AZURE POWER AUTOMATION:

How to reduce costs and increase efficiency

How to reduce costs and increase efficiency

What is Azure Power Automation?
Azure Power Automation involves turning on and off virtual servers when they aren't required. This saves costs by automatically shutting down testing environments over the weekend and bringing them back up for Monday morning.
In this post, we will look at why it's important to make use of these tools and how to implement some basic solutions for Azure Power Automation.

Why Azure Power Automation is important
Many businesses operate during a set number of hours. For example, a company might be open between 9am and 5pm. That's 8 hours of the entire day that Virtual Machines are required. If we allow for an hour before and after the day as a contingency, then we only need virtual machines 10 hours per day, or under 50 per cent of the time.

Time (hrs)	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Machine Active									■	■	■	■	■	■	■	■	■	■						
Machine Idle	■	■	■	■	■	■	■	■											■	■	■	■	■	■

The pricing of Azure virtual machines is based on how many hours they are running for. Yes, there are also egress data and storage costs, but the virtual machine cost is normally the largest component. If a virtual machine is required for just 50 percent of the day, then why are we running it or, more importantly, paying for it 100 percent of the time?
The largest share of Azure subscription costs when using Virtual Machines (IaaS) is the compute time: how many hours the Virtual Machines are running per month. If you have Virtual Machines that can be stopped during certain time periods, you can reduce the bill by turning them off (and "deallocating" them).

How Azure Power Automation works

Azure Power Automation uses a feature of PowerShell called workflows to create runbooks. A runbook is an atomic unit, allowing you to automate a piece of work, such as powering up or shutting down a bunch of virtual machines in Azure.

Automation uses something called assets, where an asset is defined as a reusable resource. Examples of assets are credentials (enabling a runbook to sign into Azure to manipulate resources) and schedules (allowing you to automatically execute a runbook at days/times of your choosing).

By now you should start to understand how Azure Power Automation works:
- **Runbooks**: We will have two scripts to start-up and shut-down the virtual machines.
- **Credentials**: We need one asset to authenticate the runbooks.
- **Schedules**: There will be two schedules – one in the morning and one in the evening.

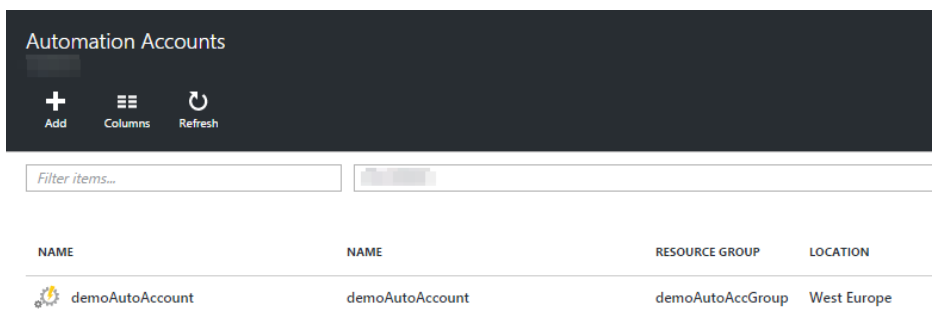**How to implement Azure Power Automation**

The aim of this step by step guide is to use the graphical runbooks feature to schedule starting and stopping of a virtual machine. This will be achieved using pre-existing graphical runbooks available in the gallery, built by the Automation product team.

The virtual machine is of the "resource manager" variety, rather than "classic", but there are specific runbooks that are tailored to each type so use whichever is appropriate to your situation.
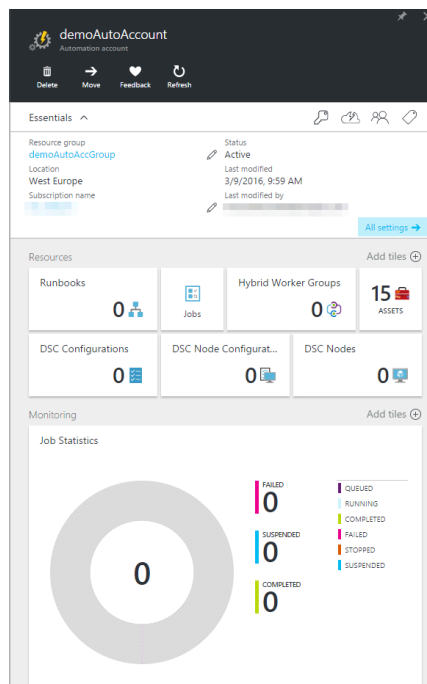
If you don't already have an Automation account, create a new Automation account in the Azure Portal, by navigating to New > Management > Automation and completing the required details.

Once you've created an account you'll see it listed in the Automation Accounts blade.

Clicking on the Automation Account shows all of its details, allowing you to view and create the various resources, and see monitoring information for jobs.
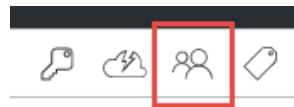
Contact the craftsmen about your cloud hosting and our specialised managed services: info@digitalcraftsmen.com or call on 020 3745 7706

In order to execute PowerShell scripts, whether they are regular scripts, Workflows, DSC or graphical runbooks, you need some form of credential. There is now a specific Automation resource for defining Credential assets.

In this guide, we will use an Azure RM AD service principal. With this, you can assign fine grained role based access to the resources in your Azure directory. For example, the service principal could be assigned the "VM Contributor" role for a specific resource group only. Or it could be assigned full access to an entire subscription. There are many built-in roles and you can define custom roles as well.
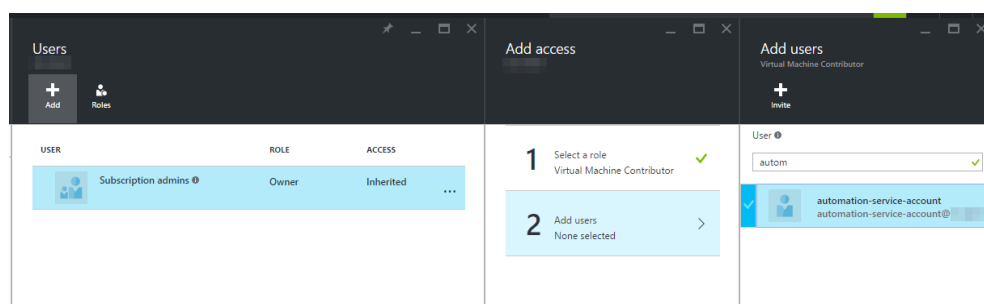
To learn how to create the service principal, follow the steps from a previous post.

Once you have a service principal, you can assign it to a particular resource with a particular role. For example, navigate to the Subscriptions blade, and click on the Subscription you want it to have access to. Near the top right of this blade, there is a set of icons.

Click on the "Access" icon (looks like two people and is highlighted red in the image). This allows you to assign user access.
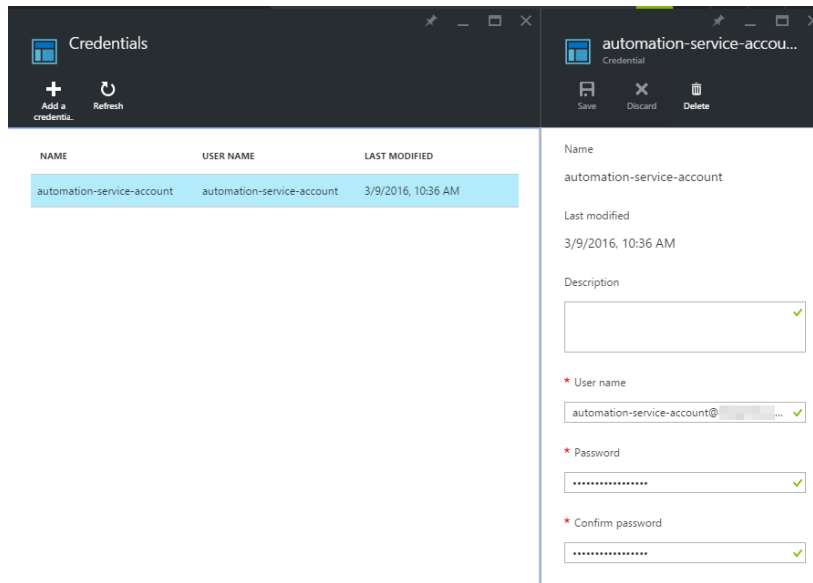

From there select a role, and add the service principal user. You can use the search box on the Add Users blade to find your service principal.
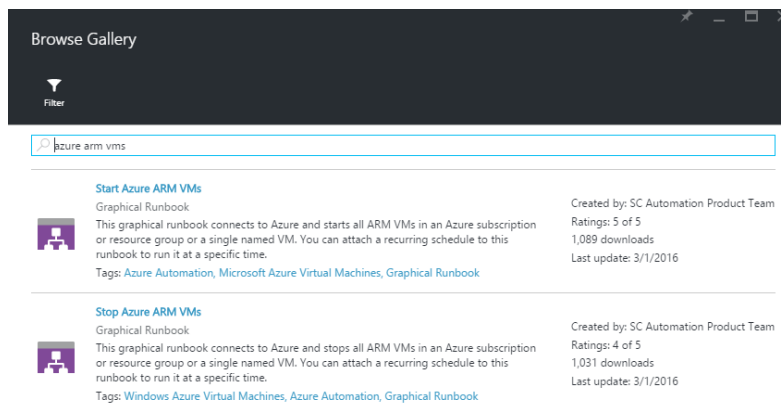

Now that the service principal has been given access to the subscription, an Automation Credential can be created.

From the Automation account blade, navigate to Assets then Credentials and click the "Add a credential" button. Enter your service principal details.
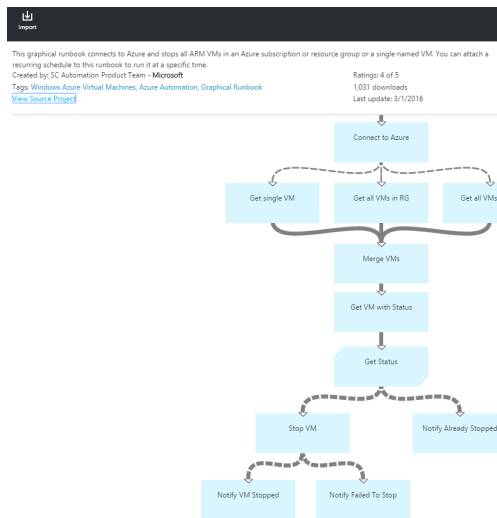

Time to create the Runbooks! From the Automation blade in the portal navigate to Runbooks then click the "Browse Gallery" button.
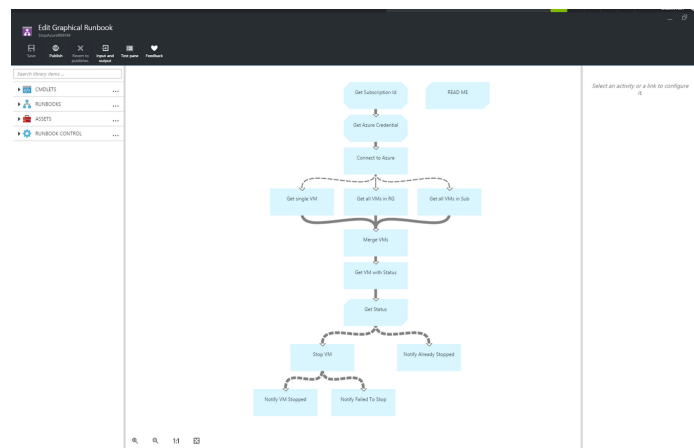We'll be using pre-existing graphical runbooks available in the gallery, built by the Automation product team. If you search for the text "azure arm vms" you'll see the two Runbooks we'll be using for this guide.

Contact the craftsmen about your cloud hosting and our specialised managed services: info@digitalcraftsmen.com or call on 020 3745 7706

Clicking on the "Stop Azure ARM VMs" brings up a view that shows the graphical runbook in all its glory.
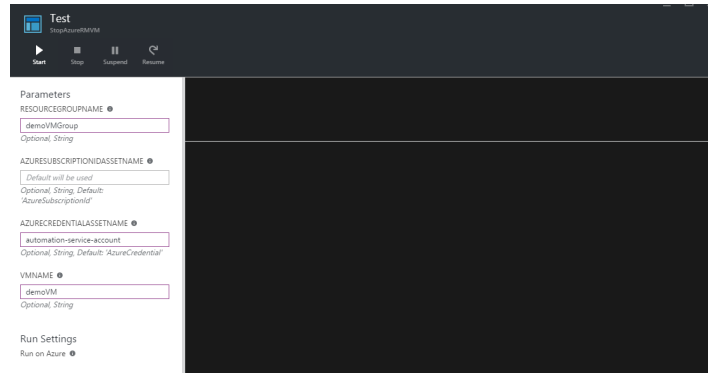

Clicking the "Import" button will bring this graphical runbook into your Automation account and allow you to alter, test and publish it.
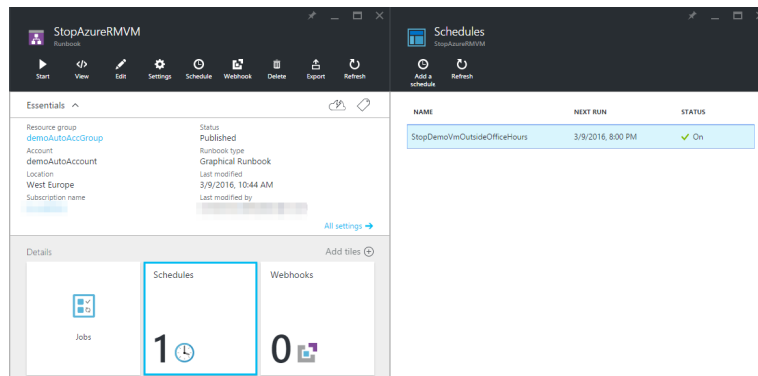

Clicking the "Test pane" button will allow you to fill in the parameters the runbook requires and start the runbook and see the output.
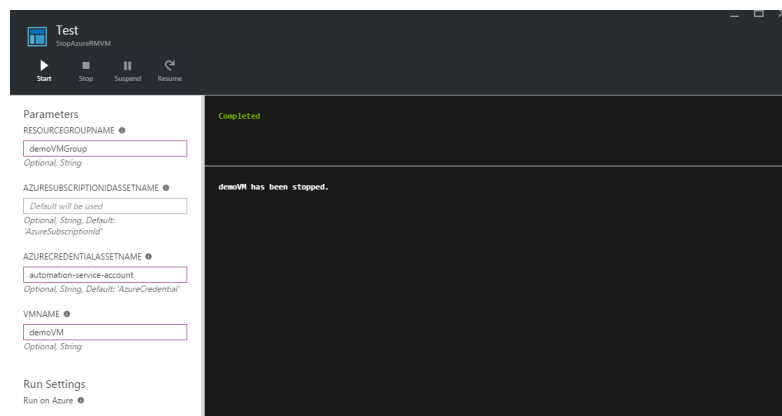The parameters this runbook needs are:
- Resource Group name
- Azure Subscription Id Asset name
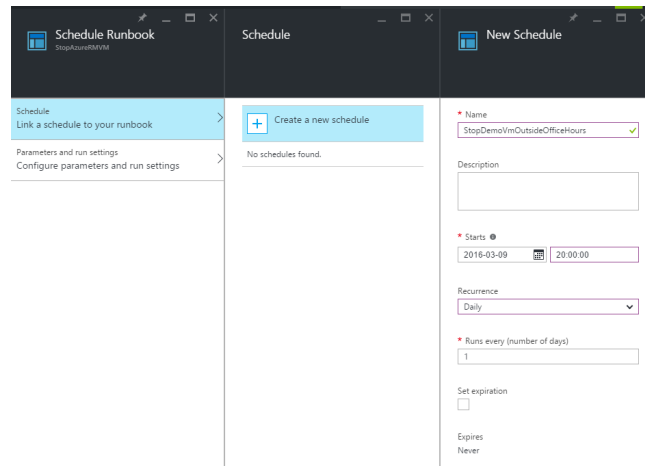- Azure Credential Asset name
- VM name

The Credential Asset was made in a previous step. You'll need to create a new Variable Asset for the Subscription ID.
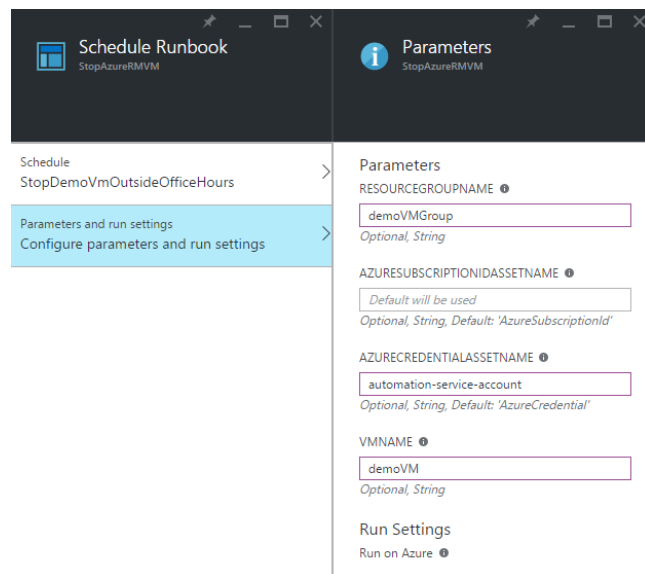

If you successfully enter the parameters and test the runbook, you should see output that says it is Completed and that the VM has been stopped.
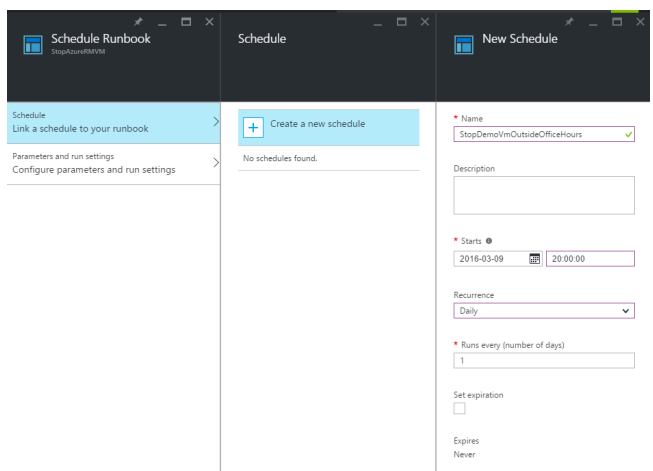
Once you've successfully tested the runbook, you can hit the "Publish" button.
Now that we have a published runbook to stop a virtual machine, we need to link it to a schedule, so the runbook starts automatically when we want it to.
From the Runbook blade, click the "Schedule" button, then "Add a Schedule". First you need to set up a schedule to link to this runbook. You can use an existing schedule or create a new one. When creating a new schedule you need to enter a name and when it should run e.g. daily at 20:00.
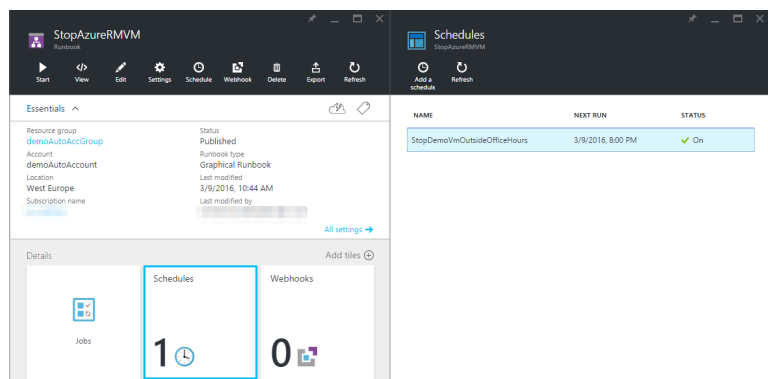

The parameters that will be given to the runbook on this scheduled run then need to be populated as well.

The parameters that will be given to the runbook on this scheduled run then need to be populated as well.

Once the schedule has been created, you'll see that schedule on the runbook blade.

We could now repeat all the steps to create a new runbook, but use the "Start Azure ARM VMs" graphical runbook from the gallery. In this way, we can schedule the VM to start and stop according to our needs.

Conclusion

By following this guide, we can use Azure Automation to cleanly shutdown virtual machines that aren't required after the end of the day, and then start them up before employees start the day.

This should also be a nice solution for those of you who are trying to squeeze as much as possible out of your monthly partner internal usage rights, free MSDN benefits, or an Azure subscription.

If you would like further information on Azure Power Automation, or if Digital Craftsmen can help you with automating your systems on any other platform, please get in touch.

Further Reading

- Microsoft Azure's guide on how to start/stop Virtual Machines during off-hours: https://docs.microsoft.com/en-us/azure/automation/automation-solution-vm-management
- Automys has a step by step guide on how to perform Azure Automation: https://automys.com/library/asset/scheduled-virtual-machine-shutdown-startup-microsoft-azure
- Petri also has a guide to Azure Automation, creating an Azure 'run book' by Automating the process: https://www.petri.com/azure-vm-startup-and-shutdown-using-azure-automation

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Why not talk to the Digital Craftsmen team about your cloud or hosting requirements? Our teams are cloud agnostic, which means our advice and recommendations are based on getting you the right cloud hosting and solutions for your needs.

We take a bespoke approach to each client, understanding that no two are alike, so why should your cloud be as well? The tailored approach is the smartest approach for businesses to take as it optimises the cloud experience and reduces costs.

Email us at info@digitalcraftsmen.com or call 020 3745 7706

Digital Craftsmen is fully ISO27001 and Cyber Essentials compliant and we manage an ITIL verified support desk.

Our latest ISO27001 2021 certification was awarded in recognition of the cybersecurity expertise, advice and managed services we bring to businesses operating in the remote working environment.

– ends –