

# IT Automation: Overview

## Kumar Goswami



Opening: music and graphics effects

*Kumar Goswami, Utility Infrastructure Management Department, HP Labs*

(Voice over narrator) HP Labs' Kumar Goswami explains why IT Automation is the backbone of a cost effective and, more importantly, agile, predictable, adaptive enterprise.

### *The need for automation*

If you look at it, the bulk of IT management is very manual and labor intensive. So if you really want to reduce cost and come up with a more cost-effective way to manage your IT systems, you have to find a way to automate these IT tasks. Furthermore, if you look at these IT tasks, they're not really fit for human cognitive skills. Some of them are repetitive and boring, some of them are very complex, and so in the process of working on these things, people invariably inject errors. And now diagnosing those problems takes a lot more time and it is even more huge costs, if you will. And so by automating these tasks you're able to create an agile, repeatable and more importantly a very predictable IT environment and that's what CIO's are looking for.

### *Manual and labor intensive*

It has a lot to do with the way we design and operate our IT systems. You know especially when you compare and contrast it to other systems, like say the auto pilot system on the plane or your auto transmission in your car. These systems are closed-loop, they're self-managing and automated and they were designed to be that way from day one.

Whereas our IT systems are open loop, and the state of the practice is to somehow get this thing up and running and you test it, and then once it's running, you stand back and you pray or maybe proactively reboot it, but that's basically the approach. And it has a lot to do with the way we write and develop and design these systems. For example, when you write the software, we can't formally prove that it does what we set out to do. The error handling that we have is minimal and not well documented. The visibility that we can provide from the software system is also something that's sort of ad hoc and not designed in. So all of these things make it very difficult for us to automate and create a closed-loop system, and that's why they're so manual and labor intensive today.

### *Automation approach*

Well at HP Labs what we've been doing is investigating ways to use models to drive automation. And maybe the best way to explain this is through an example. Imagine I've given you a couple of computer systems, and I ask you to put this data base system on top, you know with mirroring and high visibility and so forth. Probably you're going to need a user's guide to help you do that, a user's guide that describes the data base system. And so you're going to read through it and eventually figure out how to do that. Well that user's guide is essentially a model, it's one that a human can read and understand. Now imagine if we could take the information that's in that user's guide and put it in a form that's interpretable and readable, if you will, by a computer. If we can do that, we can automate all those tasks that you just did manually.

### *Types of models*

You can't have one monolithic model. Rather, you need models for each of the different parts of the IT system. So for the infrastructure there's models that describe the infrastructures. Models that describe the applications, models that describe the business services that you're finally trying to actually create. These models aren't new, they exist today. For example, the CIM model, the Common Information Model, it's a DMTF standard, Distributed Management Task Force standard, and so it's available today.

### *How to use the models*

We are now investigating how we can use these models to manage the entire life cycle of the services. We're talking about from designing the service—I realize a service consists of, you know a bunch of application components, and figuring out what components you need, where they need to reside, what machines they should be allocated on, and then once we have that—how can we automatically provision all of those components? And then once they're actually running, how do we make sure, in an automated fashion, that they're meeting the service level objectives that we had set out to meet? And within that we're looking at automated ways to diagnose things when things go wrong. To be able to proactively do capacity planning and add more system components as necessary, and use things like control theoretic approaches to do more closed-loop control of these systems.

### *System diagnosis*

Diagnosis is a very difficult problem for our customers. You know they get tremendous amounts of data from applications and from the systems and they're under pressure when the system is not working properly to be able to diagnose what the issue is and fix it in a timely fashion. And so we are working on automated techniques to help facilitate this process. We're using statistical and machine learning techniques to help you basically sift through the data, the hundreds of metrics that you have, and figure out which are the ones to focus on. So given a specific service level objective, say a response time, we are able to tell you, instead of the 500 metrics, look at these few, less than 10 metrics, and it'll tell you where the issues are and whether an issue is going to be taking place or not. In addition, we've developed technologies where we can actually take a digital snap shot of the system, when it's in a bad state, and then compare it with previous snap shots to see if this particular problem occurred in the past, and if so, how it was resolved. So these are sort of machine learning and statistical techniques to help automate and speed up the process of diagnosis.

### *System savings*

We test drive all of our technologies with customers, or with HP's own IT department. So in one pilot with HPIT, we used automated tools to help generate their monthly capacity planning reports for a production system that they have. It was taking them about a week each month to do this. So when we brought in our technologies and our tools, we not only brought that down to a few hours, but we were able to provide much more in depth and more accurate analysis.

### *Next steps*

Automation is the backbone of a cost effective and, more importantly, agile, predictable, adaptive enterprise. And so the technologies that we've been working on are getting incorporated into the tools that we sell at HP. And so I think the best thing to do would be to contact your HP rep, and of course you're always urged to visit [HP.com](http://HP.com) as well ([www.hpl.hp.com](http://www.hpl.hp.com)).

###

## For more information

[HP Enterprise home](#)

[HP Enterprise Live](#)

[HP Enterprise TV](#)

[HP Management software](#)

[RLX Technologies](#)

[HP BladeSystems](#)

[HP ProLiant servers](#)

[IT Consolidation solutions](#)

[Virtualization](#)

[Virtual Server Environment](#)

[HP Integrity servers](#)

[HP Integrity NonStop computing](#)

[HP Services](#)

[HP Software Universe](#)

[HP StorageWorks](#)

© Copyright 2005 Hewlett-Packard Development Company, L.P.  
The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.  
11/2005