VEEAMON2019

Automate Yourself Out of a Backup Job: Advanced PowerShell and API Usage

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Agenda

What are we really talking about?
Why we should automate
New PowerShell features in U4
API 101 & Veeam API specifics
Walkthrough of an API workflow
PowerShell and API demos

Takeaways:
Capabilities of U4 PowerShell cmdlets
Basics of Veeam APIs
Example workflow & demo code to start your exploration
The chance to hang out with me

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Begin with a plan

Know your capabilities

Veeam® components

Virtual environment and agents

Veeam Backup *for Microsoft Office 365* and Veeam Availability Orchestrator

Staged Restore, Secure Restore and Explorers

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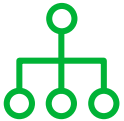
Defining success for your organization

Plan first

Speed or performance is not the point



Standardize, validate and repeat

MVP: “Minimum viable product”

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Defining success of Availability

- Before you code, define a goal. Think tasks and measurable results.
- In this context, automation isn't solely about speed or performance.
- Are you automating for the benefit of the business?
- Focus on standardization, validation and efficiencies gained.
- Use small, incremental changes that can be verified.

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Veeam and PowerShell Basics

PowerShell basics

Get-Help is your friend and will make your life easier.

PowerShell is built for pipeline. Embrace and use it.

Stack cmdlets and results are like Legos.
(i.e., buy a set if you are outdated on the concept)

Forget what your teachers told you:
Cheat or look up the answer whenever possible.

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Veeam PowerShell tips

Search Veeam cmdlets specific to your version:
Get-VBRCommand [-V95] [-V90] [-V80]

What is your type? What are your members?

Now that you know your type, where can it be used?
Get-Command -ParameterType *TypeName*

A little bit of validation — understand the allowed values of parameters:
Look up the Veeam PowerShell enumerations

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Starting at the beginning

Step 1	Step 2	Step 3
Start-VBRConfigurationBackupJob	What are you trying to accomplish? Think MVP.	Add-PSSnapIn VeeamPSSnapIn

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Full infrastructure deployment

Fully automated Veeam installs and upgrades
https://github.com/VeeamHub/powershell/tree/master/BR-UnattendedInstall

Fully automated Veeam deployment and configuration
Simple: My VeeamON 2018 deployment example; 22 lines of code
Deploy Windows Proxy/Repository, connects vCenter, creates backup job (VM tag), assigns daily schedule
https://www.fullstackgeek.net/veeamon2018_automate-yourself-out-of-a-backup-job/

Advanced: Automated deployment of Veeam on VMware with Veeam Linux Repo connected by Veeam PN
Deploy and install Veeam Backup & Replication™ 9.5 Update 4 components on a new VM from Template (Chef) and Terraform, AWS VPC for Veeam Linux Repo and Veeam PN Sitegateway (Terraform), local Veeam Linux Repo
https://github.com/VeeamHub/automation/tree/master/deploy_veeam_sddc_toolkit

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OK, so now what?

Creating jobs targeting objects:

- Hosts, clusters, VMs, templates, datastores, res. pools, tags (VMware)
- Hosts, VMs, volumes (Hyper-V)
- Windows Agent – VBR managed (server, WSFC); agent managed (workstation, server)
- Linux Agent – VBR managed (server); agent managed (workstation, server)

Setting Job Options:

- Scheduling, active/synthetic full schedule, retention of deleted VMs
- Application aware (per VM) – VSS, transaction logs, SQL/Oracle, file exclusions, specific credentials, pre-freeze & post-thaw script options
- Pre & post job script options, job notifications

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Tips for Job Management

Leverage vSphere tags for job object selection

Automation allows you to easily build new jobs to match templates and schedules

Prebuilt jobs & vSphere tags make your jobs run as a subscription model!

VeeamOne Business View builds vSphere tags based on multiple conditions

Consider a ‘No Backup’ tag for workloads needing exclusion or no backups

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Setting advanced options

Method 1: Native Veeam cmdlets:

- Set-VBRJobAdvancedOptions
- Set-VBRJobAdvancedBackupOptions
- Set-VBRJobAdvancedStorageOptions
- Set-VBRJobAdvancedViOptions
- Set-VBRJobAdvancedNotificationOptions

Method 2: No parameter for Set-VBRJobAdvanced* cmdlet

```
$JobOptions = New-VBRJobOptions -ForBackupJob

$JobObjectVSSOptions = New-VBRJobVssOptions -ForObject
```

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Automating with Update 4

Expanded PowerShell coverage Veeam Agents

Veeam Availability Suite™ Update 4 now allows PowerShell coverage for Veeam Agents:

- Agent protection scopes
  Targeting AD containers/CSV files for dynamic deployment
- Agent protection groups
  Deployment schedules/options, network usage and security
- Agent backup schedule and scope
  Creation of agent backup jobs managed by backup and replication
- Agent storage and backup options
  Compression, block-size and encryption, as well as full and synthetic full scheduling

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Expanded PowerShell coverage Veeam Explorers

Update 4 includes PowerShell coverage for Veeam Explorers™:

Veeam Explorer *for Microsoft SQL Server*

Veeam Explorer *for Microsoft Exchange*

Veeam Explorer *for Microsoft OneDrive*

Veeam Explorer *for Microsoft SharePoint*

Veeam Explorer *for Oracle*

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PowerShell Demos

API 101 & Veeam APIs

API Basics – (Application Programming Interface)

REST – REpresentational State Transfer

Architectural style based on HTTP protocol and Uniform Resource Identifiers (URI) standards

Client & server model, independent of each other, modular and stateless

Allows access & manipulation of text representations of resources

Uses uniform & predefined HTTP methods – GET, POST, PUT, PATCH and DELETE)

Perform CRUD operations – create, read, update and delete

GET, PUT and DELETE methods are idempotent (result is same state on server no matter how many times same request is executed)

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API Tools

Short list of tools based on browser/platform:

Chrome – Postman or Restlet Client

Firefox – RESTClient or RESTed

Windows – Postman, Insomnia, Advanced REST Client

Mac – Postman, Insomnia, Paw

Product Specific – Swagger (if provided)

Command Line – PowerShell or CURL

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Veeam Products with API coverage

Veeam Backup & Replication
(via Veeam Backup Enterprise Manager)

Veeam Backup *for Microsoft Office 365*

Veeam Availability Orchestrator

Veeam Availability Console

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Getting Started with Veeam APIs

- Veeam Backup Enterprise Manager API for Veeam Backup & Replication
  https://helpcenter.veeam.com/docs/backup/rest/overview.html
  XML or JSON, not Swagger-compliant API, XSD (XML schema doc)

- Veeam Backup *for Microsoft Office 365* API
  https://helpcenter.veeam.com/docs/vbo365/rest/overview.html

- Veeam Availability Orchestrator API
  https://helpcenter.veeam.com/docs/vao/restapi/overview.html

- Veeam Availability Console API
  https://helpcenter.veeam.com/docs/vac/rest/overview.html
  VBO, VAO, VAC: JSON, Swagger built-in, API concurrent design model

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Being Effective with the EntMgr API

- Read the "Getting Started" and "Sample Scenarios" sections of API docs
- Understand structure, content and semantics of elements and types

  %Program Files%\Veeam\Backup and Replication\Enterprise Manager\schemas\RestAPI.xsd
- Perform Enterprise Manager actions (start/stop/retry of VBR/agent jobs)
- Easily perform 1-click file/folder or full VM restore
- Hugely powerful for reporting on jobs and backups
- Connect to latest version (/api/sessionMngr/?v=latest)

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Example Workflow with Veeam API

Quick backup & restore workflow

- Running a quick backup and quick restore via API
- Leveraging “quick backup” and “quick rollback” actions for a VM
- Imagine a backup/test/refresh scenario for test/dev or lab

What this exercise should show:

- How to understand the API documentation and navigate the API
- Walkthrough of how to use the API to get specific information
- Performing these basic functions through the API

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Planning for quick backup & restore

What method will perform a "quick backup"?

(POST) /backupServers/{ID}?action=quickbackup

What details do we need for backup?

Backup Server ID & VmRef

What method will perform a full VM restore?

(POST) /vmRestorePoints/{ID}?action=restore

What details do we need for restore?

ID of restore point

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Finding our VM details

We could construct the “HierarchyObjRef” details:

According to docs, need platform, type, HierarchyRootId, ObjectRef

End Result is:

urn:<Platform>:<Type>:<HierarchyRootId>.<ObjectRef>

We can gather this information from the docs:

urn:VMware:VM:<HierarchyRootId>.<ObjectRef>

Instead, let's just look up the VM ID

(Because I'm efficient/lazy)

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How to look up the VM ID

First let's search for our HierarchyRootId of vCenter

Now we have our Backup Server ID and HierarchyRootId

Backup Server ID: 4eca212a-e998-47cb-b8ac-8d68f43b97d0

vCenterHierarchyRootId: fdd958d1-0a04-410a-964f-0f8f9c13a5fe

Let's take that HierarchyRootId and look up its VMs

We now have the VM object reference of:

urn:VMware:Vm:fdd958d1-0a04-410a-964f-0f8f9c13a5fe.vm-11388

(Again, because I'm efficient/lazy)

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Taking our quick backup

What method will perform a "quick backup"?

(POST) /backupServers/{ID}?action=quickbackup

We now have the VM object reference of:

urn:VMware:Vm:fdd958d1-0a04-410a-964f-0f8f9c13a5fe.vm-11388

What does out POST method look like:

(POST) /backupServers/4eca212a-e998-47cb-b8ac-8d68f43b97d0?action=quickbackup

We need to format the body as:

```
<QuickBackupStartupSpec>
 <VmRef>urn:VMware:Vm:fdd958d1-0a04-410a-964f-0f8f9c13a5fe.vm-11388</VmRef>
</QuickBackupStartupSpec>
```

Now let’s run it

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Restoring that backup

Now that someone has done some work (or broken) this VM, let's restore it back

What method will perform a full VM restore?

(POST) /vmRestorePoints/{ID}?action=restore

What details do we need for restore?

ID of restore point

Let’s demonstrate how to navigate the API and then run this in Postman

That’s it… our restore is underway

This was a simple demo meant to show how you can discover the API, but you may want to code functions to make them easier to run

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Veeam API Demos

Community Projects

Community projects (Veeam API-based)

*These are unsupported products/projects

Self-service:

Veeam Backup *for Microsoft Office 365* self-service web portal

https://github.com/VeeamHub/vbo365-rest-self-service

Dashboards:

Veeam Backup *for Microsoft Office 365*

http://bit.ly/jdelacruz-veeamO365

Veeam Availability Console

http://bit.ly/jdelacruz-veeamvac

Android apps:

Weeatcher

https://weeatcher.github.io

vCoffee

https://github.com/VeeamHub/vCoffee

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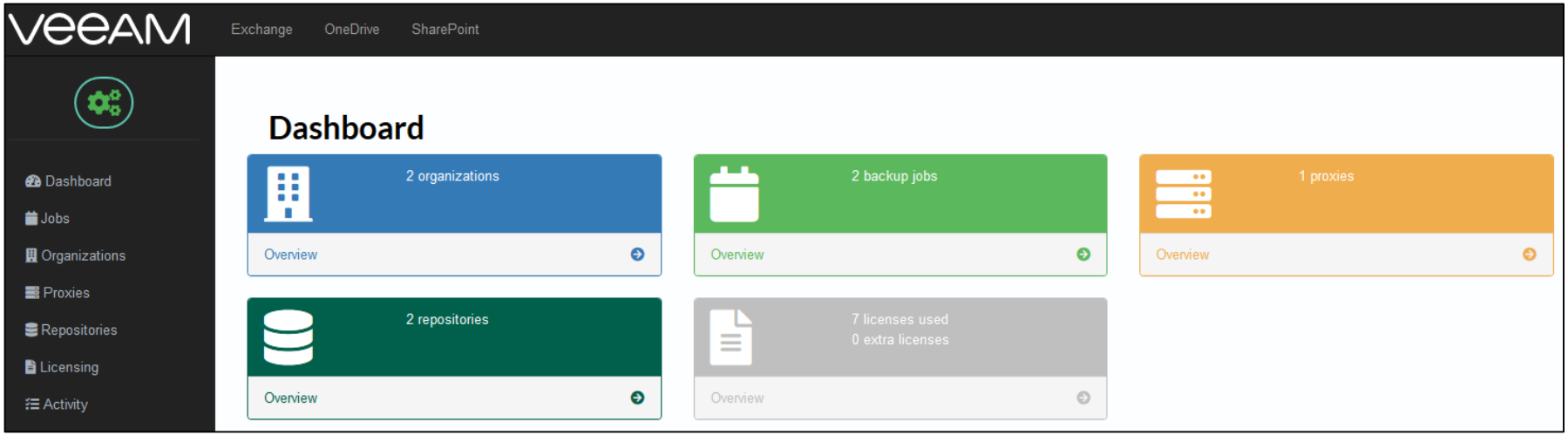
Veeam Backup
for Microsoft Office 365 self-service



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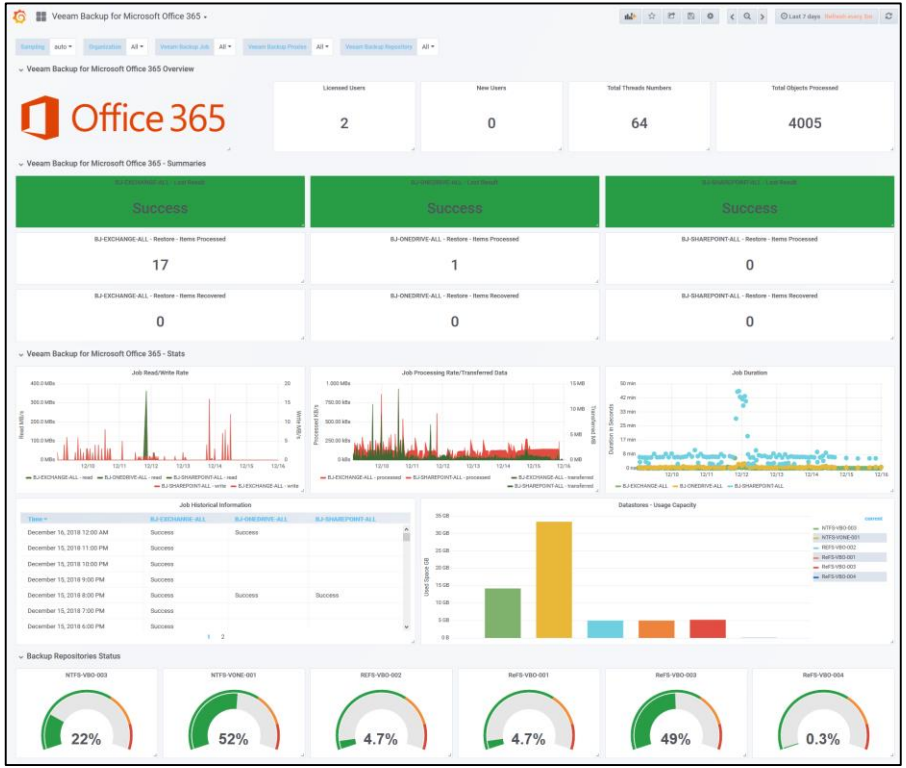
Veeam Backup
for Microsoft Office 365 dashboard



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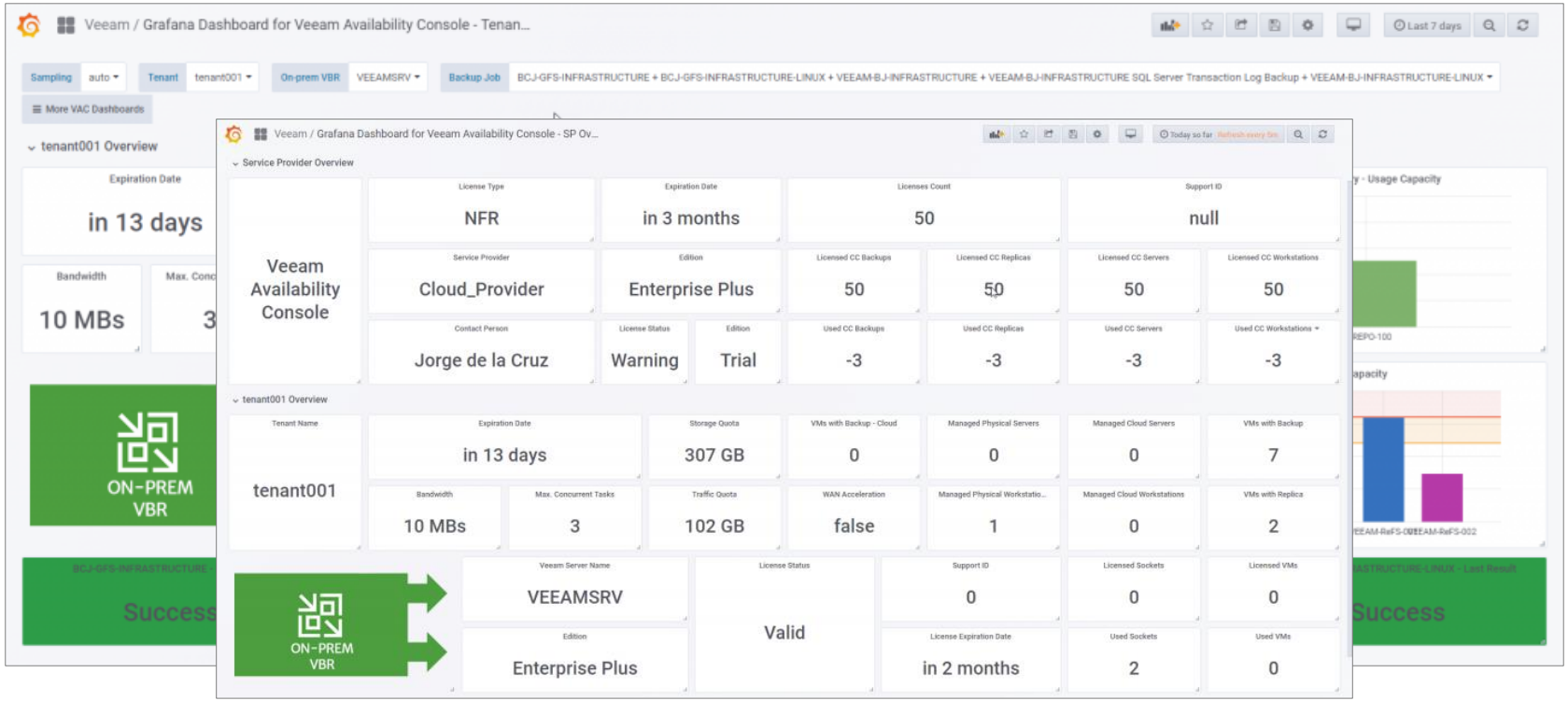
Veeam Availability Console dashboard



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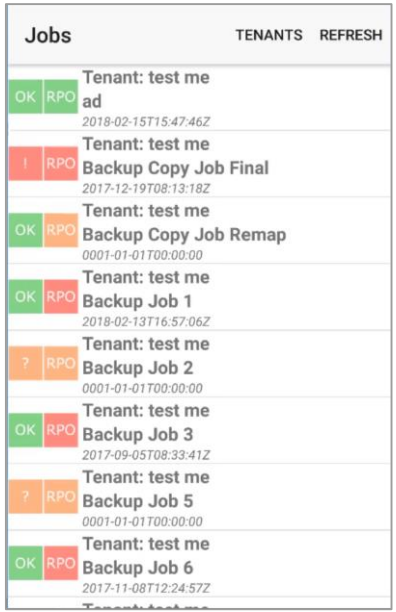
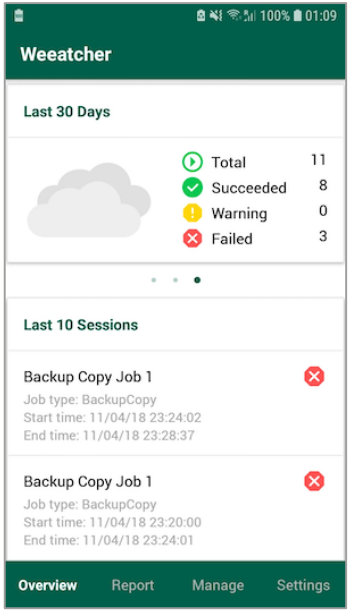
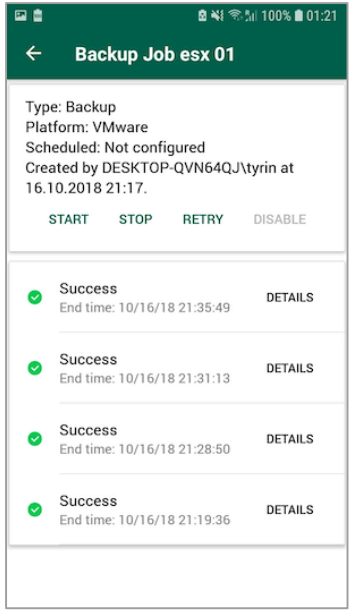
Android apps

vCoffee



Weeatcher





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Wrapping it up

PowerShell Resources

PowerShell types:

https://helpcenter.veeam.com/docs/backup/powershell/veeam_powershell_types.html

PowerShell enumerations:

https://helpcenter.veeam.com/docs/backup/powershell/enums.html

Veeam community :

https://github.com/VeeamHub/powershell

Veeam configurations:

https://www.fullstackgeek.net/veeamon2018_automate-yourself-out-of-a-backup-job/

https://github.com/VeeamHub/automation/tree/master/deploy_veeam_sddc_toolkit

Handy PowerShell scripts:

https://www.powershellgallery.com/packages/PowerShellCookbook/

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API Resources

Veeam EM API Resource Types, URLs, Representations, and Links

https://helpcenter.veeam.com/docs/backup/rest/resources.html

Veeam EM API Web Client:

https://helpcenter.veeam.com/docs/backup/rest/em_web_api_client.html

Veeam EM API Workflow:

https://helpcenter.veeam.com/docs/backup/rest/emr_web_api_workflow.html

Veeam EM API Sample Scenarios:

https://helpcenter.veeam.com/docs/backup/rest/sample_scenarios.html

Zapier API 101 Book:

https://zapier.com/learn/apis/

REST API 101:

https://medium.com/becloudy/rest-api-101-e022b6f6ae78

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Q & A

Thank you!
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