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AI and the Art of Knowledge Base Building for Azure Virtual Desktop Support

Bridging AI and Data for a Smoother Support Experience

Ryan Mangan

RYAN MANGAN

CEO @

Ryan is an end-user computing (EUC) specialist & Cloud technologist. An author, speaker and presenter, who has helped customers and technical communities with end-user computing solutions.

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Agenda

- Introduction
- Challenge
- The Power of Data & AI
- Lets Look at Using AI with AVD
- Script Integration with OpenAI
- Error Handling using AI
- From Error to Knowladge
- A Proactive Approach
- Demonstration
- Benefits roadmap
- The way forward

Introduction

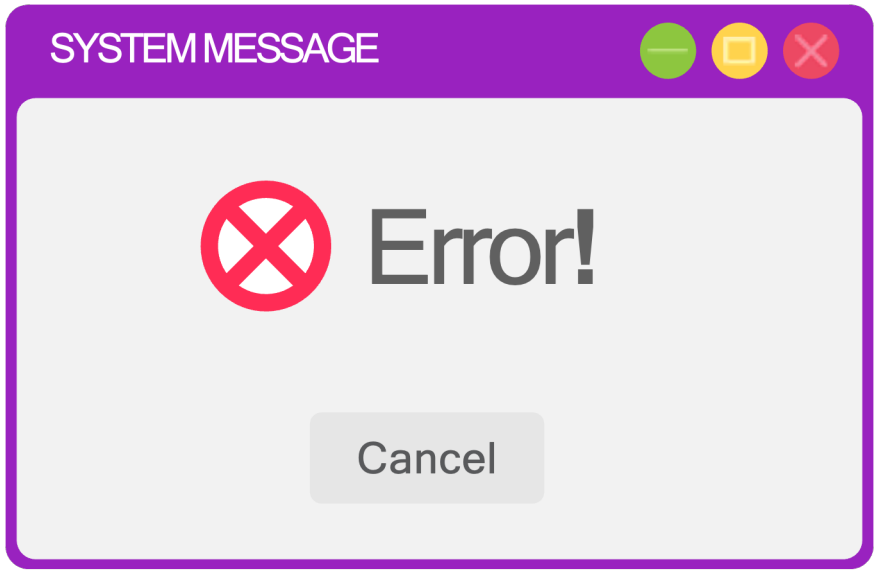
1. **The Changing Landscape of Tech Support**
   - As technology evolves, so do the expectations and demands of users.
   - Traditional support methodologies struggle to keep up with the vastness of the digital ecosystem.
   - There's an increasing need to turn to more intelligent solutions.

2. **Merging AI Capabilities with Human Intelligence**
   - Humans possess intuition, understanding, and the ability to empathise.
   - AI brings rapid data processing, pattern recognition, and immense knowledge.
   - Together, they create a formidable, efficient, and highly responsive support mechanism.

3. **Improving Support through Accumulated Knowledge**
   - Every error, every issue, every ticket is a learning experience.
   - AI allows us to accumulate this knowledge and transform it into actionable insights.
   - Future support is enhanced by drawing from these experiences, ensuring quicker resolutions and more satisfied users.

The Challenge

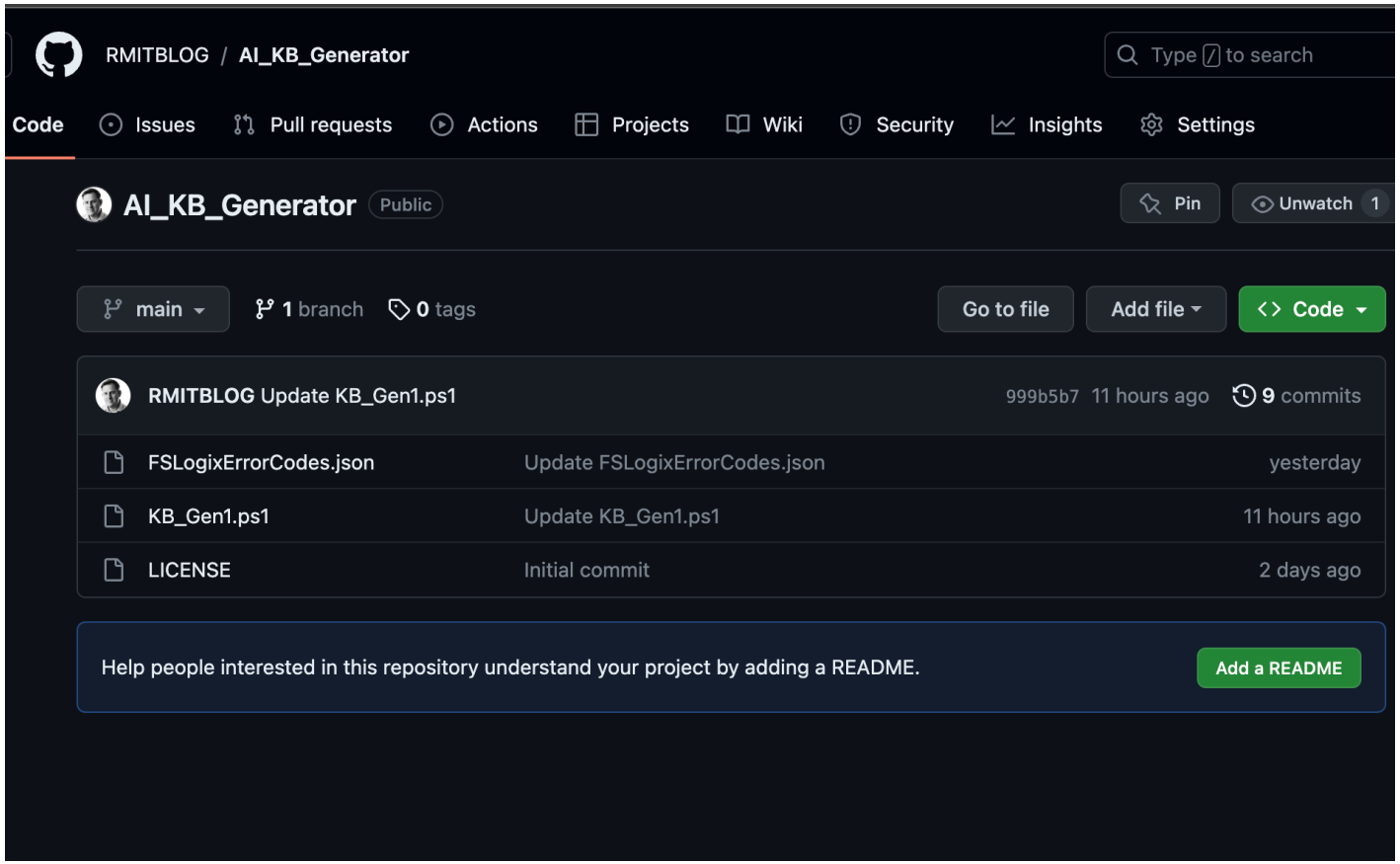
1. **A Plethora of Potential Issues**
   - Azure Virtual Desktop, while powerful, is susceptible to a myriad of potential glitches and errors.
   - From connectivity problems to application-specific errors, the landscape of issues is vast and varied.
   - The rapid adoption and diverse use cases further amplify the spectrum of potential challenges.
2. **Time-Consuming Manual Troubleshooting**
   - Traditional troubleshooting methods often involve sifting through logs, manual error identification, and long resolution times.
   - Each issue, while unique, often requires reinventing the wheel in terms of finding a solution.
   - The manual process is both tedious for the support teams and frustrating for the end-users.
3. **Need for a More Efficient Approach**
   - The current system, while effective to some extent, is far from optimal.
   - As Azure Virtual Desktop continues to grow and evolve, the support mechanism must keep pace.
   - There's a clear and pressing need for a smarter, faster, and more adaptive support strategy.



The Power of Data & AI

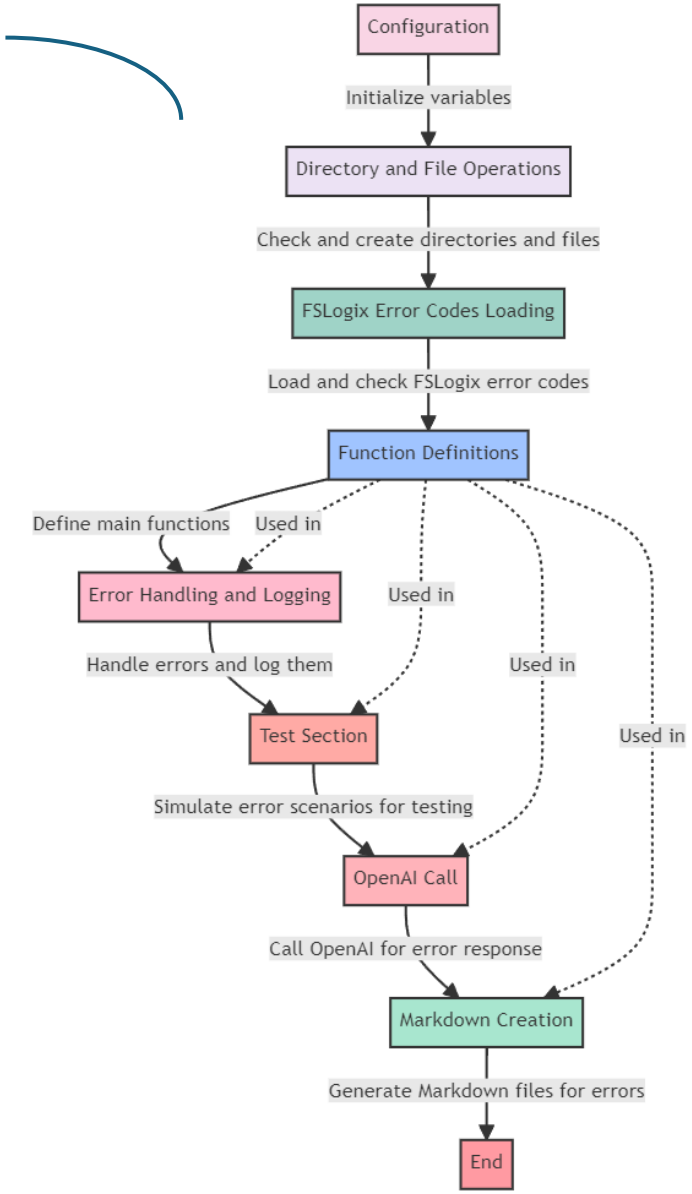
1. **Transforming Every Error into a Learning Experience**
   - Each error, each glitch, is not just a roadblock but an opportunity.
   - By capturing real-time data on these errors, AI can learn, adapt, and even predict future issues.
   - Mistakes are no longer mere setbacks but valuable lessons for continuous improvement.
2. **Predictive Analysis to Anticipate Issues**
   - Utilising AI's powerful analytical capabilities, we can foresee potential issues even before they manifest.
   - Predictive models, trained on vast amounts of historical data, help pre-empt problems, ensuring smoother user experiences.
   - By being proactive rather than reactive, we ensure a robust and resilient system.
3. **Refining User Experience through AI-Driven Solutions**
   - AI's primary goal isn't just to solve but to enhance.
   - By offering real-time solutions, optimising system performance, and minimising downtimes, AI significantly elevates the overall user experience.
   - The future isn't about just solving problems; it's about providing a seamless, hassle-free environment for users.

Lets now look at Using AI With AVD

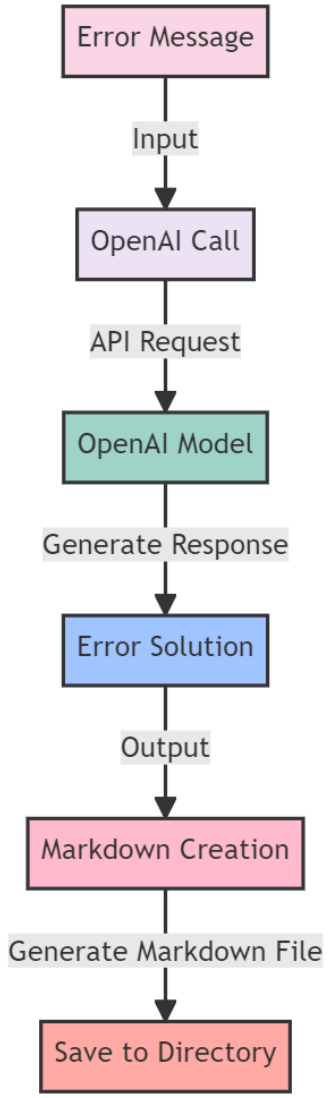


Grab the Script

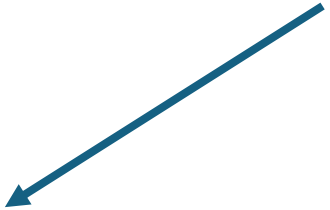
Script Workflow



OpenAI Process



```
    $apiEndpoint = $Endpoint
    $headers = @{
        "Content-Type" = "application/json"
        "api-key"      = $APIKEY
    }
    $body = @{
        messages = @(
            @{ role = "system"; content = $PreInformation  },  # Add pre-information
here
            @{ role = "system"; content = $fslogixErrorscodes },  # Add pre-information
here
            @{ role = "system"; content = "You are an IT professional looking for
technical answers to help resolve the $Classification error." },
            @{ role = "user"; content = "How to fix error: $Error" }
        )
        max_tokens         = 800
        temperature        = 0.7
        frequency_penalty = 0
        presence_penalty  = 0
        top_p              = 0.95
        stop               = $null
    } | ConvertTo-Json
```



Script Integration with OpenAI

1. **Fetching Error Codes: FSLogixErrorCodes.json**
   - FSLogix Overview: FSLogix is a set of solutions that enhance, enable, and simplify non-persistent Windows computing environments. Within the Azure Virtual Desktop sphere, it plays a pivotal role by improving performance and centralising user profiles.
   - Dynamic Error Retrieval: The script is designed to dynamically pull error codes from the FSLogixErrorCodes.json file. This ensures that the latest error definitions are always accessible, paving the way for real-time error identification and analysis.

2. **Understanding Error Classifications through Patterns**

   Pattern Recognition: By analysing the text and context of errors, our script exhibits a keen ability to identify recurring patterns. This swift recognition is instrumental in timely and accurate error categorisation.

   Mapping Errors: Once these patterns are discerned, the script efficiently maps them to specific error categories. This robust mapping process forms the bedrock upon which effective resolutions are built.

3. **Engaging OpenAI for Optimal Responses**
   - Seamless AI Integration: With OpenAI at its core, the script transcends traditional error-handling methodologies. This integration brings about not just intelligence but also an adaptive learning approach to troubleshooting.
   - Leveraging OpenAI's Acumen: Every time the script encounters an error, OpenAI dives deep into its extensive knowledge repository. Drawing from countless data points, it then recommends the most potent solution, ensuring that the troubleshooting process is not just fast but also effective.


```
{
  "Title": "FSLogix Error Codes",
  "Description": "Reason codes for use when troubleshooting FSL
  "ErrorCodes": [
    {
      "Code": 0,
      "Type": "Normal",
      "Description": "STATUS_SUCCESS",
      "Explanation": "Success"
    },
    {
      "Code": 1,
      "Type": "Error",
      "Description": "ERROR",
      "Explanation": "Can't load user's profile"
    },
    {
      "Code": 2,
      "Type": "Error",
      "Description": "ERROR_VIRT_DLL",
      "Explanation": "Virtual disk API isn't available on this
    },
    {
      "Code": 3,
      "Type": "Error",
      "Description": "ERROR_GET_USER",
      "Explanation": "Can't retrieve user's security identifier
    },
    {
      "Code": 4,
      "Type": "Error",
      "Description": "ERROR_HANDLE_ODFC",
```

```powershell
function Handle-Error {
    param (
        [Parameter(Mandatory = $true)]
        [string]$ErrorMessage
    )

    $mutex.WaitOne()

    $errorsList = @()
    if (Test-Path $errorLogFile) {
        $content = Get-Content $errorLogFile | ConvertFrom-Json
        # Ensure $errorsList is always an array
        $errorsList = @($content)
    }

    # Load the existing KB register
    $kbRegister = @()
    if (Test-Path $kbRegisterFile) {
        $kbContent = Get-Content $kbRegisterFile | ConvertFrom-Json
        $kbRegister = @($kbContent)
    }

   $existingMarkdownFile = Get-ChildItem -Path $markdownDirectory -Filter "*
    $content = Get-Content $_.FullName
    $content -match [regex]::Escape($ErrorMessage)
}

if ($existingMarkdownFile) {
    Write-Host "A Markdown file for this error already exists: $($existingMar
    $mutex.ReleaseMutex()
    return
}

# Check if the error message matches any FSLogix error codes
$fslogixError = $fslogixErrors | Where-Object { $ErrorMessage -match $_.Erro
if ($fslogixError) {
    # Append FSLogix error information to the pre-information content
    $PreInformation += "`n" + $fslogixError.Description
}
```

Error Handling Using AI

Mapping Error Patterns to Categories

- Intelligent Recognition: The prowess of AI lies in its ability to rapidly detect and categorise multifarious error patterns. By analysing code structure, contextual cues, and historical data, the AI discerns these patterns in real-time.
- Classification: A meticulous classification isn't just about labels; it's the compass guiding us to resolution. The precision in this step determines the swiftness and efficacy of the subsequent troubleshooting process.

Querying OpenAI for the Solution

- On-the-Fly Interaction: As an error rears its head, there's no manual lookup. The system instantaneously communicates with OpenAI, seeking guidance on the best remedy.
- Diving into the Knowledge Pool: OpenAI, with its vast and ever-expanding reservoir of data, scans for the most congruous solution. It's not about finding a solution, but the best solution.

Dynamic Markdown Creation for Accumulated Knowledge

- Active Documentation: Once a hurdle is overcome, the journey isn't over. The AI facilitates the creation of a markdown file detailing the error and its solution. It's like an athlete reviewing game tape; preparation for the future.
- Knowledge Vault: Over time, these markdown files burgeon into a formidable repository. This is no mere archive but a living, growing compendium ensuring that every past mistake paves the way for a faster resolution in the future.

From Error to Knowledge

Markdown Files: Rich, Formatted Knowledge Accumulation

- Living Documentation: Every error encountered isn't just a problem solved; it's knowledge gained. Each solution is meticulously documented in a markdown file, serving as an ever-growing manual.
- Continuous Evolution: These markdown files are not mere pages in an old book. They evolve, change, and grow. As new errors arise, or old ones recur in varied guises, our knowledge base adapts, ensuring that it's always relevant and up-to-date.

Proactive Support with Historical Data

- Drawing from Yesteryears: It's not about reinventing the wheel. Past errors provide insights, patterns, and early warning signs. By analysing these, we pre-empt potential problems before they become critical issues.
- Archives in Action: Our historical data isn't a dusty old library. It's an active ally, constantly accessed to provide insights, forecasts, and sometimes, a trip down memory lane to solve an enigmatic issue.

Streamlining Repetitive Issues

- The Pattern Detective: AI isn't just a solver; it's an observant detective. It identifies recurring issues, pinpoints their frequency, and traces their root causes, ensuring we're not just fighting fires but preventing them.
- Rapid Fire Solutions: Recognising recurring patterns isn't a mere academic exercise. By identifying these familiar foes, the AI enables lightning-fast resolutions. For the user, this means less downtime, fewer frustrations, and a smoother experience.

A Proactive Approach

Using Historical Data for Predictive Support

Memory Power: In the digital age, our AI's memory is its superpower. By accessing and analysing vast archives of past data, the system isn't just recalling; it's learning and improving.

Foreseeing the Future: AI's prowess lies not just in recognising past patterns but in using them to predict future glitches. By anticipating issues, we don't just react; we prepare, often stopping problems before they even start.

Minimising Downtimes and Improving User Experience

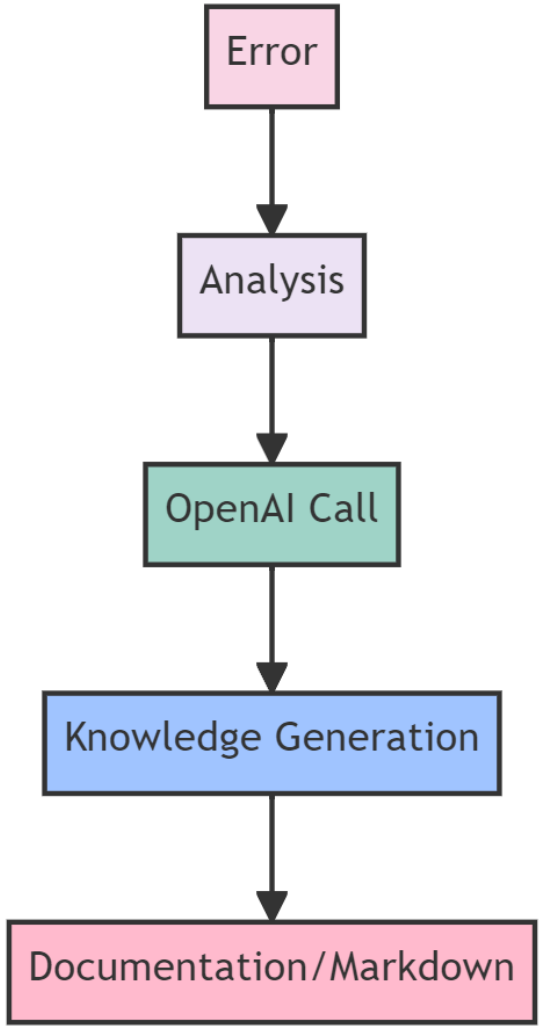
Proactive Measures: Gone are the days when we waited for things to break. With predictive insights at our fingertips, we act swiftly and decisively, heading off issues at the pass and ensuring smooth operations.

A Fluid Journey: It's not just about preventing problems; it's about enhancing the user's journey. An AI-driven experience ensures fewer interruptions, faster solutions, and a digital journey that feels smooth and intuitive.

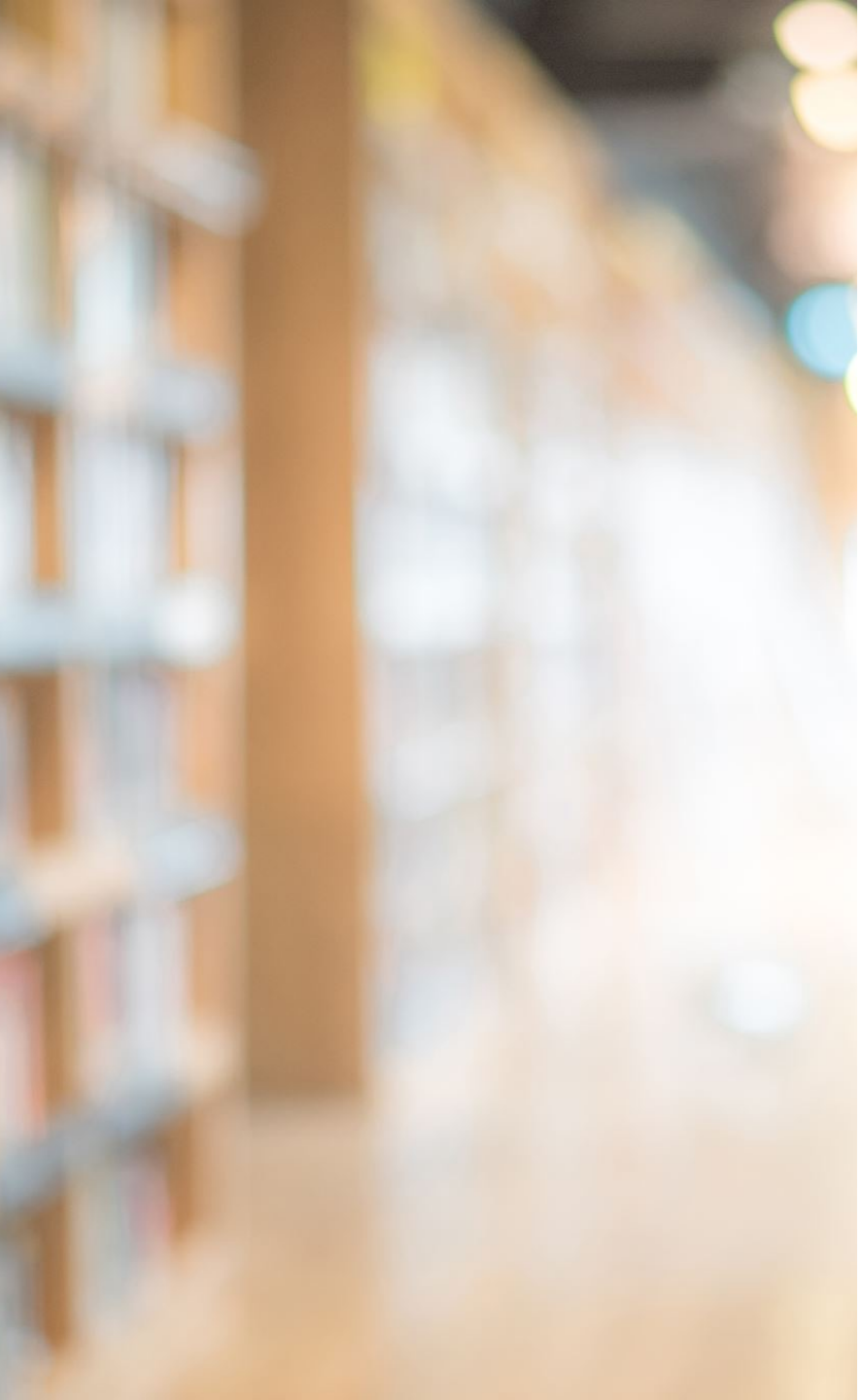
A Shift from Reactive to Proactive Support

Redefining Support: Our tech support paradigm is evolving. Instead of merely reacting to crises, we're focusing on preventing them. It's a shift from firefighting to fire prevention, and it's revolutionising the way we approach challenges.

Looking Beyond the Horizon: While it's crucial to address the challenges of today, our vision is firmly set on tomorrow. By being proactive, we're not just solving; we're strategising, ensuring that our support mechanisms are always a step ahead.



Examining the script



Demonstration

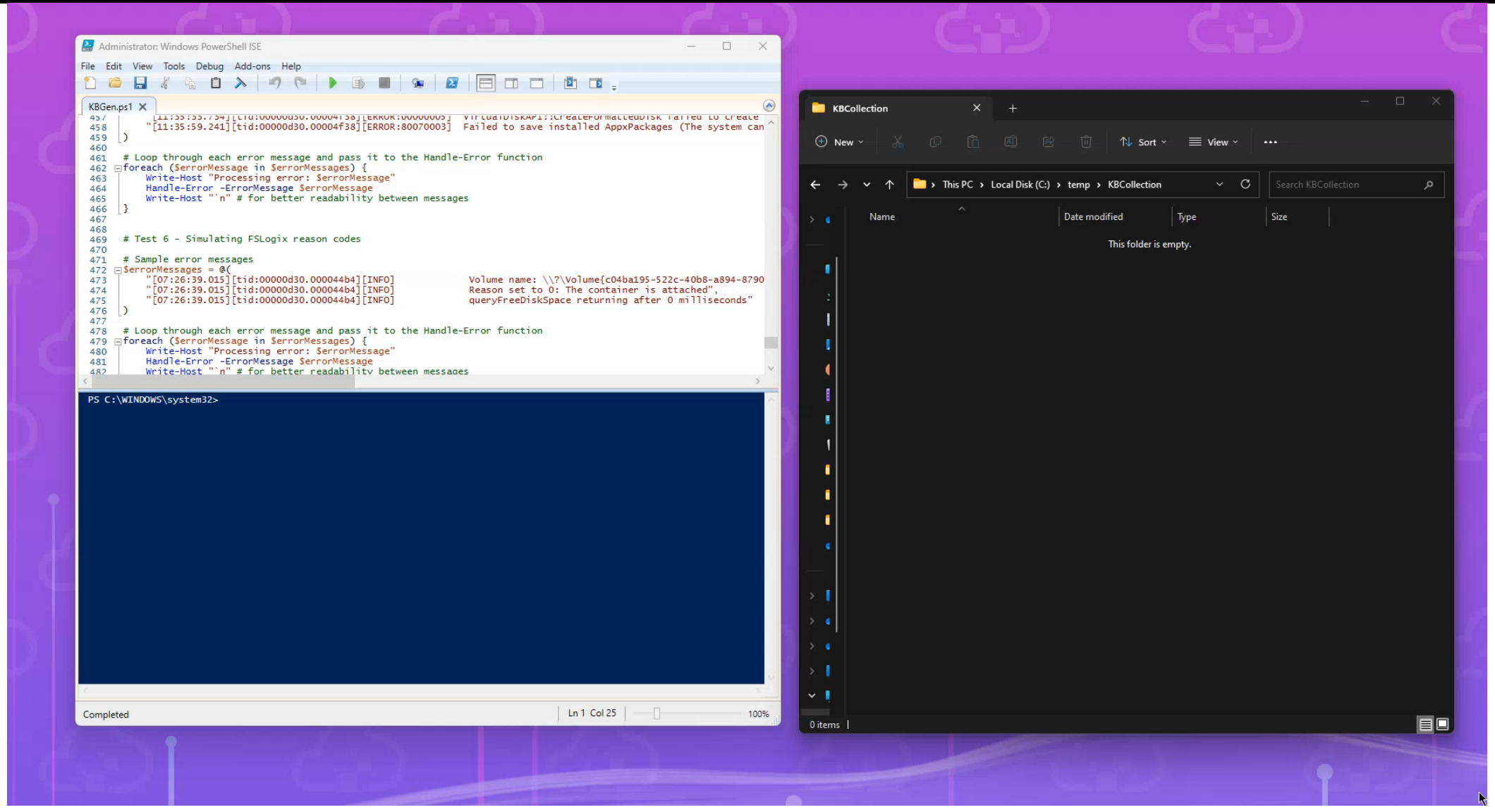
Watch OpenAI in Action

- Real-time Querying: Transition from error analysis to solution seeking. Show how post-analysis, the script instantly reaches out to OpenAI, seeking potential fixes.
- From Analysis to Answers: The audience gets a front-row seat to AI's prowess. Display the speed and accuracy with which OpenAI understands the problem and proposes actionable solutions.

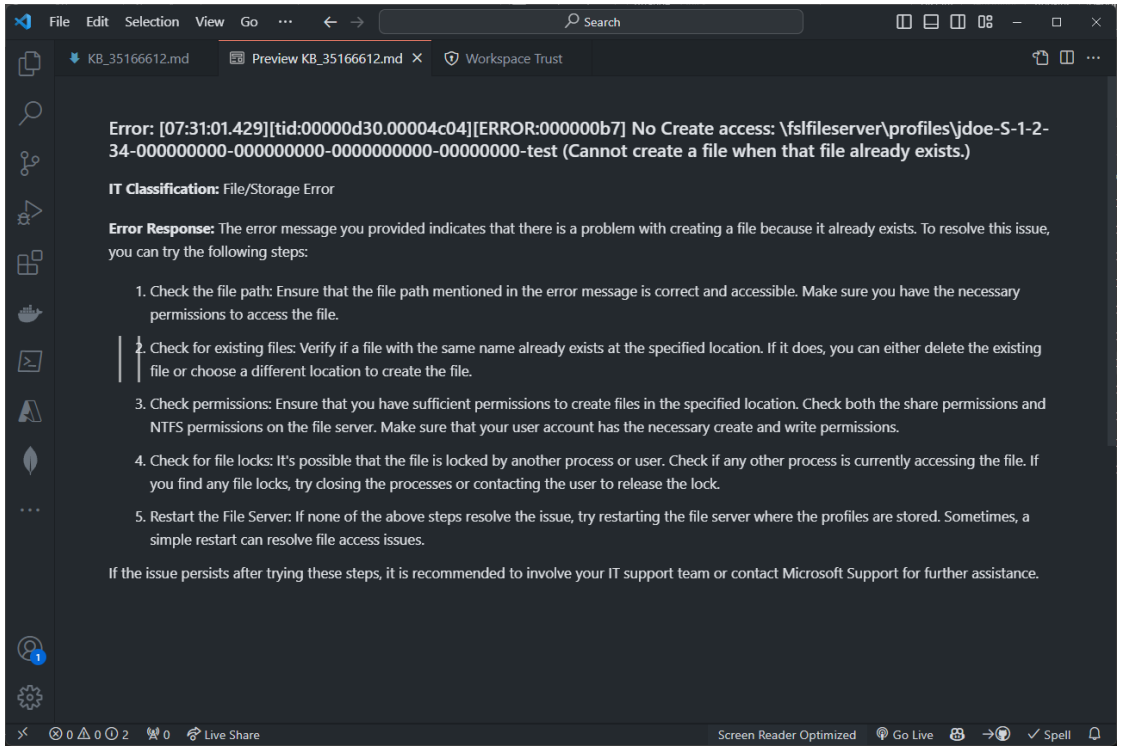
Experience the Creation of a Markdown Knowledge Snippet

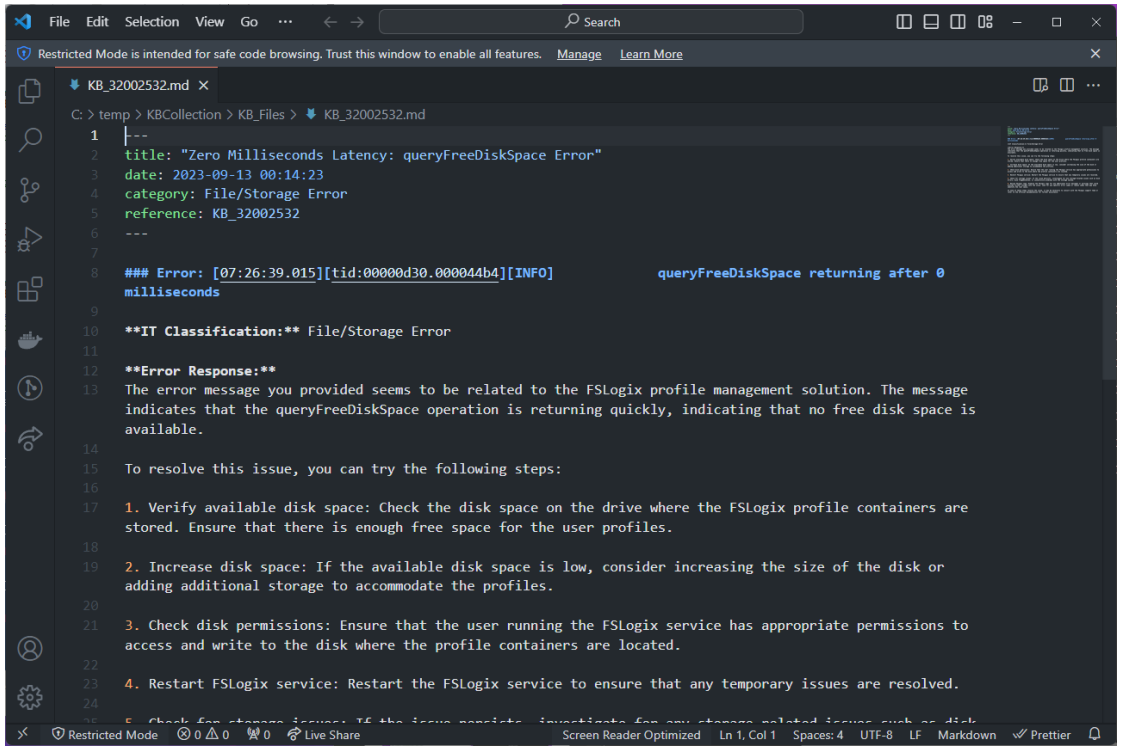
- Documentation Comes Alive: As the AI determines the solution, let the audience witness the creation of a markdown file in real-time. This showcases not just the problem-solving, but also the knowledge retention aspect of the system.
- Building Blocks of Knowledge: End on a forward-thinking note. Stress upon how every such markdown file isn't just a one-off solution but a brick in the ever-growing edifice of our knowledge repository.

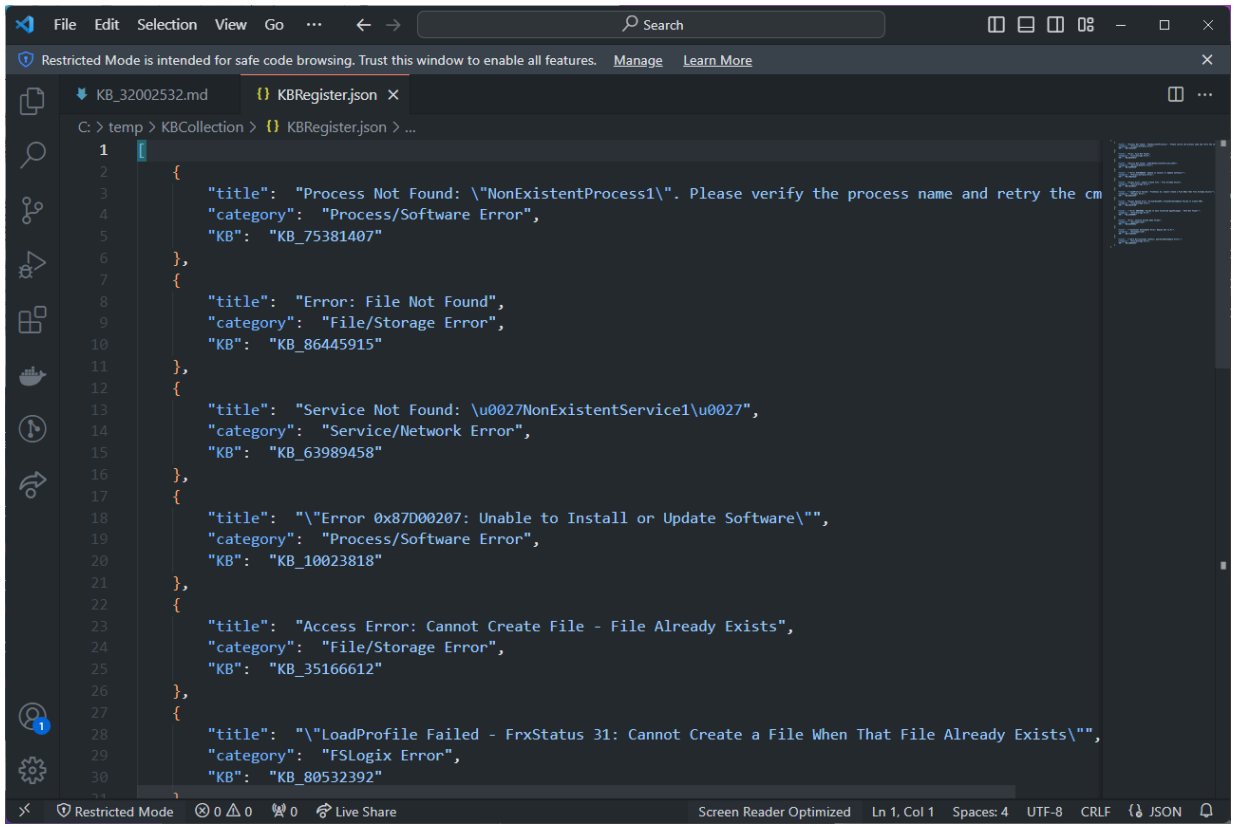
Demo


Administrator: Windows PowerShell ISE
File Edit View Tools Debug Add-ons Help
KBGen.ps1
"[11:35:59.241][tid:00000d30.00004f38][ERROR:80070003] Failed to save installed AppxPackages (The system can
)
# Loop through each error message and pass it to the Handle-Error function
foreach ($errorMessage in $errorMessages) {
Write-Host "Processing error: $errorMessage"
Handle-Error -ErrorMessage $errorMessage
Write-Host "`n" # for better readability between messages
}
# Test 6 - Simulating FSLogix reason codes
# Sample error messages
$errorMessages = @(
"[07:26:39.015][tid:00000d30.000044b4][INFO] Volume name: \\?\Volume{c04ba195-522c-40b8-a894-8790
"[07:26:39.015][tid:00000d30.000044b4][INFO] Reason set to 0: The container is attached",
"[07:26:39.015][tid:00000d30.000044b4][INFO] queryFreeDiskSpace returning after 0 milliseconds"
)
# Loop through each error message and pass it to the Handle-Error function
foreach ($errorMessage in $errorMessages) {
Write-Host "Processing error: $errorMessage"
Handle-Error -ErrorMessage $errorMessage
Write-Host "`n" # for better readability between messages
PS C:\WINDOWS\system32>
Completed
Ln 1 Col 25
100%
KBCollection
New
Sort
View
This PC › Local Disk (C:) › temp › KBCollection
Search KBCollection
Name
Date modified
Type
Size
This folder is empty.
0 items

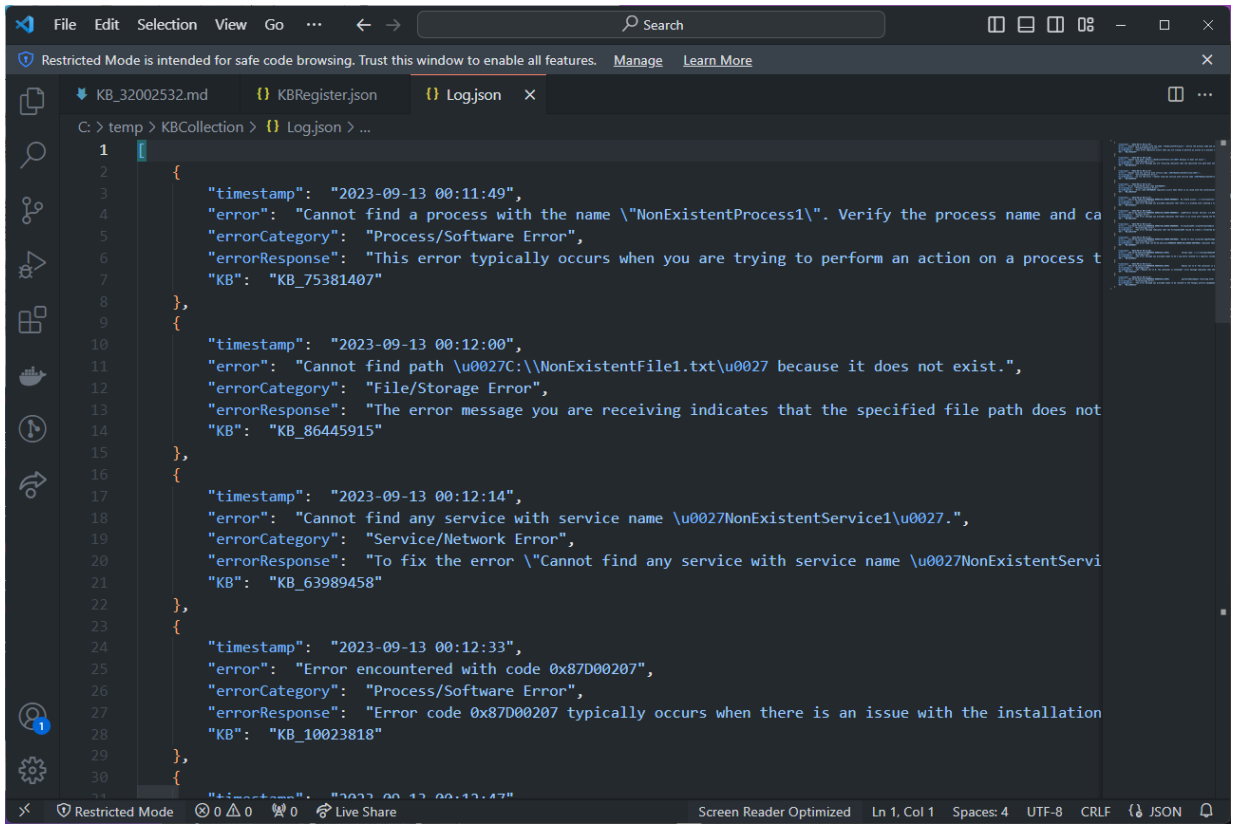
Markdown Files







KB Register



Log File

Benefits Roundup

Faster Issue Resolution

Traditional vs. AI: Juxtapose the time taken for traditional support to resolve an issue against the lightning-fast efficiency of AI. Emphasize that with AI, gone are the days of lengthy downtimes and drawn-out troubleshooting.

Instant Analytics: Highlight that AI isn't just about quick fixes but instantaneous and profound analysis, which makes the fixes more precise and relevant.

Rich, Centralised Knowledge Base

Ever-evolving Documentation: Speak about how every error encountered and every solution implemented contributes to the knowledge base. Unlike static databases, this one learns and grows.

Accessible Intelligence: While it's centralised, it's also universally accessible. Whether it's a newbie or a veteran in the support team, everyone has the same rich data at their fingertips.

Empowered Support Teams

Beyond Troubleshooting: Point out that with AI handling the heavy lifting, the support team is freed up to focus on more critical, strategic tasks. Their roles evolve beyond just problem-solving.

Confidence Boost: Having AI as an ally means the support teams operate with increased confidence. They know that they have a robust backup, ready to jump in with solutions when things get complex.

The Way Forward

Continuous Learning & Adaptation

- Ever-evolving Intelligence: Highlight that the integration of AI is not a one-time setup but an ongoing journey. As more data pours in, the AI continually refines its understanding, becoming more adept at its role.
- Feedback Loop: Discuss the importance of feedback in this journey. As solutions are implemented and results are seen, the AI learns from this feedback, ensuring better outcomes with each iteration.

Expanding AI's Role in Troubleshooting

- Beyond Error Detection: Delve into how the future might see AI playing a role not just in identifying and resolving errors but possibly in predicting and preventing them before they even occur.
- Holistic Integration: Talk about potential plans to integrate AI more deeply into the entire Azure Virtual Desktop environment, making AI's insights and capabilities available at every stage of the user experience.

Building a Resilient and Robust Support Ecosystem

- Unified Support System: Envision a future where all elements of the support system, from AI to human teams to the end-users, are interconnected, sharing insights, feedback, and solutions in real-time.
- Bounce-back Capability: Discuss the ambition to build a system so robust that even in the face of unexpected disruptions, the recovery is swift and seamless, ensuring minimal impact on the end-users.

Sustainable AI for IT Professionals

Sustainable Scripting with AI:

- Efficient Code Execution: Harness AI to optimise scripts, reducing computational loads and environmental footprints.
- Maximise Reusability: Design scripts modularly to avoid repeated AI interactions, conserving resources.

Storing & Referencing AI Outputs:

- Cache Intelligence: After leveraging OpenAI, store results for easy reference, eliminating the need for repeated AI invocations.
- Cost & Energy Saving: Save both finances and power by minimising unnecessary AI requests.

Proactive AI Integration:

- Anticipate Frequent Tasks: With AI's help, detect common tasks and automate, reducing constant AI interactions.
- Smart Data Management for Scripts: Use AI's insights to efficiently manage script versions, ensuring streamlined systems.

Questions

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