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Richard
Campbell

RunAs Radio is a weekly Internet Audio Talk Show for IT Professionals working with Microsoft products. The full range of IT topics is covered from a Microsoft-centric viewpoint.



Greg
Hughes

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Rory McCaw on MOM 2007
May 23, 2007



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Carl Franklin: From runasradio.com, you're listening to RunAsRadio – The weekly Internet audio talk show for IT professionals with Richard Campbell and Greg Hughes. This is Carl Franklin, introducing show #7, with guest Rory McCaw, recorded May 10th, 2007. RunAs Radio is produced each week by Pwop Productions – Offering professional media and Podcasting services, online at pwop.com.

Richard Campbell: Hi, this is Richard Campbell, and you're listening to RunAs Radio and with me as always, Greg Hughes.

Greg Hughes: How are you doing?

Richard Campbell: I am enjoying myself, got another great show here.

Greg Hughes: And it's been -- we've had a lot of great shows and a lot coming up, so what do we have today?

Richard Campbell: This is the seventh show, already, and you know time's just flying by, I am really enjoying the tightness of this show that a half hour seems to be working for me, one topic thoroughly discussed, but I always feel like when we finish there is three more shows I want to do about it.

Greg Hughes: Yeah, I have had the same thing and the beauty of that is that you know, maybe some of these terrific people we have been speaking with, we will be able to get them back and ask more detailed question and do some deep dives into more specific areas, so certainly if our listeners have any thoughts or questions or areas that they'd like to hear in more detail on then, send us an email info@runasradio.com and we will take that into consideration, and we'll get back with the people that we speak to on the show, and see if we can get them to dive into some more detail.

Richard Campbell: You bet, we can definitely get those questions answered for you whether we answer or get the guest answer and we will figure it out one way or the other, so, info@runasradio.com.

Greg Hughes: I have also the thirty minute plus time frame I think, it works really well us, but it also seems to be working really well for people who are listening. What I've been hearing is that, it's just the right amount of time.

Richard Campbell: Excellent, you know the IT community is different from the development

community, doing shows for .NET Rocks! with they're an hour long, the developers seem to all want to listen on the bus.

Greg Hughes: Right.

Richard Campbell: I don't know -- let us know of how you are listening to the show?

Greg Hughes: I think, the IT guys want to listen between World of Warcraft sessions or Old School Counter-Strike melees is what they are doing and so ...

Richard Campbell: Or while they are flipping CD's installing something.

Greg Hughes: Exactly, you only have so much time when you are a busy IT guy.

Richard Campbell: I think that's true. All right Greg, let's introduce our guest. Rory McCaw is the Principal Consultant at Infront Consulting Group, a Microsoft Gold Certified Partner based in Toronto, and the author of a number of technical books, including the Microsoft Press, 'Operations Managers', 'Administrator's Guide' and 'How to Cheat at Managing Microsoft Operations Manager 2005'. What a great title.

Rory actively consults to large organizations helping them in their change, Operations Management and security initiatives. Rory holds numerous industry designations in addition to being an accomplished public speaker who has delivered numerous webcasts and online learning sessions on MOM 2005, SMS 2003, SQL Server Reporting Services, Branch Office Infrastructure and Security and has spoken on these and other topics at industry events such as MMS, TechEd and Comdex.

Rory also regularly develops hands-on lab content for different Microsoft events. Rory has been nominated as a MOM MVP for the last 3 years and actively posts to his blog at spaces.msn.com/rorymccaw and regularly participates in technical communities. Rory is also the author of the MOM 2005 and System Center Operations Manager 2007 bootcamps which deliver in-depth knowledge transfer to customers using Operations Manager. Welcome Rory!

Rory McCaw: Thank you, glad to be here.

Richard Campbell: Well, you definitely have an area of focus and a product, I have also found fascinating but never had enough time to really dig into.

Rory McCaw: Yes, it's definitely something that we enjoy working with, it gives us some exposure in the enterprise medium and large into all of the different areas and often crosses what normally politically boundaries, in from an administrative perspective, and allows us to work with folks in the Windows, Intel Groups, as well as the Security Groups and then sometimes Networking and UNIX, Linux monitoring as well.

Richard Campbell: It's an interesting place to be, to sort be able to bring all of those monitor operations together and I am trying to think about, what it was like to before MOM. I mean, are we talking about this as an alternative to open view, those kinds of tools?

(00:05:13)

Rory McCaw: Well, I guess it could be, I mean we certainly have done a lot of replacements of tools or enhancement of the tools like OpenView, or Tivoli or other Operations Management infrastructure type products, be it maybe from NetIQ with their AppManager and Security Manager, I think what tended to happen in most companies, and really is still there in a lot of cases depending on the sides and the life cycle of that organization from an IT administrator perspective and how quickly they've grown and developed. I think, a lot of companies are still really leveraging the built in system tools, in the underlying operating system or tools specific to a given application and unfortunately, they don't really have any centralized monitoring application in place, that they can collect a fairly rich set of data, that alerts them to potential issues and allows them to become more proactive.

Greg Hughes: So, IT professionals that are managing systems now, but don't have a monitoring and alerting just a general maintenance monitoring capability. What do they get with MOM out of the box? So, for some guys that's looking at, hey that sounds like that might be interesting to be able to know, what's happening on my network, what's the default?

Rory McCaw: Right, so great question and out of the box, I get the experience depends on the version you are working with, most customers right now, would likely be working with or have already deployed say, MOM 2000 and MOM 2005 but seeing that the release of Operations Manager 2007 just came to market back in March, what we are seeing as additional benefits that you would have had say, you may not have had, with the previous version which you now see with Operations Manager 2007 include the ability to monitor for event performance and alert type information and generate alerts based on events, so that we can be more proactive in how and

when we are notified of issues in the environment and then beyond that, we can also receive detailed notifications to different types of devices. So, within MOM 2005 we were somewhat limited with the notification capabilities particularly, the ability to schedule and to target notifications based upon say a skill set, like your database administrators group or your security group whereas we now have many more granular settings and different options available to it, to allow to target that information to the appropriate group but also based on maybe the location of the server so, if you have an administrative group over in Europe and one in North America, we can send up alerts during the business day in North America to obviously go to the people responsible for those systems over here and then as the clock rolls and we go online as far as business hours in the UK or in Europe, then we can have alerts forwarded over to those individuals, so that we end up really achieving a follow the sun type of operation from a monitoring perspective.

So, those are some of the basic things, obviously, we want the ability to centrally collect event information as well as performance information, so that we can store that in data warehouse and report on that for a long term trending and analysis but we also want to be made aware of critical issues on our Mission Critical Systems, in the past with MOM 2005 again, that's primarily have been servers but now what we are seeing is also extensibility into monitoring the desktop environment and I think, where we are seeing that becoming even more critical and of interest, is organization that face compliancy or regulatory issues be it HIPAA, SOX, ISO whatever that issue is, they can now look to the Audit Collection Services component that's a part of Operation's Manager 2007 to help them address those needs centrally collect all of that security information which, within a larger organization just on your DC's alone can be significant or if not overwhelming inside, and Microsoft is now integrated near real-time security event log and centralized collection mechanism through that forever beta product ACS, the Audit Collection Service.

Richard Campbell: So, fundamentally are what we talking about here is a tool that's good at bringing those event logs, those audit records and so forth from different machines into one place?

Rory McCaw: Pretty much, I think you've nailed on the head there, we are looking at centrally collecting that, but take it one step further because if we just centrally collect the event log information, you are going to have -- it's going to be like finding a needle in a haystack...



Richard Campbell: It's already a needle in a haystack on one machine.

(00:09:54)

Rory McCaw: Yes exactly, it's hard to pinpoint a given event on a single machine, so the value add that's brought it through the rules in the manager packs and now the monitors in those packs, where it will do the filtering for you, so that the most critical events bubble to the top of the console and you can see the change in state of a given server or service, or a set of components that are integrated for example, like a distributed application that you want to monitor within the Operations Management Console.

Greg Hughes: So, instead of centralizing the haystack maybe we are centralizing the needles?

Rory McCaw: Exactly.

Richard Campbell: Oh. What a great line!

Rory McCaw: That's a great way to put it.

Greg Hughes: One of the big questions that tends to come up for people that are not intimately familiar with all these different IT Management type of systems that are available is what's the difference between SMS and MOM?

Rory McCaw: That's a very good question and the one that comes up all of the time, and really at one level they can do very similar things but when you break it down and look at each of the features, SMS is really designed for change in configuration management, so you were to look at the say the Microsoft Operations Framework model, you'd see the four quadrants and in the changing quadrant, that's really likely where SMS would fit in although because of what it can do now, with operating system both server and desktop deployments, it makes it into other quadrants as well, but Operations Management really fits into the operational quadrant and allows for management or really monitoring of the systems that are out there.

Whereas SMS is more designed to assist you in deploying and configuring an operating system and additional applications collecting ASAP related information and underlying system configuration information, that's where you see a little bit of similarity between the two because the discovery process is now within Operations Manager allowing you to enumerate a significant amount of information and that in itself can be reported on, that we can see I can say a configuration state change. Where we are

starting to see a lot of overlap between the two with things like the desired configuration monitoring or DCM, which is a feature pack for SMS 2003 which allows you to monitor your configuration changes of a server's configuration and on an ongoing basis then report on that and generate alerts on that, that in itself can integrate into MOM, so that the alerts can actually be generated from within Operations Manager and that information collected, the configuration change information collected through SMS can then be monitored and reported on or alerted on through operations manager.

Richard Campbell: And it's good to see that Microsoft is actually putting those tools together to some degree.

Rory McCaw: Definitely although what we are seeing often times, is SMS today is really more of a desktop tool...

Richard Campbell: Right pushing apps to the client machines.

Rory McCaw: Exactly, so we don't often see the SMS client on the server whereas MOM has always been more of a server based tool, and we don't often see that agent on the desktop.

Richard Campbell: Although as you allude to earlier, 2007, I think the big move here is doing more that desktop capture.

Rory McCaw: Yeah, exactly, so I think we will definitely see some convergence coming on.

Richard Campbell: All right, you know I have always looked at MOM as really an Active Directory exchange centric product but if you are capturing all the event logs naturally, you are going to get some stuff from other products, but one area I have never really seen MOM spending time is on the Web Form side.

Rory McCaw: That's true, the focus certainly for Microsoft has been the push to monitor active Directory and exchange and I think, a lot of that comes because it's a fairly easy sell for them, exchange in Active Directory are within 80% to 90% of organizations and they don't really have a centralized monitoring tool to do that nor do they have something that has been written with the depth of knowledge that the exchange and Active Directory product group have in the creation of the rules for the management pack.

Richard Campbell: I always figured that, IT has the fear around Active Directory and Exchange.

Rory McCaw: It could be that as well. There is no question.



Greg Hughes: Now you mention the term management pack maybe, could you dive a little bit into that and it's really not just about weblogs, is it?

Rory McCaw: No definitely not, so MOM can -- MOM or Operations Manager, however we wanted to refer to it now, can collect from what they called providers, and there are a number of different providers, the event logs are obviously one of a number of them, and probably one of the easier one's to collect from, but we can also natively collect SNMP Traps as the Operations Management agents as well as the Management Server can be an SNMP receiver and that's all configured through the underlying SNMP support within the operating system, that the agent or the server's running on.

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In addition to that, we can also pull from say the Syslog on a UNIX, Linux system or a device, we can now enumerate network devices, then we have network device discovery although there is no management pack currently from Microsoft to actually provide rules in monitoring those, we still are left to create those on our own and look to a third party and then we can also look to simply a raw log file and the raw log file could be a log file that say maybe a SQL traced file or W3C Flat File, that gets written to you by the World Wide Web service.

So, going back to the point about monitoring your World Wide Web and different web enabled applications, one of new features in Operations Manager 2007 is the ability to monitor or really create your own distributed application monitor, so that you can tie the client side which may be accessing your application through Internet Explorer or another browser to a web front-end and that could be a have a Load Balancer, say an F5 BIG-IP device in front of that and then behind that Load Balancer could be an array of IIF servers running version 5 or version 6 on a given version of the OS and then that in itself could be maybe connect to BizTalk which feeds into four or more databases and then connects out through the Message Queuing components in the other databases as well, and we can track and monitor each aspect of the transaction and then alert on the help of that.

Richard Campbell: It does strike that there is a lot of bits here that are already free in the OS, you know the Perfmon part and event trapping, I mean a lot of those things could be by hand if you want it to. I am aware, the pricing on MOM is not trivial, this is an expensive product.

Rory McCaw: It is yeah, definitely it's an investment that an organization makes, but on the flip side, if you would look at trying to define a process internally and then developing an application even at line of business and internal application to do what MOM does, it would still be a fairly costly endeavor and we have worked with organizations going down both roads, so we have experience in both of those areas and there is a significant cost to custom development and then there is an ongoing support cost to that as well.

Richard Campbell: Right.

Greg Hughes: I think, that there is you know being an organization that does use MOM and then seeing the benefits of having that proactive monitoring and the alerting capability, there is an investment that has to be made in order to implement that, capital investment and somewhat of an on going investment for management and you could also say that there is an investment in not doing that in terms of the cost of having a system that you do not have an effective monitoring platform for and the operational costs of downtime and a bunch of other related potential issues that MOM in a relatively inexpensive way, can help you to recognize.

Rory McCaw: Definitely, I think there is probably a lot of benefits in looking at the different features and functionality that can make an organization more efficient, if they are ready for that we've seen a lot of return on investment from some organizations that had a lot of manual review processes that required the different folks to onsite and paying them overtime and the cost reduction and savings going forward is easily going to surpass their investment and their Operations Management functionality and technology.

Richard Campbell: I am also thinking in terms of just having a set of decently mature best practices around, that naturally are going to come out of MOM, on what to monitor? The biggest complain I have for anyone who drives into Perfmon is well everything's here, what do I need to watch?

Rory McCaw: That's true So, just having the knowledge from the individuals the product groups that wrote the code is certainly a huge asset and then something that we haven't seen in a lot of other products that are out there from an Operations Management perspective and selling that void especially from third party companies because they don't understand the Microsoft technology as well as Microsoft does.

Greg Hughes: You know, I think a lot of IT departments over especially over the last couple



of years, I have really been charged not just with keeping things up and running and putting the right applications in place but securing them as well and then how do you know that it's secure? Where does MOM come into play? How can I use MOM to help me solve that Problem?

Rory McCaw: Well, a good question. So, MOM now with 2007 offers what is probably Microsoft's longest beta product that finally found a release vehicle and that's the Audit Collection Services. So, we finally see that which I think was previously a Resource Kit Tool for a number of years get released into the MOM agent as its release vehicle, so now the agent say MOM 2005 ran as the MOM service, if you were to look into your services, now it runs as the Ops manager Health Service for operational day-to-day monitoring, health of the OS and application but there is also an ACS Forwarder service that lives on every system you deploy an agent to.

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Rory McCaw: So, it's not a separate install, it's an integrated deployment and that second service is disabled by default but should you decide to enable it, what it will do is in near real time it will start collecting every single event that gets logged to your security event log and passing that back but storing it into a different database not your operational database where that Perfmon data and your event and alert data is, but something specific to your security event log.

Greg Hughes: Gotcha!

Rory McCaw: So, that's providing a pretty powerful solution to organizations that have to deal with regulatory and compliance related issues in helping them to manage that. One of the issues that we have seen in trying to implement other technologies, other applications and even custom in-house developed applications was because of the sheer volume of event data written to the security log, it was often too much information to actually pass across the wire on most corporate networks, especially when we are talking with WAN connections and that sort of distributed topology. But now that data is normalized on the actual Agent folder and through the normalization process and then a further compression process the actual network bandwidth in utilization is relatively small and can be distributed across and pull information from multiple different systems.

Richard Campbell: So, they ship some of the work to the client machines that cut down on the wire stress?

Rory McCaw: Exactly.

Greg Hughes: It sounds like Microsoft is certainly from an architectural standpoint addressing the need for distributed applications in networks and if we are going to be monitoring those, then being able to take that environment, especially is just becoming more and more prolific.

Rory McCaw: I think they have definitely done a great job in redesigning the architecture and I know that one of the big customer pain points now anyone migrating from MOM 2005 to 2007 is really looking at a parallel installation because of those significant architectural changes but the investment going forward is going to be worth one.

Greg Hughes: So, what else about MOM? We've had an awful lot of good things to say about MOM. Where is it now? What are some of the pain points that are maybe addressed, you've touched on a couple and what do you see for the future?

Rory McCaw: Well, it's still pretty early in the actual release but we're seeing different things on a regular basis and the product groups have done great in helping us to try to resolve some of these and get answers out to the community but some of the issues that we are seeing are in clustered configurations, the installation of the Ops manager database on a SQL 2005 cluster works like a dream but installing a clustered Root Management Server which is one of the new management servers roles in 2007, we've not yet been successful in actually getting that installed and configured using the documentation provided and have a few support cases open around that type of an issue. Outside of that we're also seeing some clustered discovery related issues and they seem to be related to SPN registration. So, those service principle names are becoming very, very important to make sure that they've been created correctly so that the discovery process can work and function as expected.

Greg Hughes: Sounds like yet another example of where clustered systems can create a bit of a cluster if you will in terms of the difficulty of actually getting things to work initially.

Rory McCaw: It's true, there's certainly some added time and configuration requirements around working with clustered configuration. But the benefit of high availability and reliability is worth to some organization.

Richard Campbell: So, the 2007 edition they are calling System Center Operations Manager.



Rory McCaw: Yeah.

Richard Campbell: And that also ties in with this new product called ForeFront. Do you want to talk a bit about where they are going here?

Rory McCaw: Well, I am not sure I can really speak that well about ForeFront per se but I certainly can provide some background on System Center. System Center is really just Microsoft's new brand for their change in configuration management and operations management and security tools as I understand it. What we are going to see are products that fall into that category like Ops Manager, like now the renamed SMS or Configuration Manager or Virtual Machine Manager, Service Manager which is their ticketing system that's in development and change management database application as well as Data Protection Manager are going to fall under that System Center umbrella.

Richard Campbell: Right, so it's just bringing all of those products together under a common naming scheme?

Rory McCaw: Exactly, so I view that more as -- or being very similar to the office branding where when you think of office, you think of a suite of products not something that you made by individually but you'll buy and work with some or all of those.

(00:25:00)

Richard Campbell: Right, anything we need to talk about as far as Vista and MOM?

Rory McCaw: Well, there is certainly some Vista monitoring capabilities that are available within Operations Manager, not sure right now, I mean we have one customer that's fairly large in size with evaluating a Vista deployment and then the on going monitoring of those Vista systems but outside of that customer, who is in the evaluation stages and planning, we really haven't done a lot in by the way of managing and monitoring desktops with Operations Manager. I think we will see some changes there but I think, it's still pretty early.

Richard Campbell: This is very much a 2007 version feature that they are getting into.

Rory McCaw: Yeah, definitely, they had a Management Pack in 2005 for desktop monitoring but it wasn't really cost effective based upon the licensing structure and MOM 2005 really didn't scale that well to go out to thousands of desktops.

Richard Campbell: Yeah, you're better off with the hundreds of servers.

Rory McCaw: Exactly.

Greg Hughes: Are there any major licensing changes between the 2005 and the 2007 editions?

Rory McCaw: I think, from a licensing perspective most of the licensing is very similar. The one thing that we are seeing become a consideration maybe not an issue but at least a consideration and often a stopping point initially in the proposal phases is the cost of monitoring your security infrastructure. One of the requirements in the new architecture is for each what they call now an Audit Collection, collector or an ACS Collector which is really just a management server that can be dedicated to the collection of that security log information from multiple agents that are known as ACS Forwarders.

There is a direct correlation between the ACS collector and a database itself, now it can be talking about an Instances SQL or multiple instances running but we need to have a dedicated ACS Audit Database for each one of the collectors. So, if we scale that out across a large enterprise, we are seeing the need for maybe four to upwards of ten or more collectors, each one of those requiring its own database and that database needing for performance reasons and supportability to be enterprise edition of SQL, so there is a significant cost associated with that.

Greg Hughes: So, let's talk a little bit about Management Packs, can you maybe explain about, what they are you know, you know we have the default that ships with Operations Manager, what else is available and maybe also, what if a Management Pack doesn't exist for the application that you have a real need to monitor?

Rory McCaw: Right, so Microsoft puts out a number of different Management Packs for a lot of their products and they are still because we are fairly close to the RTM release or just after the RTM release, they are working converting a lot of their MOM 2005 Management Packs, so that they work and function properly in Operations Manager 2007. One of the big issues I think they are finding, is a little on to this more simplistic rules, work rules that are simplistic would be things that look for criteria such as the source and the event and the Event ID, those should translate over pretty easily what is going to be a little more complicated to transfer over, or any of this synchronous transaction rules and when I say synchronous transactions, all we're



really talking about when moving from MOM 2005 to 2007 are script based rules.

So, those scripts generally don't migrate over successfully and I think that's what Microsoft is spending some time on. The other core change to Management Packs and one of the fundamental differences is now all of the Management Packs from Microsoft are being sealed, which if we are familiar with MOM 2005, I could import a Management Pack from Microsoft, I could go in and edit a given rule, I could save those changes and I'd be done with that until a new release came out and if I didn't follow best practices which would have been to copy the existing rule disable the original and then modify the copied version which would have its own grid, I would probably overwrite my changes that were likely specific to the client environment when I went about upgrading to the new version of the Management Pack.

To avoid that sort of nuisance and problem that tended to raise in a lot of calls, they have now signed and sealed each of their Management Packs which means that you can't even go in and disable a rule or a monitor, it has to actually create an overwrite to do that.

Richard Campbell: Right. So, you're really, the core functionalities are always the same and then you are applying rules on top of it to alter it the way you want but that also means there is no way for you to actually get your work overwritten.

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Rory McCaw: Well, I guess it's possible to put an overwrite on an overwrite but what I understand you are saying is, you are not able to overwrite Microsoft's work?

Richard Campbell: Well, you can overwrite Microsoft's work but they by sealing it, there is no way for you to go in and make direct alterations to their things which means when you update it there is no way, you don't have any risk of being overwritten, you are keeping your rules external to the Management Pack.

Rory McCaw: That's correct and often in your own Management Pack or Bill Gates created and what's known as the Default Management Pack out of the bar.

Greg Hughes: This sounds like a sort of a thematic Microsoft change has been taking place in a number of products where in the past maybe you had the ability to gain access to and make subset of changes to certain settings, they found that resulted in a high support cost or potential difficulty and in some cases I think, security risks,

so therefore they sealed these things, and in most cases tried to give you some kind of other mechanism to try to accomplish the same thing.

Rory McCaw: I agree and concur, the problem though in fixing the one problem is probably going to lead to some additional problems that they may not have considered. Some of things that we are seeing are really now the inability to create overwrites for particular maybe for a script that's used in a rule, because those parameters aren't exposed and because it's sealed, we now don't have access to the script itself. So, although they are protecting their IP now, at a much stronger and deeper level, it's really preventing the person in the field, the customer, the consultant from actually making some changes that are required for their environment.

Richard Campbell: Right, that sounds like showstopper kind of failures, you are going to not be able to deploy this pack, because you can not make the alterations you need to, to make it work.

Greg Hughes: I would think, that this would be, especially difficult for existing MOM customers that are looking at upgrading to the new version.

Rory McCaw: Yes, it's definitely a part of their criteria and evaluation process for sure and I think, worst case is they would just have to disable that rule and looking at rewriting the logic themselves but that in itself is a pretty costly endeavor depending on the complexity and not all the organizations have that skill set.

Richard Campbell: And we asked about this, well maybe we need to get into it a little more, so I don't have the Management Pack for my product, what can I get from MOM?

Rory McCaw: So, if you don't have a Management Pack for your product, it depends how your application has been written, so if your developer's did a good job at instrumenting it, you should probably have a messaging DLL that exposes each of the event ID's and then the corresponding messages that are associated with those ID's that you normally see in your event logs.

Richard Campbell: Right, so you are still writing, them, if you are writing events to the log at least.

Rory McCaw: Yeah, then you are in good shape, now if you are not writing events to the log then maybe you are writing events somewhere else, so maybe it's a log file not the event log per se, and if that's the case we can use the log file provider that native Ops Manager and we can certainly grab that information, we can do



searches based on regular expressions, or Boolean regular expressions or based on an equal condition or otherwise, so we can grab that, but if your application hasn't been instrumented to provide any level of detail, it's going to be difficult to monitor, what you're probably looking, at the worst case, is just monitoring for service availability of that given application and we can easily do that through the Management Pack templates that Microsoft has introduced and are available in the offering section of the Operations Manager Console and really literally within maybe three to five clicks, you can define a rule or now monitor, that will allow you to monitor that given service, or multiple service.

Richard Campbell: Rory, we have really enjoyed talking to you about Operations Manager certainly, interesting things going on with the new version coming.

Greg Hughes: Some great information.

Rory McCaw: Well, thank you it's been my pleasure.

Richard Campbell: Thanks very much, and we will be talking to you again next week on RunAs Radio.