EXPLORE

RVTools and ollama

VMware {code} Hackathon

#vmwareexplore #vmwarecode #hackathon

Team Description:

Use RVTools data with ollama to find inconsistences in configurations

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Hackathon Team	
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Don Horrox	Moffitt Cancer Center
Amos Clerizier	Moffitt Cancer Center
Brian Haskell	AMS
Adrian Ayran	Virtua Health

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Hackathon Team Goals:

- Keep it simple!
- Use AI to review RVTools generated data. RVTools is available to everyone to use
  - Use the csv or the xlsx files
- Create a PowerShell script that a VMware Admin could run against the RVTools files that they already generate
- Use a Local AI so that data is not sent to an AI provider
- VMware Admins use PowerCLI for Automation. Use PowerShell to work with the AI APIs.
- Generate html files from the findings that could be added to an VCF Operations Dashboard
- Use GitHub to share info before the Hackathon
  - Discussions within GitHub made it nice to do everything in my location

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What the Hackathon Team Discovered:

- AI is not magic
- Standalone ollama doesn’t work well with csv files without using a RAG solution or something that works with data
- Better results using the PSAI PowerShell Module with OpenAI
- Better results converting the csv files to json when using with OpenAI
    - When data was in json format, more accurate with numeric values
- RVTools uses the same column name more than one time within a worksheet
    - Had to create code to rename 2nd occurrence of column name
- ChatGPT client (local or web) and the RVTools xlsx file worked OK to have something that required zero programming. Upload file and prompt. You can create a private GPT within ChatGPT to do this and have a set of pre-defined prompts.
- If someone wanted to use ChatGPT without sending VM names or other sensitive information, they could implement a data masking process, de-identify the data, to obscure the names before inputting the data. Once ChatGPT has processed the data, the correct VM names can be restored afterward. Team has a script to show how this works.

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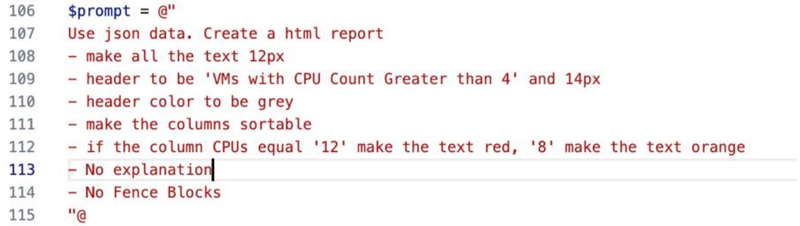
What the Hackathon Team Discovered:

- Prompt Splatting makes it easier to read the code



```
$prompt = @"
Use json data. Create a html report
- make all the text 12px
- header to be 'VMs with CPU Count Greater than 4' and 14px
- header color to be grey
- make the columns sortable
- if the column CPUs equal '12' make the text red, '8' make the text orange
- No explanation
- No Fence Blocks
"@
```

- Make AI as easy to use as PowerCLI and adoption will increase
- Ollama did not work without RAG for CSVs but works great for code creation
    - vscode + continue extension + ollama + llama3
- Local GPTs tested:
    - Open WebUI, Enchanted, AnythingLLM
- AI does a good job creating the HTML report files with zero programming

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What the Hackathon Team Discovered:

Here are some RVTools prompt ideas:

Hosts

- Count the number of CPU cores per Datacenter and per cluster (think of customers assessing VCF for the first time)
- Identify CPU models which are different from others in the same cluster.
- Identify hosts with CPU Usage % over 70%.
- Identify hosts with Memory Usage % over 70%.
- Identify hosts with more than 60 running VMs each.
- Identify hosts with different ESXi versions in the same cluster.
- Identify hosts with configured NTP servers which do not match the others.
- Identify hosts with different hardware models in the same cluster.

VMs

- Count the number of VMs powered on/off.
- Count the number of VM Templates.
- Identify VMs configured with more than 16 vCPU and/or 16 GB of Memory.
- Identify VMs with CPU Ready % above 0%.
- Identify VMs where Secure Boot is not enabled.
- Identify VMs where the BIOS type is not EFI.
- Identify VMs with hardware version <19.
- Count number of VMs per Datacenter and Cluster.
- Identify VMs with less than 2 vCPU and/or 8 GB of Memory.

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Screen Shots

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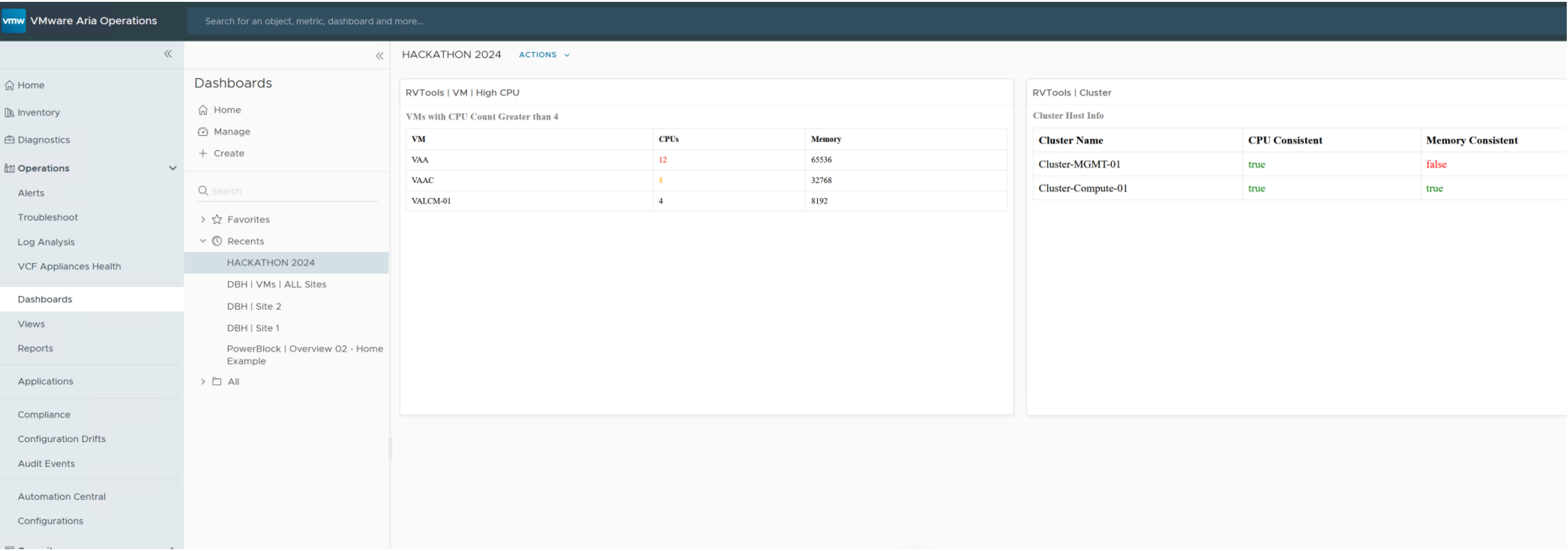
VCF Operations Dashboard with AI Generated Reports:

End Results, Show the AI created Reports in Operations as a Dashboard.



RVTools | VM | High CPU

VMs with CPU Count Greater than 4

VM	CPUs	Memory
VAA	12	65536
VAAC	8	32768
VALCM-01	4	8192

RVTools | Cluster

Cluster Host Info

Cluster Name	CPU Consistent	Memory Consistent
Cluster-MGMT-01	true	false
Cluster-Compute-01	true	true

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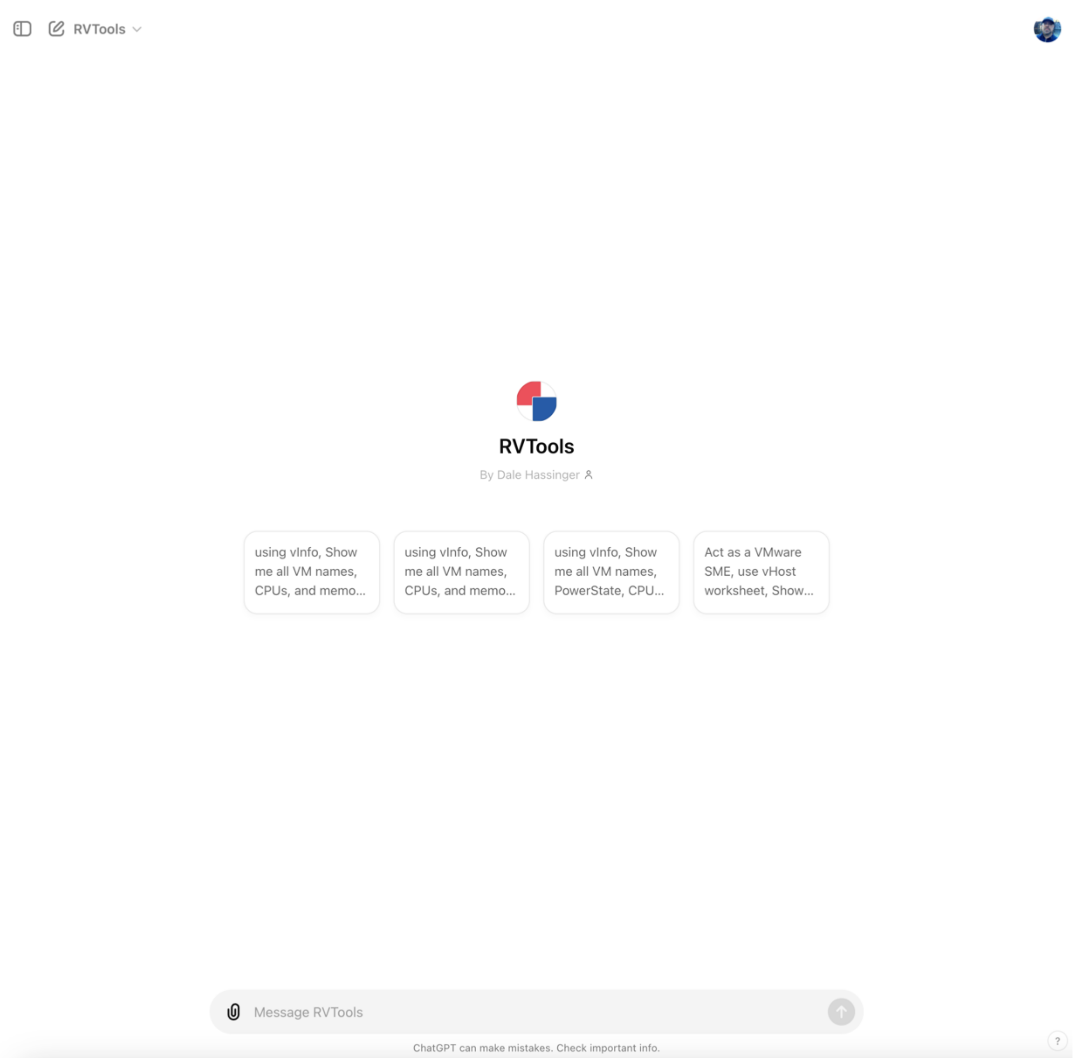
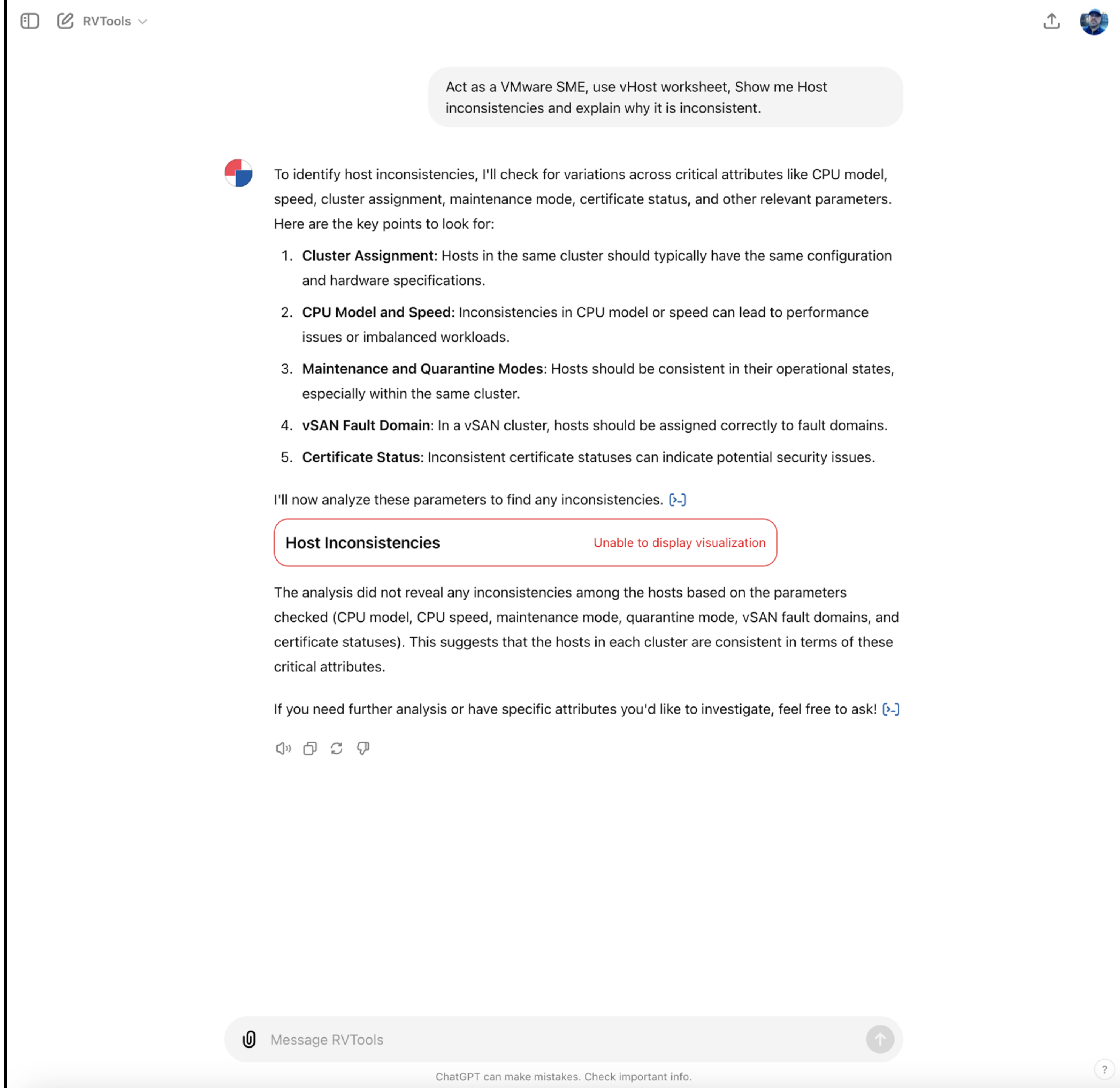

RVTools
RVTools
By Dale Hassinger
using vInfo, Show me all VM names, CPUs, and memo...
using vInfo, Show me all VM names, CPUs, and memo...
using vInfo, Show me all VM names, PowerState, CPU...
Act as a VMware SME, use vHost worksheet, Show...
Message RVTools
ChatGPT can make mistakes. Check important info.



Act as a VMware SME, use vHost worksheet, Show me Host inconsistencies and explain why it is inconsistent.

To identify host inconsistencies, I'll check for variations across critical attributes like CPU model, speed, cluster assignment, maintenance mode, certificate status, and other relevant parameters. Here are the key points to look for:

1. **Cluster Assignment**: Hosts in the same cluster should typically have the same configuration and hardware specifications.
2. **CPU Model and Speed**: Inconsistencies in CPU model or speed can lead to performance issues or imbalanced workloads.
3. **Maintenance and Quarantine Modes**: Hosts should be consistent in their operational states, especially within the same cluster.
4. **vSAN Fault Domain**: In a vSAN cluster, hosts should be assigned correctly to fault domains.
5. **Certificate Status**: Inconsistent certificate statuses can indicate potential security issues.

I'll now analyze these parameters to find any inconsistencies.

Host Inconsistencies Unable to display visualization

The analysis did not reveal any inconsistencies among the hosts based on the parameters checked (CPU model, CPU speed, maintenance mode, quarantine mode, vSAN fault domains, and certificate statuses). This suggests that the hosts in each cluster are consistent in terms of these critical attributes.

If you need further analysis or have specific attributes you'd like to investigate, feel free to ask!

- Create a private GPT
- No programming required
- Your Data | Your Questions

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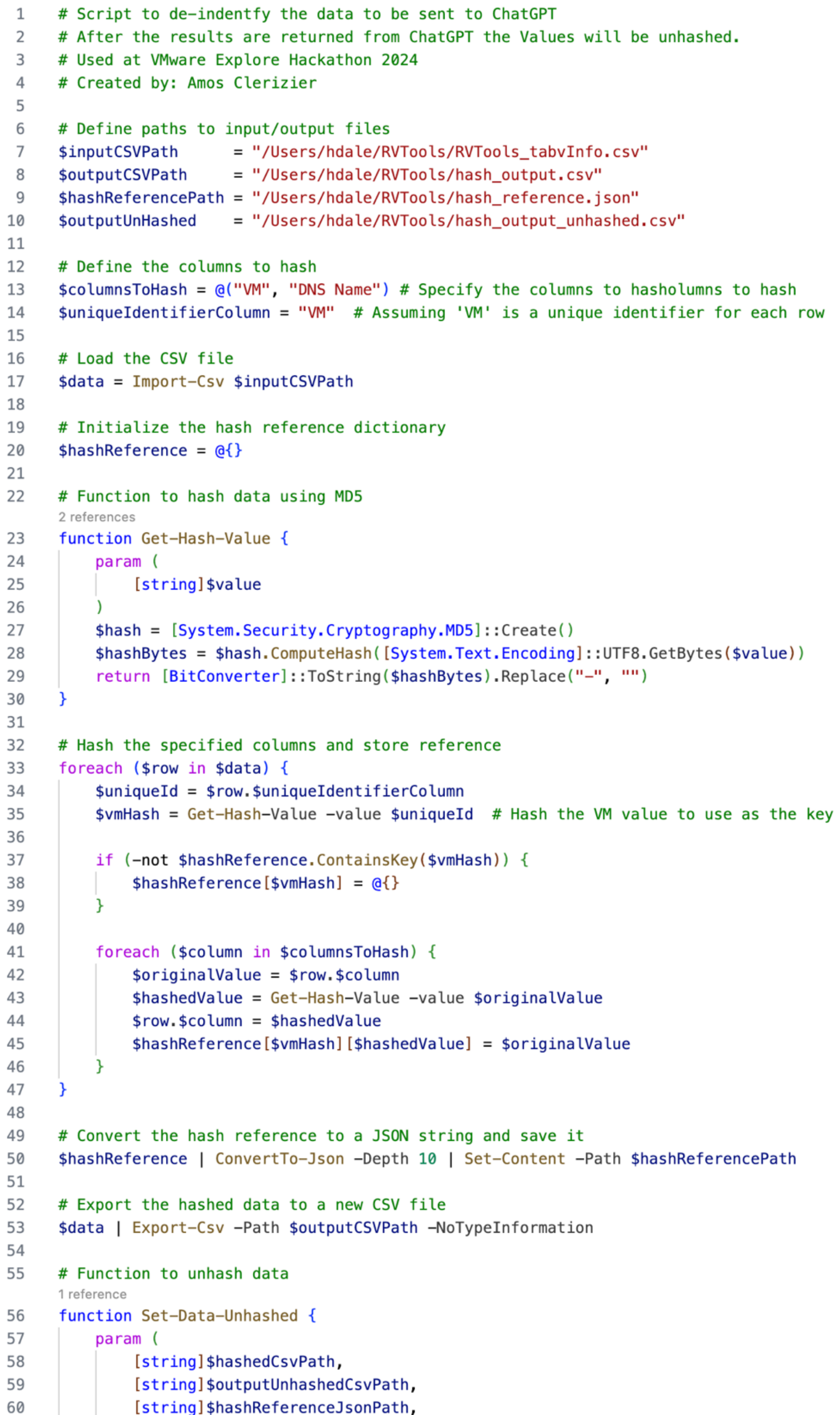
- Script to de-identify the data before sending to ChatGPT



```
# Script to de-indentfy the data to be sent to ChatGPT
# After the results are returned from ChatGPT the Values will be unhashed.
# Used at VMware Explore Hackathon 2024
# Created by: Amos Clerizier

# Define paths to input/output files
$inputCSVPath      = "/Users/hdale/RVTools/RVTools_tabvInfo.csv"
$outputCSVPath     = "/Users/hdale/RVTools/hash_output.csv"
$hashReferencePath = "/Users/hdale/RVTools/hash_reference.json"
$outputUnHashed    = "/Users/hdale/RVTools/hash_output_unhashed.csv"

# Define the columns to hash
$columnsToHash = @("VM", "DNS Name") # Specify the columns to hasholumns to hash
$uniqueIdentifierColumn = "VM"  # Assuming 'VM' is a unique identifier for each row

# Load the CSV file
$data = Import-Csv $inputCSVPath

# Initialize the hash reference dictionary
$hashReference = @{}

# Function to hash data using MD5
2 references
function Get-Hash-Value {
    param (
        [string]$value
    )
    $hash = [System.Security.Cryptography.MD5]::Create()
    $hashBytes = $hash.ComputeHash([System.Text.Encoding]::UTF8.GetBytes($value))
    return [BitConverter]::ToString($hashBytes).Replace("-", "")
}

# Hash the specified columns and store reference
foreach ($row in $data) {
    $uniqueId = $row.$uniqueIdentifierColumn
    $vmHash = Get-Hash-Value -value $uniqueId  # Hash the VM value to use as the key

    if (-not $hashReference.ContainsKey($vmHash)) {
        $hashReference[$vmHash] = @{}
    }

    foreach ($column in $columnsToHash) {
        $originalValue = $row.$column
        $hashedValue = Get-Hash-Value -value $originalValue
        $row.$column = $hashedValue
        $hashReference[$vmHash][$hashedValue] = $originalValue
    }
}

# Convert the hash reference to a JSON string and save it
$hashReference | ConvertTo-Json -Depth 10 | Set-Content -Path $hashReferencePath

# Export the hashed data to a new CSV file
$data | Export-Csv -Path $outputCSVPath -NoTypeInformation

# Function to unhash data
1 reference
function Set-Data-Unhashed {
    param (
        [string]$hashedCsvPath,
        [string]$outputUnhashedCsvPath,
        [string]$hashReferenceJsonPath,
```

Lessons Learned:

- Future thoughts on Hackathon Project
  - Go direct to vCenter or Operations for the Data. Use PowerCLI or APIs. Eliminate need for RVTools. RVTools made it easy for Hackathon so everyone could access the data easily.
  - Look at using AI Agents
- A lot of the chats we tested did not always give good results
- If you start the chat with “Act as an SRE” or “Act as a DBA”, the results would be more accurate

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Learning Resources:

- ChatGPT and ollama

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Got Questions?

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Thank You

Great Teamwork. Awesome collaboration.

Sharing the knowledge with the #vCommunity

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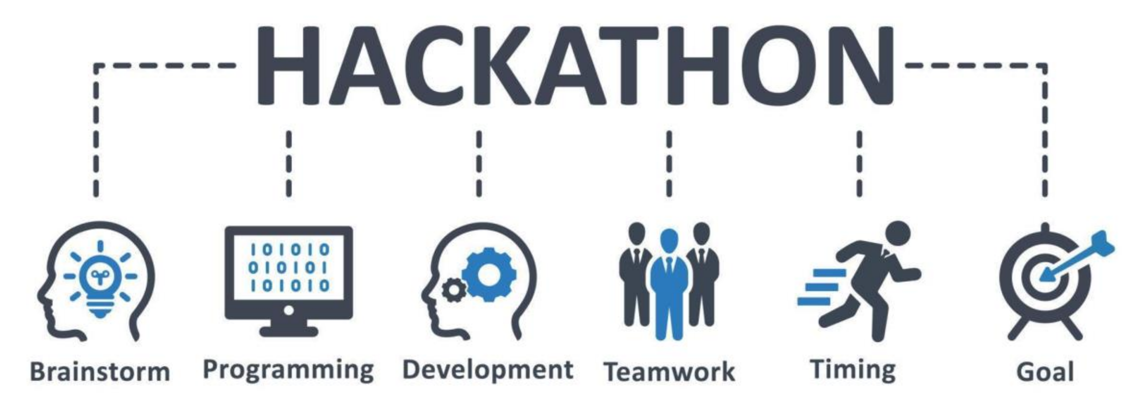
vmware EXPLORE

Las Vegas | August 26 – 29, 2024

Barcelona | November 4 – 7, 2023



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Thank You

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