Azure VMs: The File Copy Predicament

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Contents

Introduction

Unless you have been hiding in a cave for the last 5 years, you must have heard the word cloud. Today, it seems that cloud is a marketing term that is used for many things in the IT world. Unfortunately, because it is used everywhere, many people get confused about what it is and how it can benefit their organization.

The cloud has many definitions, and can be many different technologies. Depending on your exact needs, it can be something completely different for you compared to another IT professional that has other needs.

Personally, I like to work with the definition from the National Institute of Standards and Technology (NIST), which describes the characteristics, models and deployment models of a *cloud*. I call it the 5-3-4 Model. If you haven't explored the different cloud models yet, this document is a must-read.

In this white paper, we will discuss a problem (and a solution) that you might experience when using the public or hybrid cloud and, more specifically, Microsoft Azure Infrastructure-as-a-Service (IaaS) and deploying virtual machines (VMs).

Getting data in and out of a Microsoft Azure VM is not as easy as it might look. For years, we used to use Windows Explorer to copy files from machines to file servers or copy files between servers, without any issues. In the new era of cloud computing, it isn't that simple.

There are different methods to maneuver data in and out of a Microsoft Azure VM, but you will notice that most methods aren't that easy to use, bring challenges or simply have some limitations.

The lack of decent solutions for solving such day-to-day tasks is a true blocker for cloud adoption because it makes using these solutions difficult and time consuming. A simple way of getting configuration scripts or files to your freshly deployed virtual machine shouldn't cost you a lot of time or effort and neither should getting a copy or backup of the data your VM is collecting or generating back on site (for compliance, security or any other reason). Even a simple scheduling mechanism to copy data from an Azure VM to an onsite location (or vice versa) could add a great deal of value. Suddenly, what we've done for years becomes a problem in the new era of cloud computing.

Veeam® FastSCP™ for *Microsoft Azure* (free download at http://go.veeam.com/azure) is a free solution that overcomes these difficulties, challenges and limitations.

Possibilities

To show you different ways of maneuvering data with Azure VMs, let's take an in-depth look at the known methods. You will learn that while there are different approaches, most of them come with challenges or limitations, and you'll probably lose a lot of time on what should be a simple and trivial task.

Direct method

Some companies will use Microsoft Azure VMs as an extension to their data center. This means that the Azure VMs are domain-joined and connected to their own data center with a VPN, maybe even in combination with ExpressRoute.
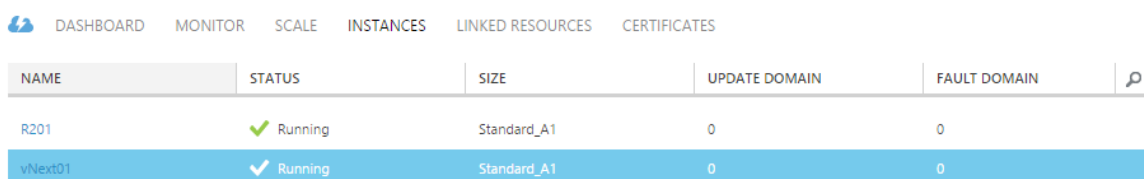
In that case, you will be able to copy/move data to those VMs without any issues because it's an extension of the data center. Since you will traversing the WAN, it won't be as fast as doing this locally, but that is expected.

Unfortunately, this scenario isn't always the case. Depending on the where you are using the services, it's possible that you won't be connected through VPN, or you might be in a situation where you cannot use that specific VPN. In that case, you can use other methods.

Through RDP

Another method is to copy the files through the RDP protocol. Simply go to your Microsoft Azure portal, select your VM and press the **connect** button to **_download_** an RDP file that you can use to connect to your VM.

Now, you have the ability to copy files from your local computer inside the VM over the RDP protocol.

While this method may seem simple, there are a few downsides. If you get disconnected from your RDP session or if there is a small interruption in the connection, you will need to restart. Additionally, if you need to copy data to multiple VMs, you will need to open different RDP sessions.

Finally, the RDP protocol has a limitation that does not allow you to copy files that are larger than 2 GB. On Windows Server 2012 and 2012 R2, you'll get a notification. However, previous versions won't notify you, and your copy job will suddenly stop.
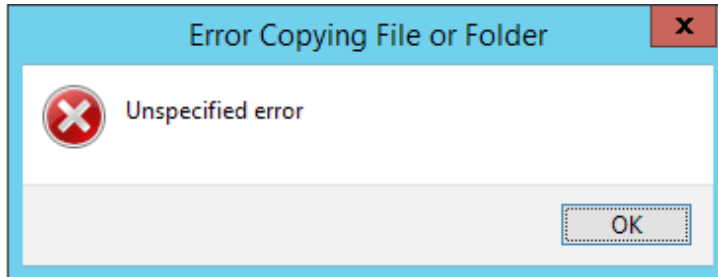
For more information about this issue, check out this KB:

https://support.microsoft.com/en-us/kb/2258090

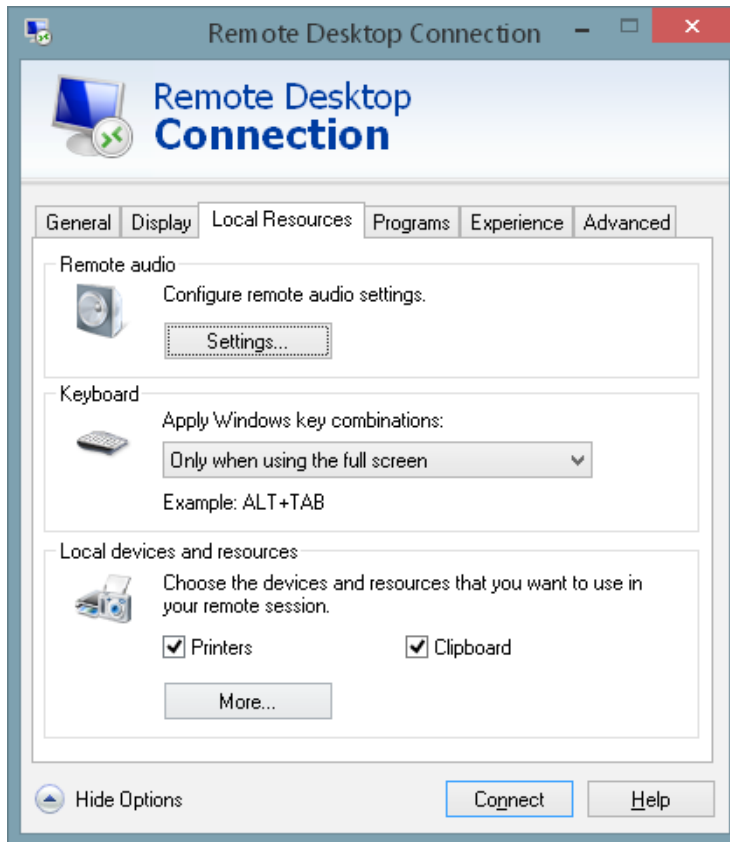There that allows you to get around the 2 GB limitation: You can modify the RDP file that you downloaded when you chose the **Connect** option.
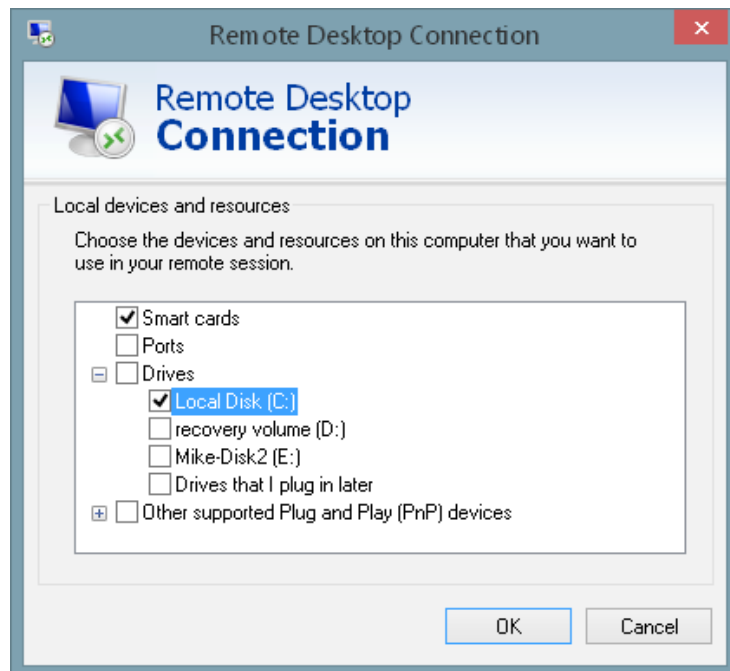
Right-click on that RDP file and choose **Edit.**
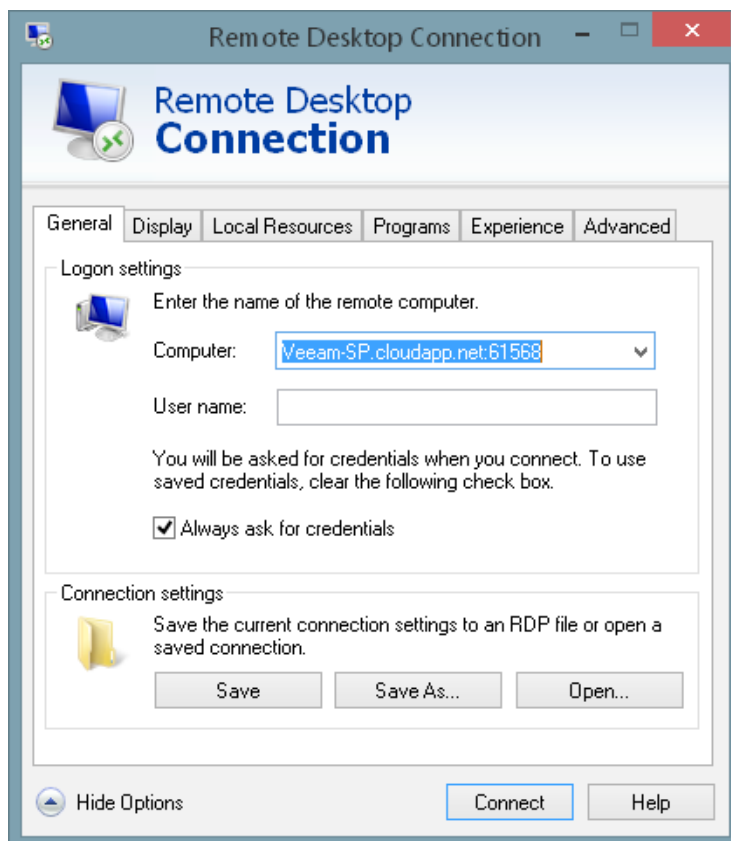
Go to the **Local Resources** tab and choose **More…** under the Local devices and resources section.

Select the device that you want to map to your remote session (in my case, I will select C: drive).

You will now be able to see that drive in Windows Explorer as a connected drive and start copying files. The advantage of this method is that it will get past this:
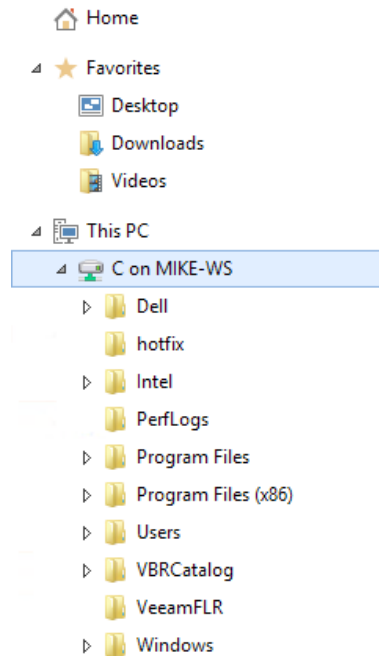
Attach a VM disk

You can also try creating an empty VHD disk on site and copy data onto that specific disk. Either you already have an empty VHD, but you can also use an existing one.

Making a VHD is simple. Go to **Administrative Tools → Computer Management →Disk Management**. Then, right click on **disk management** and select **Create VHD**. You MUST select VHD because VHDX is not available for use at this time in Microsoft Azure.
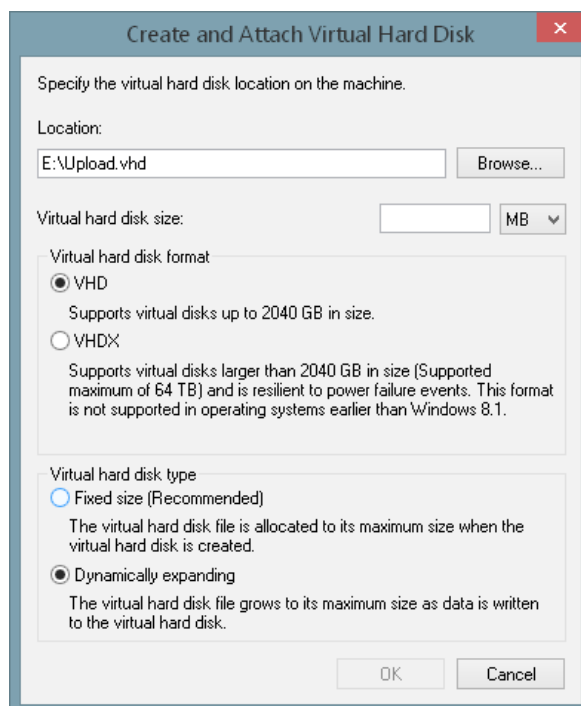
When you create a VHD, it will automatically attach to your computer, and you can initialize, format and assign a drive letter to it. Next time, you can use the **Attach VHD** command to make the VHD visible again. Now you can copy/move files and data to it.

Next, **upload the VHD to your Azure account**. You can find the details here: http://azure.microsoft. com/en-us/documentation/articles/virtual-machines-create-upload-vhd-windows-server/

As you might have noticed, this method requires some heavy use of PowerShell.

Next, you need to **attach the disk to your VM**. After that, you will be able to see it in Windows Explorer and get the files from there.

Done? Not quite — the VHD consumes a great deal of storage. Just leaving it there will trigger additional costs. Make sure you **detach the disk and delete it from your storage account** if you no longer need it.

While it is a solution to upload and download files, it isn't that easy-to-use and demands multiple handlings. Most of it can be automated though PowerShell, but it will still take a good amount time and effort.

FTP server

There is one more method, but it requires installation of a solution into your VM, which is probably something you don't want to do frequently. You **can install an FTP server** in the VM, and then **configure** it to use **passive mode** and a **single port range** (multiple-port range is possible, but that creates additional overhead). After that, you can **add** endpoints to the VM to open the firewall ports.

Next, you can **configure the FTP server** and use any FTP client to connect to the FTP server in the Azure VM.

Download the files

You can also download files from the Internet (think installer software), but this method doesn't always work. However, it might be the easiest to download it straight into the VM from Internet Explorer. Of course, this won't work for all types of files, and your configuration scripts, data, databases and so on probably won't be *published* on a web server for download.

Veeam FastSCP for Microsoft Azure

Is there a better solution? Yes, there is — **Veeam FastSCP** *for Microsoft Azure*.

Veeam FastSCP *for Microsoft Azure* is a standalone, free solution for copying data in or out of your Azure VMs.

With this solution, you can easily copy your files securely from on site to Azure VMs and from Azure VMs to on site. It also provides:

· **Secure file copy** with no independent encryption or VPN needed

· Manual file copy to/from Azure VMs **without the need to keep the UI open** until the file copy completes

· **Automatic scheduling of file copy jobs** for nightly or weekly copies to/from Azure VMs

· A wizard-driven UI to copy files in just a few clicks — with no scripting needed
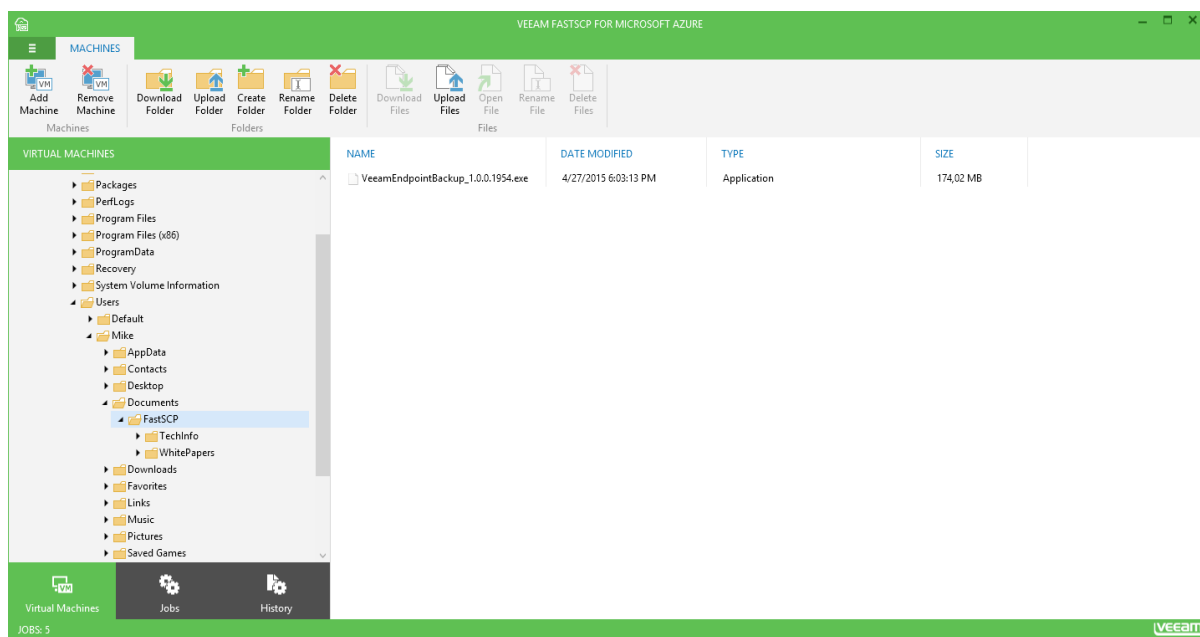
The solution itself is a small, easy-to-install program.

There is no need for any VPN or independent encryption. The data is transferred securely over HTTPS and uses remote PowerShell to connect to the VM.

Connecting to a VM is very simple:

In the menu bar, click on the **Add Machine** button

A new window will appear where you can **add your virtual machine**
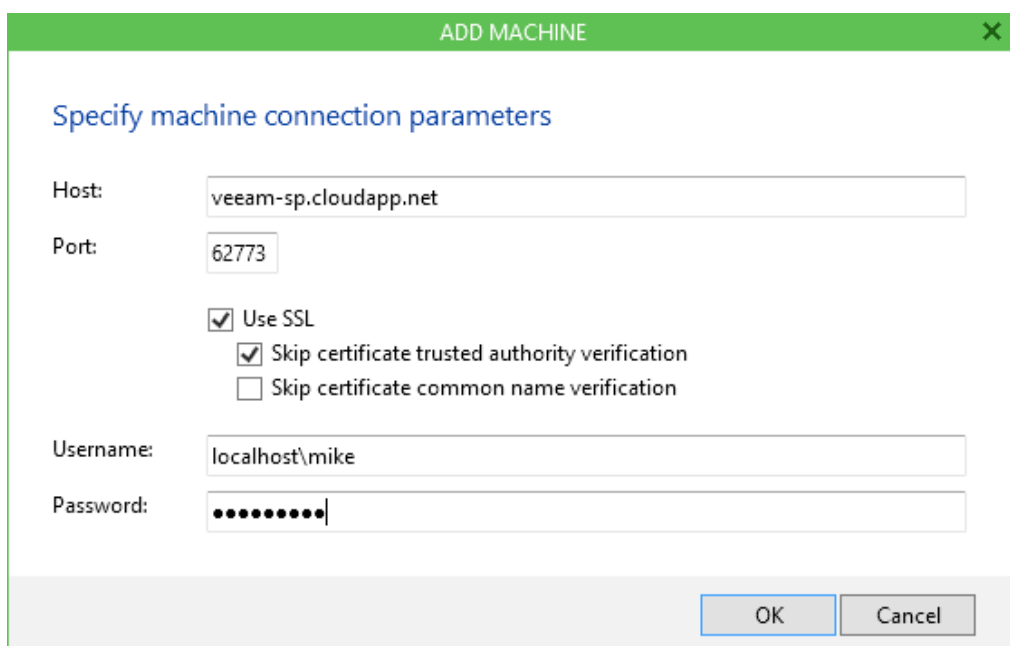
Add the hostname and specific port (Note: the default for the first VM in that cloud service is 5986 and can be retrieved by looking at the endpoints of that VM). Then, decide if you want to **use SSL and certificate behavior**. Next, **fill in the username and password** to connect to the VM.

After that, you can start using the tool for copying data and the solution offers two methods of doing so.

Manual

Veeam FastSCP *for Microsoft Azure* allows you to manually upload and download data.

You can download and upload complete folders or specific files. As you see in the ribbon, you can also create, rename and delete folders and also rename and delete files in that Azure VM.
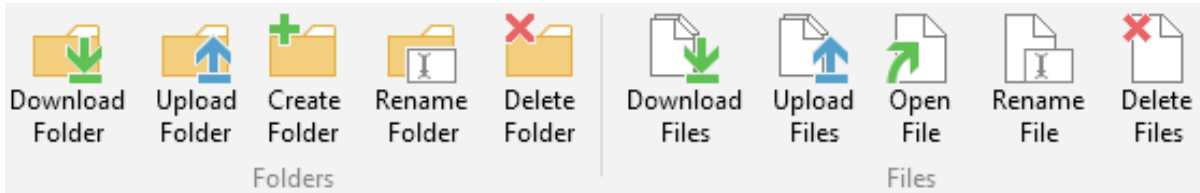
From the moment you select an option, a simple wizard will appear that allows you to select the folder and the destination (or vice versa) and the job will start.

You can follow the job in the Jobs tab, which we'll discussed later on.

You can also close the UI after you start the job. The data transfer will continue in the back.

Scheduled

You can also create scheduled jobs. This allows you to upload or download folders/files on a fixed schedule and it's fully automated. Jump to the **Jobs** tab to start creating scheduled jobs.
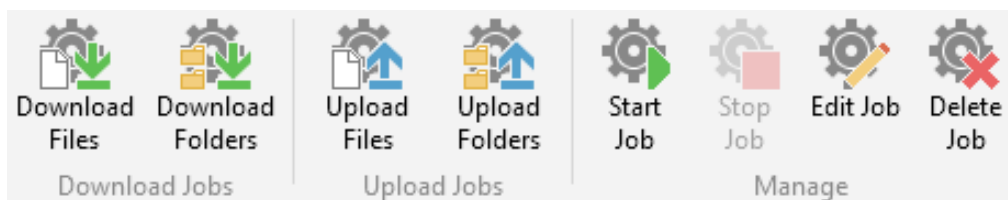
As you can see in the ribbon, there are multiple options. As an example, I'm going to create a download job that will download specific files on a regular basis.

The first window of the wizard gives you the opportunity to **type in the job name and a description**. The second window will allows you to **choose the objects** (files). You can add as many files as you want.
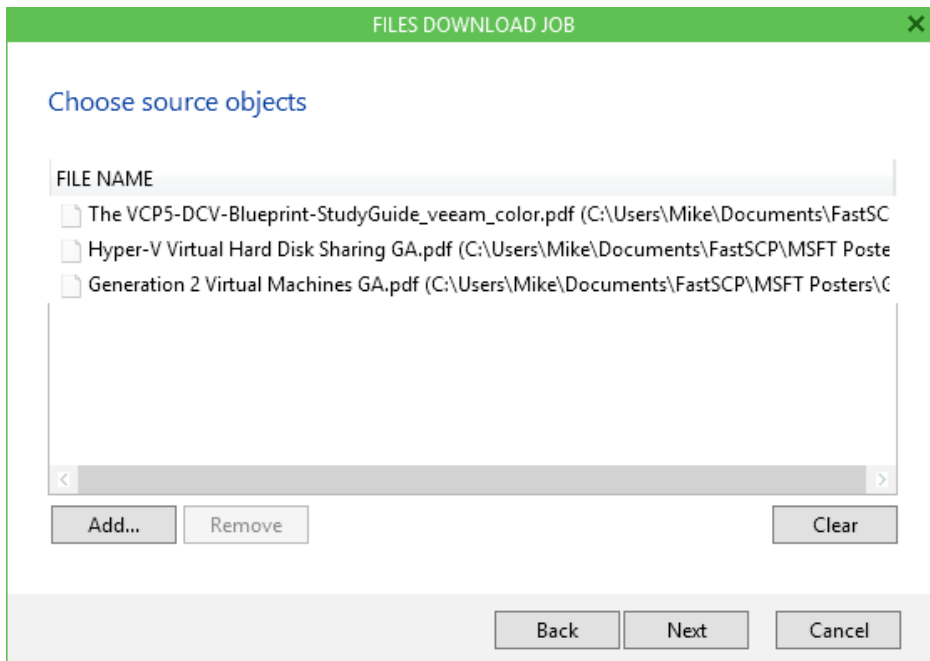
After that, you need to **specify your destination folder** on your onsite device and **set the job schedule**.
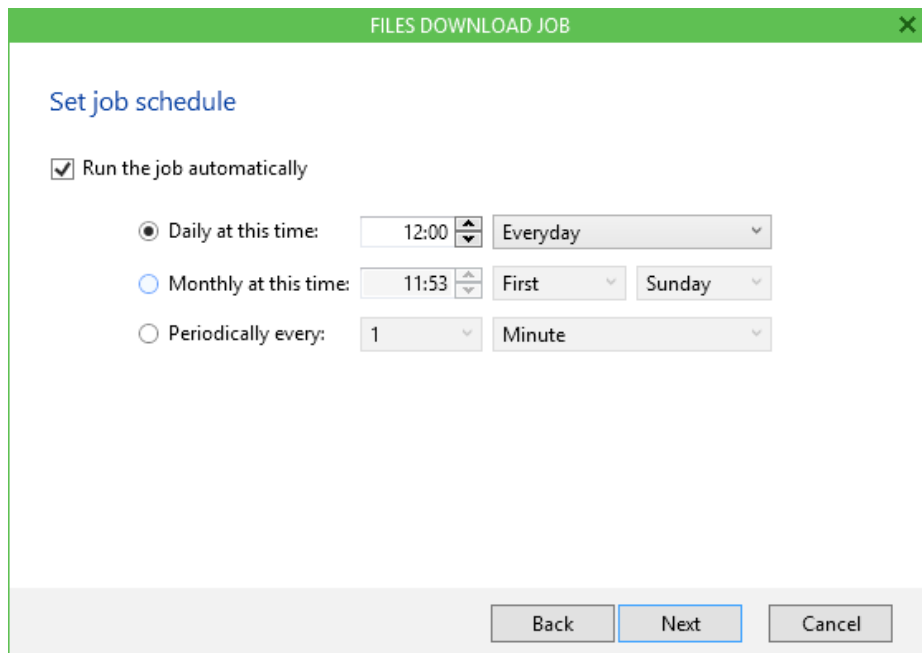
As you can see, you can use a daily schedule (or choose a specific date), choose specific days (first, second, third specific day and so on) or schedule it periodically.

Finally, you are able to **add pre- and post-PowerShell commands** to the scheduled job, which gives you additional options for getting data from running applications for example.

Click **Finish**, and now your job is scheduled.

You can run the job now (by selecting the **Start Job** button job in the ribbon) or let it run on the schedule.

Jobs tab

In the **Jobs** tab, you can review the jobs that have been running or are scheduled using different filters like download, upload, running, completed and failed in the last 24 hours.

You can get more information for each job such as the job name, type, status, details and next run time (if it is a scheduled job).

From here, you can also restart a job when you need to, even if it is a manual job.

JOB NAME	TYPE	STATUS	DETAILS	NEXT RUN TIME
Daily Download Tech Files	Download	Succeeded	Total: 321,66 MB. Rate: 373,99 KB/s.	28/04/2015 18:30
Download on 27/04/2015 at 18:02:24	Download	Succeeded	Total: 7,29 MB. Rate: 101,96 KB/s.	<not scheduled>
Upload on 27/04/2015 at 17:35:19	Upload	Succeeded	Total: 9,03 MB. Rate: 296,72 KB/s.	<not scheduled>
Upload on 27/04/2015 at 17:39:57	Upload	Succeeded	Total: 138,61 MB. Rate: 233,61 KB/s.	<not scheduled>
Upload on 27/04/2015 at 17:57:56	Upload	Succeeded	Total: 174,02 MB. Rate: 556,05 KB/s.	<not scheduled>
Upload on 28/04/2015 at 7:18:50	Upload	Running	6% completed at 607,5 KB/s	<not scheduled>

History tab

Finally, in the **History** tab, you can review your jobs and get specific information about them.

NAME	TYPE	RUN TIME	DURATION	RESULT	DETAILS
Job EMEA	Download	15/05/2015 12:00	13 seconds	Succeeded	Total: 1,94 MB. Rate: 143,04 KB/s.
Job APAC	Upload	15/05/2015 7:00	38 seconds	Succeeded	Total: 58,39 MB. Rate: 1,54 MB/s.
Job NA	Download	14/05/2015 18:45	34 seconds	Succeeded	Total: 9,85 MB. Rate: 294,76 KB/s.
Download on 14/05/2015 at 18:25:48	Download	14/05/2015 18:25	5 seconds	Succeeded	Total: 237,71 KB. Rate: 43,09 KB/s.
Upload on 14/05/2015 at 18:24:56	Upload	14/05/2015 18:24	41 seconds	Succeeded	Total: 58,39 MB. Rate: 1,39 MB/s.
Job #1	Download	14/05/2015 17:30	22 seconds	Succeeded	Total: 7,29 MB. Rate: 332,91 KB/s.
Job EMEA	Download	14/05/2015 12:00	13 seconds	Succeeded	Total: 1,94 MB. Rate: 142,18 KB/s.
Download on 14/05/2015 at 11:24:23	Download	14/05/2015 11:24	13 seconds	Succeeded	Total: 1,94 MB. Rate: 143,78 KB/s.
Upload on 14/05/2015 at 11:23:35	Upload	14/05/2015 11:23	10 seconds	Succeeded	Total: 2,69 MB. Rate: 263,54 KB/s.
Job APAC	Upload	14/05/2015 7:00	39 seconds	Succeeded	Total: 58,39 MB. Rate: 1,49 MB/s.
Download on 14/05/2015 at 6:24:55	Download	14/05/2015 6:24	7 minutes, 51 sec	Succeeded	Total: 330,17 MB. Rate: 717,28 KB/s.
Upload on 14/05/2015 at 6:24:06	Upload	14/05/2015 6:24	13 seconds	Succeeded	Total: 1,94 MB. Rate: 144,49 KB/s.
Job #1	Download	13/05/2015 17:30	30 seconds	Succeeded	Total: 7,29 MB. Rate: 246,09 KB/s.
Job #1	Download	12/05/2015 17:30	21 seconds	Succeeded	Total: 7,29 MB. Rate: 340,55 KB/s.
Download on 30/04/2015 at 14:20:45	Download	30/04/2015 14:20	22 seconds	Succeeded	Total: 7,29 MB. Rate: 326,05 KB/s.
Upload on 30/04/2015 at 14:18:25	Upload	30/04/2015 14:18	2 seconds	Succeeded	Total: 19,69 KB. Rate: 7,12 KB/s.
Daily Download Tech Files	Download	29/04/2015 18:30	3 hours, 4 minute	Succeeded	Total: 10,65 GB. Rate: 1008,64 KB/s.
Upload on 29/04/2015 at 14:59:09	Upload	29/04/2015 14:59	1 hour, 5 minute:	Succeeded	Total: 10,00 GB. Rate: 2,60 MB/s.
Upload on 29/04/2015 at 10:13:30	Upload	29/04/2015 10:13	1 hour, 4 minute:	Succeeded	Total: 10,00 GB. Rate: 2,64 MB/s.
Daily Download Tech Files	Download	28/04/2015 18:30	23 minutes, 47 se	Succeeded	Total: 666,19 MB. Rate: 477,72 KB/s.
Download on 28/04/2015 at 17:33:57	Download	28/04/2015 17:33	9 minutes, 1 seco	Succeeded	Total: 330,17 MB. Rate: 624,04 KB/s.
Upload on 28/04/2015 at 17:33:07	Upload	28/04/2015 17:33	29 seconds	Succeeded	Total: 10,35 MB. Rate: 356,29 KB/s.
Upload on 28/04/2015 at 16:28:06	Upload	28/04/2015 16:28	6 seconds	Succeeded	Total: 699,52 KB. Rate: 113,12 KB/s.
Download on 28/04/2015 at 11:32:03	Download	28/04/2015 11:32	8 minutes, 53 sec	Succeeded	Total: 330,17 MB. Rate: 634,09 KB/s.
Upload on 28/04/2015 at 11:31:22	Upload	28/04/2015 11:31	10 seconds	Succeeded	Total: 3,33 MB. Rate: 316,88 KB/s.
Upload on 28/04/2015 at 7:18:50	Upload	28/04/2015 7:18	9 minutes, 28 sec	Succeeded	Total: 330,17 MB. Rate: 595,10 KB/s.
Daily Download Tech Files	Download	27/04/2015 18:30	14 minutes, 40 se	Succeeded	Total: 321,66 MB. Rate: 373,99 KB/s.

Scenarios solved…

Veeam FastSCP *for Microsoft Azure* is a potential time-saver and can solve many scenarios in your environment. Let's describe a few of them:

- **Customizing VMs running in Microsoft Azure**

When you deploy a VM from an image, it is a deployed as a base image. Your company might have specific deployment settings and scripts to adjust the VM to match your needs. Simply upload those scripts and configuration settings after the deployment, and you can adjust the base image to your own needs. And with the post-commands, you can even automate the start of the adjustments after the upload. This will make it much easier to ensure that your VMs are deployed according to your needs and standards.

Developers could also use this feature to easily customize the applications they're developing by uploading customization scripts, configuration files and data to have better testing results.

- **Updating application data**

Nightly uploads of data (like for example daily CMDB data dumps) allow the IT professional or developer to have current data on Azure VMs or back on site. For testing purposes, this means it will have real-world data. For production environments, it is an efficient way of keeping the data that you are working on up-to-date, with a *backup* on site.

- **Download usage data or log files**

Whether it is a production environment or a dev/test/acceptance environment, having an easy way of downloading usage data and log files for further investigation or compliance reasons makes developers and IT professionals very happy.

- **Copy database data**

Using Veeam FastSCP *for Microsoft Azure*, you can get database data and a copy of your running database on site.

- **Basic periodic file-level backup**

You'll also be able to get certain, specific files (data, config, etc.) on site on a regular basis.

More scenarios?

Veeam FastSCP for Microsoft Azure can address many more scenarios, but describing them all would be a lengthy task.

Conclusion

Veeam FastSCP *for Microsoft Azure* solves the problem of uploading data from on site to Azure VMs and vice versa. Through a natively secure file copy, with no VPN needed, you can upload or download your data fast and easy while built-in compression reduces bandwidth requirements in many cases. You can even schedule download and upload jobs with no scripting skills required — everything is done through a simple, wizard-driven UI.

The solution (currently in beta) is available at http://go.veeam.com/azure.html

About the Author

Mike Resseler is a Product Strategy Specialist for Veeam. Mike is focused on technologies around Hyper-V and System Center. With years of experience in the field, he presents on many occasions at large events such as MMS, TechEd and TechDays. Mike has been awarded the MVP for System Center Cloud and Datacenter Management since 2010. His major hobby is discussing and developing solid disaster recovery scenarios. Additionally, he has enterprise-class experience in private cloud architecture and deployment, with marked focus on protection from the bottom to the top. He holds certifications in many Microsoft Technologies such as MCITP.

Follow Mike on @MikeResseler or @Veeam and on Google+.

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Veeam® recognizes the new challenges companies across the globe face in enabling the Always-On Business™, a business that must operate 24/7/365. To address this, Veeam has pioneered a new market of *Availability for the Modern Data Center*™ by helping organizations meet recovery time and point objectives (RTPO™) of less than 15 minutes for all applications and data, through a fundamentally new kind of solution that delivers high-speed recovery, data loss avoidance, verified protection, leveraged data and complete visibility Veeam Availability Suite™, which includes Veeam Backup & Replication™, leverages virtualization, storage, and cloud technologies that enable the modern data center to help organizations save time, mitigate risks, and dramatically reduce capital and operational costs.

Founded in 2006, Veeam currently has 29,000 ProPartners and more than 135,000 customers worldwide. Veeam's global headquarters are located in Baar, Switzerland, and the company has offices throughout the world. To learn more, visit http://www.veeam.com.