

# Introducing vRealize Orchestrator, a step towards Automation enlightenment

by Christopher Lewis

I recently presented a session at the North East VMUG covering, in my opinion, one of the most underrated and underused products from VMware® - VMware vRealize® Orchestrator (vRO). The following article gives an overview of the key messages I aimed to convey during that session and why vRO should step into the limelight.

## Why should the business invest in Orchestration/Automation?

*“The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency.”*

Bill Gates, co-founder of Microsoft

The starting point in any automation journey is to understand why your business is looking to automate. In my view, this comes down to 6 key business benefits:

- 1. Drive Standardisation** – The implementation and adoption of standards is a cornerstone of automation. Moving to a model where IT delivers a process or task in a standardised way across the business, provides a significant benefit in terms of the ongoing cost to manage that process.
- 2. Increased Efficiency** – In a nutshell, efficiency can be defined as ‘a situation in which a person, system, or machine works well and quickly’. By correctly applying automation to a frequently occurring, complex and laborious process or task, the delivery of the process will become more efficient because less time, energy and resources will be expended.
- 3. Increased Productivity** – As the process/task is now more efficient because of automation, it can be completed more frequently in the same time frame by fewer resources. In real terms, this means that those tedious processes, for example, checking compliance of servers monthly, can now (potentially) be run weekly because of automation and can be scheduled to run automatically rather than manually controlled.

4. **Reduction in costs** – There will always be an initial investment in effort (time and resources) that automating processes/tasks will need. But once a task is automated, the ability to run that task when required by the business means the ongoing cost associated with those tasks is reduced. In some instances, you can even get the end user to instigate the process through self-service.
5. **Reduction in risks** – by reducing (or even completely removing) the human element within a process or task, the risk of that process/task failing or being delayed is greatly reduced.
6. **Drive Innovation** – by increasing efficiency and productivity, the business can free up the key resources it needs to work on driving innovation and the next "big thing" for the company.

Now we understand the business reasons behind the desire for automation, we can turn to the tools and technology, in particular VMware vRealize Orchestrator, and why automation is a step towards enlightenment.

## What is VMware vRealize Orchestrator?

VMware vRealize Orchestrator (vRO) is VMware's process and development automation platform that enables users to create and run automated, configurable processes to manage both VMware and third-party technologies. Originally developed by Dunes Technologies under the name Virtual Service – Orchestrator (VS-O), Dunes became a VMware acquisition in 2007. Since the acquisition, VMware have continued to develop VS-O into the product we now know as VMware vRealize Orchestrator. vRO is essentially a graphical tool that can be used to visually develop process workflows. In the event that custom coding is required, there is the ability to use a cut down version of JavaScript.

For those who have heard of vRO, it will be because it is tightly coupled with VMware vRealize Automation (vRA). VMware vRealize Automation is a key component of the VMware Cloud Management Platform, and it provides the ability to grant entitled end users self-service automation of IT services through a secure portal. Within the context of vRA, the flexibility and extensibility of vRealize Orchestrator is used to extend Infrastructure as a Service (IaaS) blueprints, enable Day 2 operations of managed machines/objects and deliver 'Anything-as-a-Service' (XaaS) blueprints.

However, what a lot of people may not know is that you do not need VMware vRealize Automation to use VMware vRealize Orchestrator because it is also packaged and licensed with VMware vCenter Server. Therefore, VMware Administrators already have access to all the workflows, flexibility and extensibility that VMware vRealize Orchestrator has without the additional cost.

## VMware vRealize Automation vs VMware vRealize Orchestrator

Whilst vRA is a key component in VMware's One Cloud vision and cloud automation journey, some businesses are unable to justify the cost or, more importantly, articulate the business benefits that it will provide. The key differentiators for vRA are the ability to:

- support the deployment of workloads to multiple cloud providers from a single console.
- provide organisational multi-tenancy within the hybrid cloud.
- provide a web portal with granular role-based access control
- create a Service Catalog detailing services available for consumption
- provide entitlements determining what a Business user can see and do within the Service Catalog.
- include multiple levels of approval (both pre- and post-) for different types of Catalog requests.

When these functionalities are either not required or can be provided by other toolsets that are already implemented, is there an immediate and justifiable business benefit for vRealize Automation? Sadly, in this case, I don't believe there is.

The good news is, with a little effort, VMware vRealize Orchestrator can be used to develop workflows to demonstrate the power of automation and the business can start to realise the benefits automation has. In the future, once the business has tangible evidence and decides to invest in VMware vRealize Automation, the workflows can be presented as XaaS Blueprints within the Service Catalog as an interim/transition step. The effort already invested in vRO is not wasted because, whilst the recommendation would be to create any new Blueprints as vRealize Automation IaaS Blueprints, the new blueprints can be extended using the existing shared library of workflows and actions developed in vRO.

## VMware vRealize Orchestrator Plugin Architecture

A VMware vRealize Orchestrator Plugin is a solution developed to extend the capability of VMware vRealize Orchestrator by providing pre-built workflows, actions and configurations.

Out of the box, vRO provides various plugins that can be used for basic workflow creation and process automation. These integrated plugins include: VMware vCenter, VMware Automation, Microsoft Active Directory, PowerShell, HTTP-REST, SSH, SNMP, SQL and Mail (SMTP).

There are also an additional 50+ plugins available directly from vendors and via the [VMware Solution Exchange](#). These plugins include solutions to orchestrate Cisco UCS, VMware NSX, Chef, Puppet, F5, Pure Storage, Brocade SAN, Infoblox, Bluecat, EMC VIPR, Tintri and Dell.

An important thing to note is that not all the 3rd party vendor vRealize Orchestrator Plugins are free, therefore you need to check with the vendor around any potential licensing implications.

The extensible nature of vRO means that any external product/solution (such as a Firewall or a Backup Device) that has a REST API can be controlled using the HTTP-REST plugin. If there isn't a vendor plugin for some product/technology you are using, all is not lost. If there is a REST API, re-useable actions and workflows can be written to complete the tasks.

## Practical applications

Over the last few years I have worked with a number of customers that have automated processes with vRealize Orchestrator, these include:

- Deployment of Virtual Machine via a Template
- Adding Virtual Machines to DRS Groups
- Creation/Update/Deletion of AD Objects (such as Users, Groups and Group Memberships)
- Obtaining an IP Address from an IPAM solution and injecting it into a Virtual Machine Deployment
- Integration into ServiceNow to create/update/delete the Configuration Item (CI) within the Configuration Management Database (CMDB) during its lifecycle
- Alerting using SNMP from vRealize Operations into ServiceNow for service desk
- Deployment of Agents (such as Puppet) onto Virtual Machines and pointing the machines to the Puppet Master for on-going configuration

## Why should I use VMware vRealize Orchestrator?

One of the key features of VMware vRealize Orchestrator over other "free" tools (such as native PowerShell or PowerCLI) is the ability to create and customise the presentation layer. This means you can control the way in which the person running the workflow can provide input. This can be achieved by using a dropdown to select a value (either by a manually pre-determined list or generated based on an Action). You can even change the values in a dropdown based on another dropdown. Control of input means a reduction in the potential for human error and a reduction in the possibility of the workflow failing.

As with any form of automation, the real power of VMware vRealize Orchestrator is the ability to easily create, re-use, combine and extend existing Actions (think JavaScript functions) or Workflows to create new ones.

A good example of this is creating a workflow to **Obtain an IP Address** from Infoblox and injecting that information into a **Deploy a VM From Template** workflow from VMware so that the IP allocation is managed centrally for Virtual Machine deployments. You could go one step further and add a **Send (Email) Notification** workflow so that the requestor is notified when the workflow completes (or fails).

## Developing Orchestrator Workflows

Automating using vRO shouldn't be a daunting task. Here are my eight steps to process automation using VMware vRealize Orchestrator:

1. **Understand what task/process you want to orchestrate/automate** – Identify the regularly occurring tasks that take time to complete because of the number of steps involved or the complexity.
2. **Decide whether automating the task/process is worth the "effort"** – filter and sort those tasks/processes into the frequency in which they occur and the effort that they take. This should help identify which tasks/processes to tackle first.
3. **Ensure that the process is fully documented (including testing)** – the person completing the automation won't necessarily be an expert in what the task/process does so it is imperative that the task is documented thoroughly.
4. **Ensure that you can complete the process/task manually first** – it is important to be able to complete the task manually first. This allows for the identification of different inputs, outputs, potential errors and integrations into other systems. There is no point trying to automate a process that cannot be completed manually because you will waste time working out what is at fault, the process or the automation.
5. **Draw the process as a workflow on a whiteboard/paper** – Being able to visualise a workflow and the logic decisions that need to be made will help with the overall process. This will also help with identifying shared/re-useable components.

6. **Create the workflow** – as with any automation, creating the workflow is an iterative (dare I say agile) process that involves continual testing and changes until the workflow is completed.
7. **Test the final workflow end to end** – testing is imperative for workflow development. Ideally a representative test environment will be available so the production environment isn't impacted. You need to ensure that you test all the logic/decisions within the workflow so that all outcomes are understood, especially if you have multiple exit points to the workflow.
8. **Document the Workflow** – the documentation of the workflow is one of the most important steps because it aids on-going workflow development and re-use of the workflow by others. In my view, a workflow where no one understands the inputs/outputs or what it does, is less likely to be re-used by others.

## Is vRealize Orchestrator the only tool I should be using when it comes to process automation?

The short answer is no. I am a big fan of using the right tool for the right job. VMware vRealize Orchestrator is an awesome product, but it will not be right for everyone nor every situation. In my view, vRO should be included within the VMware Administrators toolkit as an enhancement to existing tools not as a replacement.

## The journey towards enlightenment

*"The journey of a thousand miles begins with a single step."*

Lao Tzu

The good news is, that if you are choosing to investigate how you can automate the frequently occurring task/processes around your existing or future private/public/hybrid cloud infrastructure, you are already on the path to enlightenment. You are already working towards removing the technical debt that is incurred by delivering systems and running processes manually. It is not an easy journey because it includes both a culture and mindset change within the IT organisation and the business.

If you haven't made the decision because you think it maybe too difficult or can't decide if there is any value in automating some of the processes. I would urge you to make that leap of faith because the sooner you start on the journey, the sooner you will understand the benefits of automation.

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If you are venturing into automation or want to understand more about how it can benefit your organisation, [contact us](#) and we'll be happy to use our wealth of knowledge and experience to assist you.

## About the Author

Christopher Lewis joined the Xtravirt consulting team in October 2015 and is a Lead Consultant. He has over 15 years' experience in consulting, designing, delivering and supporting enterprise-class solutions within multiple industries across both the Private and Public Sector. His specialist areas include VMware Virtualisation and Cloud Automation, Microsoft Virtualisation and Cloud, and Microsoft Server Technologies and solutions. He is a VMware vExpert 2017.