes: Give us examples just to be clear about what the services are. I can appoint administrators over what different components or services?

Sahil Malik: As an example, one of those services could be user profile import. This is something that will run in the background. Another service would be search, and you know rather than having one farm administrator who is responsible for everything under the sun and the poor guy is overloaded and looking for a new job by now, this portion can now delegate the management of these services on a one-by-one basis. Another example of such services could be Excel services for instance.

Greg Hughes: Got you.

Richard Campbell: So the idea here is that you can assign someone to only have the privileges to do administration of the users. They don't get any access to anything else.

Sahil Malik: The user profile site, and so you can appoint administrators on a post-service basis. So you just select the service and click the administrator's button on the ribbon and then those users would be given access to Central Admin but they can only manage the service that you designated them...

Richard Campbell: That's great. That sounds grown-up. Actually this is the way SQL Server has done it forever.

Sahil Malik: Right. SharePoint is grown up finally.

Richard Campbell: Finally.

Sahil Malik: Gotten fatter too.

Greg Hughes: And it's about time.

Sahil Malik: Yeah, it's doing a lot better. Okay, and so another advantage of this is that services can now be offered to sites on an a la carte basis. So earlier, what you had was the website that you associated the SSD with got everything that the SSD offered whether or not you needed it. So if you don't need Excel services, you'll still get it. It's a part of the package.

Richard Campbell: Right.

Sahil Malik: So it's like an all you can eat buffet style. But now you have the ability to offer certain services to certain sites or split the service between a number of sites. The advantage of that is that typically in hosted scenarios if there's somebody who doesn't want Excel services and maybe -- now the licensing on this, I believe, is still being worked out but you still have the possibility of if somebody doesn't want Excel services and possibly didn't want to pay for it, technically speaking you have the possibility of not offering them Excel services, whereas somebody else on the same farm can be offered Excel services.

Greg Hughes: Ah, okay.

Sahil Malik: So that's nice. Then another advantage that you have, because of the RIA Architecture Services Model, is that now you can scale your services to more than one machine and so you can have a separate farm whose job is nothing but to offer services. So the consumer farm and the provider farm can communicate to each other using service proxies, and you can have a farm whose job is nothing but to provide services to other farms.

Richard Campbell: Now why would you do that?

Sahil Malik: Well, one, from a scalability perspective that once you have the ability to split out a certain service into more than one machine, that's a proper farm.

Greg Hughes: Does it also impact things like high availability? Does it give you better options in terms of making sure that you have good resiliency?

Sahil Malik: Exactly. And another advantage is data segregation. For example, maybe

you have a situation where you've run multiple SharePoint farm than some extranet users and some internet users, and you don't want those user profiles to get mixed up with each other. So for that service, potentially you could have two separate farms or two separate machines and two separate instances of a service running and you could communicate to each other and share that service with the separate farms.

Greg Hughes: That could substantially change the extranet story, couldn't it?

Sahil Malik: Absolutely. It would make it a lot better absolutely.

Greg Hughes: Yeah.

Richard Campbell: Right. Now, if you want to provide extranet access, pretty much anybody who gets into your SharePoint has access to all of it.

Sahil Malik: Anything that's on the farm, that's right, especially on the side of user profiles.

Richard Campbell: Right, right.

Greg Hughes: So multiple Active Directories, separate Shared Services, but yeah, they can interact with each other. Am I hearing you right?

Sahil Malik: Yeah and as I've said, in the previous version there were solutions to all of these problems but all of the solutions are cumbersome.

Greg Hughes: Right.

Sahil Malik: And now you have a solution coming out on Microsoft so everybody is going to do it in a one consistent manner. So that's always nice.

Richard Campbell: Right. It just makes it easier.

Sahil Malik: Right, exactly. Now there are a couple of *gotchas* about sharing services, one of them is that not all services can be or should be shared. So services that generally have that have it on databases can be shared. Another ramification of that is that you would think that sharing services would also require the consumer forms service accounts to get access to the databases of the provider farm databases. That's really not the case because the consumer always proxies through the provider and therefore you can have services that are in different Active Directories, and the need for direct SQL permissions to the paying farm configuration of service databases doesn't arise. So that's some good thinking on their part where you don't need to give direct SQL rights to the child farms or the consumer farms configuration of service databases.

Greg Hughes: So is this effectively being managed as a role – the services that are being managed as a role-based access so SQL Permissions per se don't apply?

Sahil Malik: Well, SQL Permissions do apply but they apply only within one farm, but anytime you want to go across farms the farms will communicate to each other over proxies and therefore the database access is still limited to the local service accounts, not other guys' service accounts.

Greg Hughes: Got you, okay. That makes sense, sure.

Richard Campbell: All right, and these all sound like scalability features, like these are all things that let me build a much larger system. I also get additional security granularity, but if I really want to build a big SharePoint farm here I've got these new features to really help me.

Sahil Malik: And manageability too.

Richard Campbell: Right.

Sahil Malik: So okay, so that's probably one of the things that as an IT Pro is extremely exciting as far as SharePoint 2010 goes. The second one is any SharePoint project that we dealt with; most of them required some custom code.

Richard Campbell: Right.

Sahil Malik: And the custom code has deployed using solutions and features. The problem was that when somebody is deploying a solution and feature, by definition it means that they have access to the file system and by definition they have access to the file system and they can do things like impersonation without providing passwords.

Greg Hughes: Right.

Sahil Malik: They had a lot of rights on the SharePoint 2007 server.

Greg Hughes: Sure.

Sahil Malik: So even without a password, using custom code you could impersonate to the SharePoint/System Account and you could go edit a list that you would otherwise not have access to and there are good reasons why it's architected this way. But administrators are always a little bit nervous because the reality is nobody had the bandwidth to audit every piece of code that was deployed to your SharePoint Server.

Greg Hughes: Right.

Sahil Malik: In the real world, you just won't do it. So it was difficult to guarantee, especially if you

have a large installation and you have two farm administrators and you have five development teams and everyone was showing up with their solutions to be deployed.

Greg Hughes: Yeah.

Sahil Malik: It was difficult to guarantee that those solutions won't hurt your server for one, and it was difficult to guarantee that those solutions won't interfere with each other, and it was difficult to guarantee that any one of those solutions doesn't have a wild true System.Threading.Sleep.

Richard Campbell: So it would basically kill the machine.

Sahil Malik: Basically kill the machine, right. It was difficult to guarantee all of those scenarios. Now, in SharePoint 2010 you have a concept of farm-based solutions and sandbox solutions. Farm-based solutions are still worth all the equivalent of the solutions that we're used to now. So farm-based solutions are something that a farm admin would install and they have unfettered access to the server.

Richard Campbell: Right.

Greg Hughes: Okay.

Sahil Malik: But now they've introduced another level of solutions which is sandbox solutions, and sandbox solutions are solutions that, as the name suggests, run in a little sandbox so they're in a little protected environment. So they cannot do that much damage to your server. So sandbox solutions are prevented from doing certain things and as a result they're safer. Also they can be monitored by the administrator. So the administrator can do things such as you can say this site will not deploy more than three solutions, or if this site deploys a solution, it will not conjure more than a certain amount of CPU and if it does it, stop that solution. So it will intercept that and it will stop the execution of the raw solution.

Greg Hughes: Does it stop it permanently or it just stops that one instance of it then allows it to try again, or what limitations there?

Sahil Malik: It will allow it to try it again, but then if it tries to do that again it will stop it again. And then you can also have, using custom code, you can build reporting on top of this where you have the ability to see, well, this site has been convening so many CPU resources. So just like decent virtualized infrastructure where you're managing a farm of virtual servers and you would overtime manage its CPU utilization and say, "well, you guys have been using a lot of CPUs so here are some more," or, "you're not using enough, we're going to take away some." So you have the ability or the insight into your server to be able to do all that with some custom code now.

Greg Hughes: Cool.

Richard Campbell: And I was thinking you could do this in 2007 by using Virtual Machines as your isolation.

Sahil Malik: Right.

Richard Campbell: But this is the easier way to go about it.

Sahil Malik: And again, as you say Virtual Machines have an isolation that by definition means that you are -- you can be a part of the same SharePoint farm...

Richard Campbell: Right.

Greg Hughes: Right.

Sahil Malik: Because your stuff is going to run on any website, at least the ones that your site has permission on. So in a good isolation, practically to get isolation earlier was that you just create your own farm and in your own farm would be five machines at the minimum. So it was expensive.

Richard Campbell: Right. Is there a layer where the sandbox provides some access into the farm, as well as some isolation so it's sort of in-between the total virtual approach?

Greg Hughes: Yeah, I'm kind of curious. What are the restrictions that are put on a sandbox solution as well?

Sahil Malik: Well, first, the layer is really not -- you know, it's not a negotiable layer. What I mean is that it's not -- a sandbox solution can do certain things and that's what it can do. You don't have a negotiation going on over there that allows you to impersonate and do certain other things because that would sort of defeat the purpose. So you don't have the bargaining going on. You can't impersonate and do more things because one other thing that sandbox solutions will allow you to do is that because they're safer and because they are also -- you know, the administrator can have it more restricted so the administrator can have more control on what those sandbox solutions can do, the administrator can now delegate the uploading of these sandbox solutions to the site collection administrators. So the collection administrator doesn't have to go through the administrator to install the solutions. All what they can do is they can just go to site action, site settings, and in there there is a new thing called a Solution Gallery. The Solution Gallery is where they would upload their WST which should contain a sandbox solution and make their features available using that.

Greg Hughes: So what are the limitations that are put on a sandbox solution? How are they operationally different in the detail from a standard solution?

Sahil Malik: Sandbox solutions support things such as you can create a list definition, a list instance, you can create content, types, and fields. You can affect the migration of your site collection. You can write web parts. You can have event receivers, add item receiver, list event receiver, or web event receiver. You can create custom actions as long as those custom actions are within your site collection and you can do Workflow, and I maybe forgetting one or two. But I guess your question is what can sandbox solutions not do? What are they prevented from doing? So they are prevented from doing web applications go features, our farms' go features, and editing custom actions that affects central administration, and also certain things that you'll run into. Honestly, all of these weren't documented so I've run into a few that weren't documented. It was that if I was trying to affect the page layout using a sandbox solution making an AJAX call, asynchronous call from the code-behind, then that would also block. So things in general that potentially could affect the running of your server are blocked in sandbox solutions.

Greg Hughes: So sandbox solutions, I mean that's a pretty big deal from just the day-to-day management and operation standpoint, and the security quality standpoint. What else in 2010 really stands out as a big improvement or something that is brand new?

Sahil Malik: Okay. So again from an IT Pro side of things, another thing that stands out is much improved back-up and recovery scenarios. One of the things that we've had to do very frequently in SharePoint 2007 is that we have to have a back-up and recovery farm. So as an example, what would happen is users would delete a document. Well, okay, fine. I can go pick that document from the content database, so that's great. But then sometimes they would delete a site which doesn't go into recycle bin.

Richard Campbell: Ugh.

Sahil Malik: Or they would go and delete a site collection and that doesn't go in the recycle bin.

Greg Hughes: Right.

Sahil Malik: And believe me I've done it.

Richard Campbell: Entirely too easy to do, right.

Sahil Malik: Yeah. I usually don't want to delete this, and it's late at 8:00 p.m. at night and you're working and you hit the space box and then you go, oh crap.

Richard Campbell: I just deleted everything.

Sahil Malik: Exactly. So now what they've provided is that you have the ability to attach a content database and what they call as content recovery and you can restore a site, site collection or something else from that previous content database without having the need for a separate back-up, restore, recovery farm.

Richard Campbell: Is the back-up and restore now more granular? It used to be you have to restore quite a bit. You couldn't actually pick and choose what you wanted to restore.

Greg Hughes: A restrict site.

Sahil Malik: Or really what you had to do is that you would have to restore an entire content database.

Richard Campbell: Right.

Sahil Malik: And the content database contains fine site collections. You'll get all the fine site collections back.

Richard Campbell: Right.

Greg Hughes: Yeah.

Sahil Malik: And it wasn't exactly as simple as that because some of the site collections may interfere with the URLs of the existing site collections, maybe a new worker. So then what you have to do is that you would have to remove the current content database, then restore the previous content database, then pull that one site collection or the one item that you would have encrusted in, and then detach the old content database and reattach the current content database, and then restore the thing that you pulled out in the current content database.

Greg Hughes: Done that. Been there, done that.

Richard Campbell: It sucks. I'm getting cold sweats just hearing this described.

Sahil Malik: So again, the issue in this is that it would definitely cause a downtime on your production farm if you did this on you production farm. So you wouldn't do this on your production farm. You would have a separate recovery farm.

Greg Hughes: Right.

Richard Campbell: Right.

Sahil Malik: They basically obliterated the need for that recovery farm. Now what you can do is that you can just point your content database, attach it, and then the content database becomes available to you in a read only form and you can extract parts of it out and then restore those parts into your current part in database. So it makes things a whole lot more convenient.

Greg Hughes: Substantially for sure.

Sahil Malik: And a corollary of that is that you can now attach read only content database to a farm so that allows users to view content within site collections but not change it.

Greg Hughes: That's kind of cool.

Sahil Malik: It's very useful because I was thinking that this would be very useful in Enterprise Content Management scenarios where let's say that you're organizations get audited and you want to put a freeze on the current state of content at a global level, then you would simply change that site collection to read only, or the content database to read only, and bingo, you're now guaranteed that people can still access the content but they can't change it anymore.

Richard Campbell: Right, yeah. From an auto perspective that's pretty compelling. But also from a sort of recovery perspective to be able to have that read only state bill that goes through the thing.

Greg Hughes: Just spin it up and look at it.

Richard Campbell: Yeah.

Greg Hughes: Yeah.

Sahil Malik: Oh, absolutely.

Richard Campbell: This sounds very SQL Server. This is something I would do in SQL Server, it's bring a database up in their read only state.

Sahil Malik: Right. And so SharePoint is basically just building on that absolutely same concept. It's becoming more and more mature, and also from another scenario that helps is in a high availability scenario because what you can do now is that you can create a logship content database to a second relocation and let's say that your main farm goes down, then users can automatically start browsing a read only version of the farm on the second farm before the failover has taken place.

Richard Campbell: Cool.

Sahil Malik: This should be an easy way to implement high availability with the used functionality so your users won't complain. But as you've said many times, Richard, if you want 100% high availability that's extremely expensive for those two minutes users who can access the content in a read only farm, and it is cheap to implement that, then a lot of organizations will probably make use of it.

Richard Campbell: Yeah. That's the 99% solution for a tenth of the price.

Sahil Malik: Exactly, exactly. In this case, this is probably the 90% solution for 1% of the price. Exactly.

Richard Campbell: Yeah and I think a lot of folks are going to find that worth it. It's at some way to get back to what I absolutely had to have.

Sahil Malik: Exactly. I think many people will end up making use of that.

Greg Hughes: From an IT Pro perspective, what is the story, what does it look like to migrate from Sharepoint 2007 to 2010?

Sahil Malik: Oh, I'm glad to say that the migration from 2007 to 2010 will be a lot less painful than the migration from 2003 to 2007.

Greg Hughes: Well, we'd hope so.

Sahil Malik: I guess the only big hump I see in the migration to 2010 would be the high requirement for hardware and software. SharePoint 2010 is 64-bit only.

Richard Campbell: Right.

Sahil Malik: And it requires SQL 2008 and Windows 2008.

Greg Hughes: Okay.

Richard Campbell: Requires? You need to have these current licenses.

Sahil Malik: Yup and a lot of large organizations still are heavily vested in Windows 2003 and SQL 2005, even SQL 2000.

Greg Hughes: Yup.

Sahil Malik: So over time I guess when they have enough reason to migrate to 2008 and they see the advantages that SharePoint 2010 brings them, I'm hoping a lot of them will upgrade to newer technologies. But from an actual upgrade perspective, it's one of the things that I was really happy to see. It's that in SharePoint 2010, the UI has changed a lot so they've replaced the current SharePoint UI with the ribbon-based UI.

Richard Campbell: Oh, nice.

Sahil Malik: And yeah, so what they call it is a visual app that you can upgrade your SharePoint farm to 2010 but you can choose to continue to run 2007 UI even though you're...

Richard Campbell: Ah, okay.

Sahil Malik: Yeah. So users, don't get confused and even though you are running your servers or your entire applications on 2010 now, it will still look ad feel like 2007, and site collection by site collection you can upgrade the UI experience, and now the users will gradually get used to it.

Richard Campbell: Well, and that's smart too because a lot of users fumble with the ribbons. T he fact is that you can take your time moving across that. I don't want to jump away from this upgrade yet because I think this is not --you know, you said upgrades can be better, but it still sounds like typical 2007 deployment is 2003 R2 on the operating system 2005 in SQL Server. So you're going to have to do your OS's first, then your database, and then upgrade SharePoint.

Sahil Malik: For a long time we were, even for 2007, we were saying that you should try and stay on 64-bit operating system.

Richard Campbell: Yeah.

Sahil Malik: Now let's say that if you are running on Windows 2003, the first step would be to change towards Windows 2008-based SharePoint 2007.

Richard Campbell: Right.

Sahil Malik: And then you can run the various upgrade tools to upgrade to SharePoint 2010.

Greg Hughes: So then you're talking about an upgrade in place.

Sahil Malik: Pardon me?

Greg Hughes: An in-place upgrade as oppose to build a new system and migrate, is that what you're talking about?

Sahil Malik: That would be an in-place which would be the let's say the Mac approach of things that you just push a button and it gets everything done. Of course, if you wanted the piecemeal upgrade, you could always move the content databases one-by-one from Windows 2003 to Windows 2008, and SQL 2005 to SQL 2008.

Greg Hughes: Right.

Sahil Malik: And then you could attach those content databases in SharePoint 2010 and do an upgrade on those one-by-one.

Richard Campbell: Okay.

Greg Hughes: Okay.

Richard Campbell: I would think in a production environment, you would build new infrastructure with 2008 and so forth and migrate things across.

Sahil Malik: I think it depends on the production environment. I think the smaller shops will probably be okay with doing a one shot upgrade.

Richard Campbell: Yeah.

Sahil Malik: But yeah, larger installation especially ones with a lot of custom code. Anytime we talk of upgrade, the thing that worries me the most is custom code because that's where a lot of best practices have been not followed and then those are the ones that will break when you upgrade to the next version and as a result frequently what happens in larger installation is that you just think of re-architecting the project because then you can also take advantage of the newer features of the product.

Greg Hughes: What about reverse compatibility on custom code? Are there any *gotchas* there? Have they kept things backward compatible, or what do you anticipate people are going to see?

Sahil Malik: That's one of the best things about Microsoft that, you know, the edit.com that was written in DOS works on Windows 7.0. So it's still the same core, still the same engine. So most of it is backwards compatible now. There are things that have been deprecated, things that they don't recommend doing anymore. Example, you know when you created views in SharePoint 2007, you had to write gobs and gobs of really ugly XAML-based code.

Greg Hughes: Yeah.

Sahil Malik: So that's been replaced by XXL dbase views which is a lot nicer, however the older stuff will still run.

Greg Hughes: Okay.

Sahil Malik: Then you have STPs, notably site templates have been deprecated and there is a newer, better way of doing that using the web XAML tag.

Greg Hughes: So my old site templates will or will not work?

Sahil Malik: They'll work.

Greg Hughes: Okay.

Sahil Malik: But if you're creating new stuff, you shouldn't be using them. And truthfully, I always stay away from site templates because they cause a lot of problems. You know, it was just a lot easier to write features to start automate what the people are trying to do. So I stayed away from STPs anyway, and a lot of us did which is why they came up with a better solution for that.

Greg Hughes: I guess my cautionary question approach here has to do with first being introduced with SharePoint 2001 and going to 2003 and then 2007 and seeing the, you know, what is a web part changed a few times, and so it's at least heartening to know that the things that we've worked on on 2007 we'll be able to operate on 2010 in order to ease that migration and not have to do with everything at once.

Sahil Malik: Oh yeah, and another thing to consider is like the list web part that was introduced in SharePoint 2003 was not like the web part that you were suppose to write in 2007 but it still work and it was used heavily and it will still work in 2010 as well.

Greg Hughes: Okay.

Richard Campbell: Sahil, we're running out of time here. Any final words about the 2010?

Sahil Malik: Yeah. One little nice thing to have is that SharePoint 2010 users PowerShell heavily so you can just activate the feature and get a whole library of PowerShell commandlets like hundreds of them.

Richard Campbell: Right.

Sahil Malik: And that just makes managing SharePoint a ton easier.

Greg Hughes: That's very good.

Sahil Malik: You bet.

Richard Campbell: All right, Sahil, thanks so much for filling us in. I'm excited to see what 2010 is going to bring us.

Greg Hughes: Thanks, Sahil.

Sahil Malik: Thank you. Me too.

Richard Campbell: And we'll talk to you next time on RunAs Radio.