



Writing Extensions with AI



Paulo Santana

IS Infrastructure Monitoring Specialist



The SysAdmin's Dilemma

- We want to monitor everything OOTB
- Sometimes we can't afford to wait
- Finding the right example isn't that easy
- The docs are solid, but a lot for small tasks
- Started many times... and stopped halfway



I might not be the only one...

Check Plugin Form Parameters

■ Checkmk Exchange checkmk-v2, plugin, rules

1h - Hello, I have a problem with one of my custom checks when I introduce a SingleChoice parameter form to an existing ruleset that has SimpleLevels parame...

How to write CheckMK Checks

■ Checkmk Exchange

Oct 18, 2024 - Hi everyone, I know there are not many options to make the topic even more generous, but I did that purposefully. I am now working multiple days on the first baby steps of writing a CheckMK plugin,...

Check Plugin Form Parameters

■ Checkmk Exchange checkmk-v2, plugin, rules

1h - Hello, I have a problem with one of my custom checks when I introduce a SingleChoice parameter form to an existing ruleset that has SimpleLevels parame...

[Check_mk (english)] Problems trying to write SNMP check

■ checkmk-en

Jun 11, 2019 - I'm trying to write a check for an Eaton PDU. After reading through https://checkmk.de/checkmk_devel_snmpbased.html and the apc_powernet_pdu check, I figured my best option would be to copy the apc...

Writing a simple winperf counter check (Windows counter to Checkmk)

■ How-to Articles

Aug 10, 2020 - This brief video show how to get a Windows performance counter, via Checkmk's built-in winperf handling so that you can actually see it in Checkmk. Requires creating a check. In this case, I'm pull...

☑ Help with agent_based and rulesets

■ Checkmk Exchange checkmk-v2, checkmk-enterprise, checkmk-v2-3

5d - Hi! I found the problem, it should be written as State(params['parameter_name']) it looks like this: if qemu_state == "running": state_code = State(par...

Building extensions brick by brick

- Started with a minimal working active check using AI

AI Prompt

...The script should set the exit code based on the value of the state parameter:
OK -> exit code 0, WARN -> exit code 1, CRIT -> exit code...



Buscar



Active Check

```
OMD[test]:~/local/lib/python3/cmk_addons/plugins/esp_ps/libexec$ python3 ./check_esp_ps_active_check_minimal  
State: OK
```

Building extensions brick by brick

- Gradually added ruleset, server-side call, and manual

References (AI Context)

- BS2000_Checks-1.0.1.mkp
- check_radius-0.1.1-20240428.mkp
- cordaware_bestinformed-1.2.4.mkp
- edirectory_monitor-1.0.1.mkp
- hpe_3par_ssh-2.3.2.mkp
- nvidia_smi-1.0.2.mkp
- ometemp-0.1.0.mkp
- rdp-active-check-2.0.0.mkp
- redfish-2.3.38.mkp
- sidecooler-2.0.2.mkp

Ruleset + Server Side Call

Service Name

Extension Starter Pack - Active Check -

✖ Initial State

OK

Check Status

OK

Extension Starter Pack - Active
Check - Minimal

Manual

Extension Starter Pack - Active Check - Minimal

check_esp_ps_active_check_minimal

This active check monitors a specified service's state base
It prints the service name along with its state and sets an a
The check does not rely on Checkmk agents but instead run

Extension Starter Pack - ActiveCheck - Minimal

Service Name

Extension Starter Pack - Active Check -

Initial State

Building extensions brick by brick

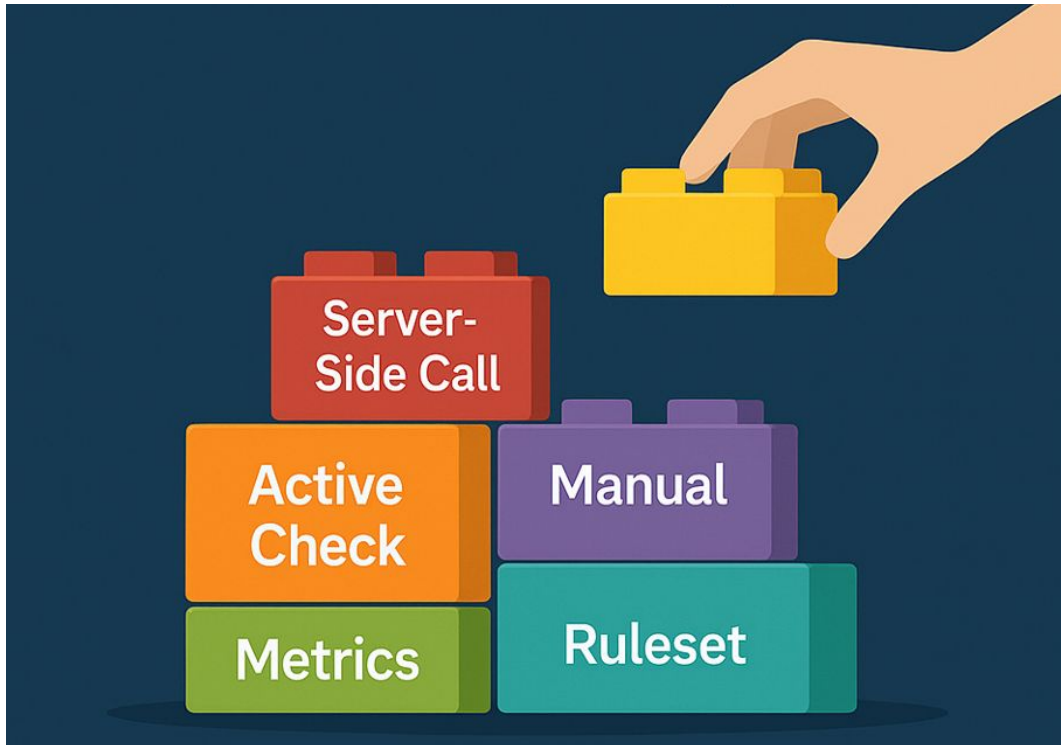
- Inserted AI-friendly comments to guide structure and support AI assistance

References (AI Context)

```
# AI Context: Checkmk is a monitoring tool  
  
# Import necessary modules from Checkmk  
from cmk.rulesets.v1.form_specs import FormSpec  
from cmk.rulesets.v1.rule_specs import RuleSpec  
  
# Define the form specification function  
def _formspec():  
    return Dictionary(  
        title=Title("Extension Starter"),  
        help_text=Help("A structured extension starter"),  
        elements={
```


Building extensions brick by brick

- Combining the bricks into an MKP



MKP Creation

| | |
|--|---|
| Package name (required) | esp_ps |
| Package version (required) | 1.0.0 |
| Minimum required Checkmk version | 2.3.0b1 |
| Valid until Checkmk version | No version limitation ▼ |
| Title (required) | Extension Starter Pack by Paulo Santana |
| Author | Paulo Santana |
| Homepage / Download - URL of this pack | https://github.com/paulosantanabr/esp_ps |

Setting up the Test Environment

Docker Desktop

- Started using VirtualBox VM
- Switched to Docker Desktop

Containers

Give feedback

View all your running containers and applications. [Learn more](#)

Container CPU usage

431.40% / 400% (4 CPUs available)

Container memory usage

1.97GB / 7.29GB

Show charts

Search

Only running

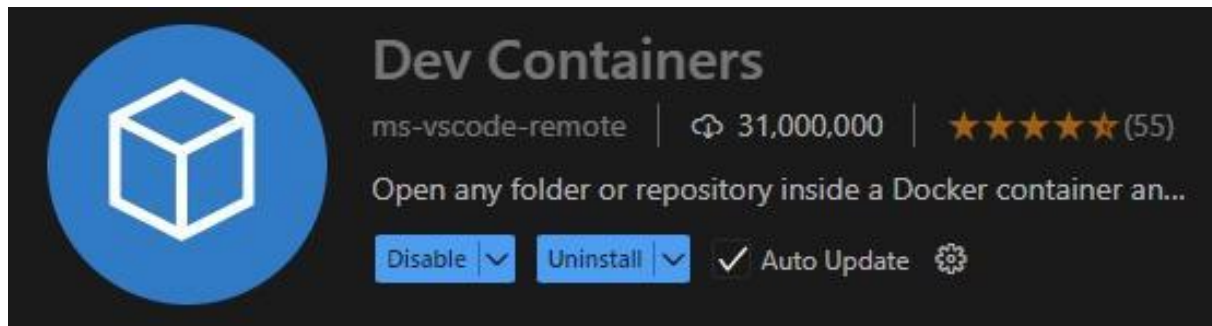
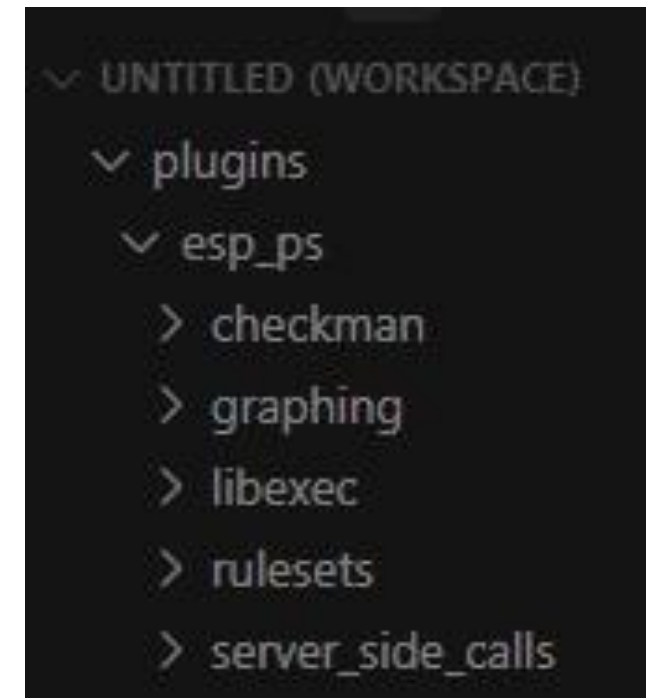
Sort by Until Version

| | Name | Container ID | Image | Port(s) | Actions |
|--|--------------|--------------|-----------|--|-------------------------------------|
| | cool_swirles | cd23f8a48608 | checkmk/c | 32768:5000 Show all ports (2) | <div></div> <div></div> <div></div> |

Setting up the Test Environment

Cursor + Container ENV

- Started using VSCode + GitHub Copilot + Dev SSH
- Switched to Cursor + Claude + Dev Containers
 - Custom Container Configuration File
 - Mapped plugins folder



Setting up the Test Environment

Checkmk + ESP Extension

Monitor

Customize

Setup

Extension packages

Setup > Maintenance > Extension packages

No pending changes

Packages

Display

Help

Find on this page ...

Upload package

List unpackaged files

Create package

Visit Checkmk exchange

Enabled (active on this site)

| Actions | Name | Version | Title | Author | Req. Version | Until Version | Contents |
|---------|--------|---------|---|---------------|--------------|---------------|--|
| | esp_ps | 1.1.0 | Extension Starter Pack by Paulo Santana | Paulo Santana | 2.3.0b1 | None | Additional Checkmk plug-ins by third parties: 18, GUI extensions (deprecated): 1 |

Enabled (inactive on this site)

No entries.

All packages (enabled or disabled)

| Actions | Name | Version | Title | Author | Req. Version | Until Version | Contents |
|---------|--------|---------|---|---------------|--------------|---------------|--|
| | esp_ps | 1.1.0 | Extension Starter Pack by Paulo Santana | Paulo Santana | 2.3.0b1 | None | Additional Checkmk plug-ins by third parties: 18, GUI extensions (deprecated): 1 |

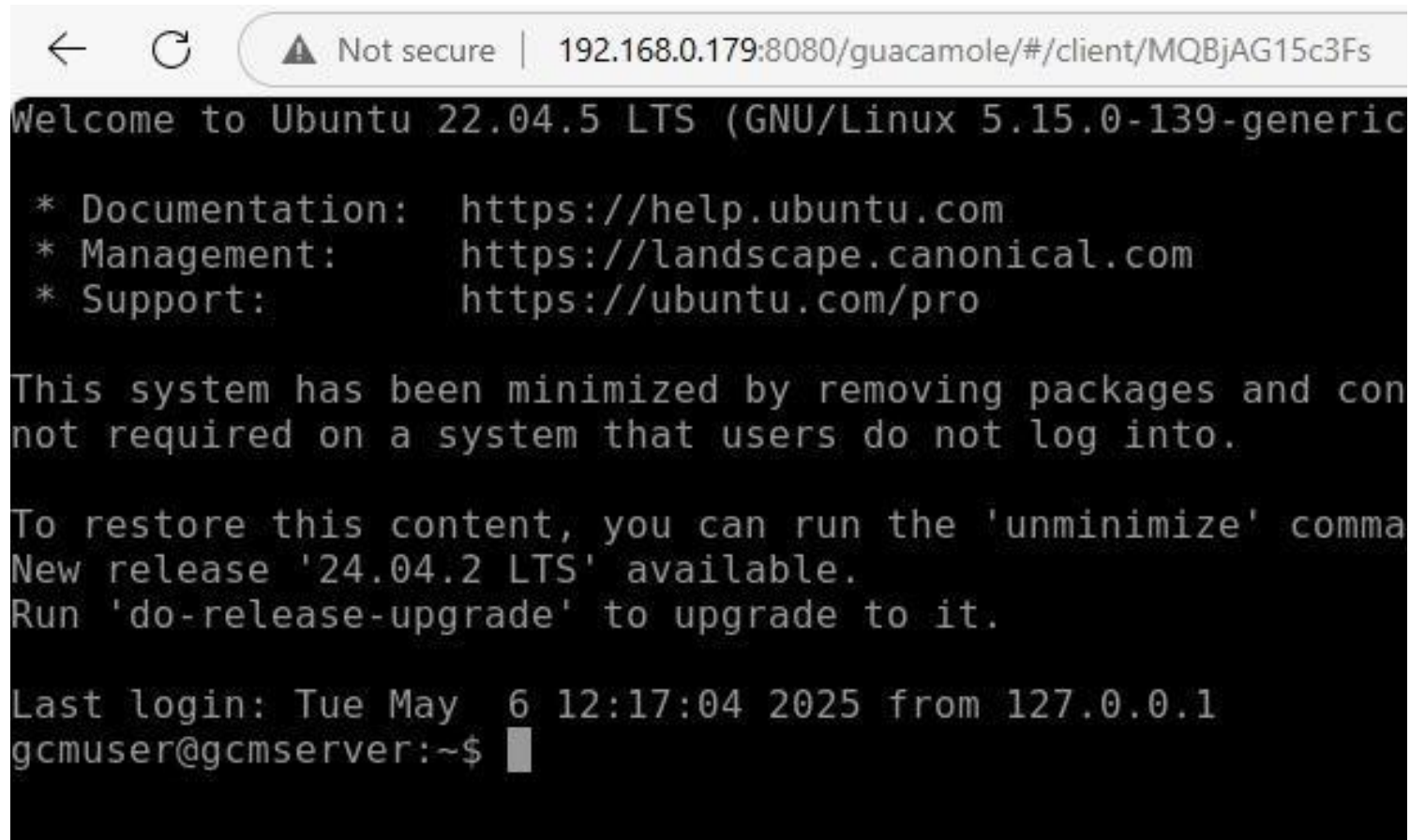
Real-World Challenge: Apache Guacamole

- Description: Web-based, multi-protocol client (SSH, RDP, VNC, etc.)
- Reason: A personal goal I've had for a long time
- Objective: Retrieve the number of active sessions via API



Setting up the Test Environment

Apache Guacamole



```
← ↻ ⚠ Not secure | 192.168.0.179:8080/guacamole/#/client/MQBjAG15c3Fs
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 5.15.0-139-generic)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

This system has been minimized by removing packages and con
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' comma
New release '24.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Tue May  6 12:17:04 2025 from 127.0.0.1
gcmuser@gcmserver:~$
```

Setting up the Test Environment

Apache Guacamole

SETTINGS

guacadmin

Active Sessions

History

Users

Groups

Connections

Preferences

This page will be populated with currently-active connections. The connections listed and the ability to kill those connections is dependent upon your access level. If you wish to kill one or more sessions, check the box next to those sessions and click "Kill Sessions". Killing a session will immediately disconnect the user from the associated connection.

Kill Sessions

Filter

| | Username | Active since | Remote host | Connection name |
|--------------------------|-----------|---------------------|---------------|---------------------------|
| <input type="checkbox"/> | guacadmin | 2025-05-06 09:19:30 | 192.168.0.144 | 127.0.0.1 |



✓ UNTITLED (WORKSPACE)

✓ plugins

✓ esp_ps

> checkman

> graphing

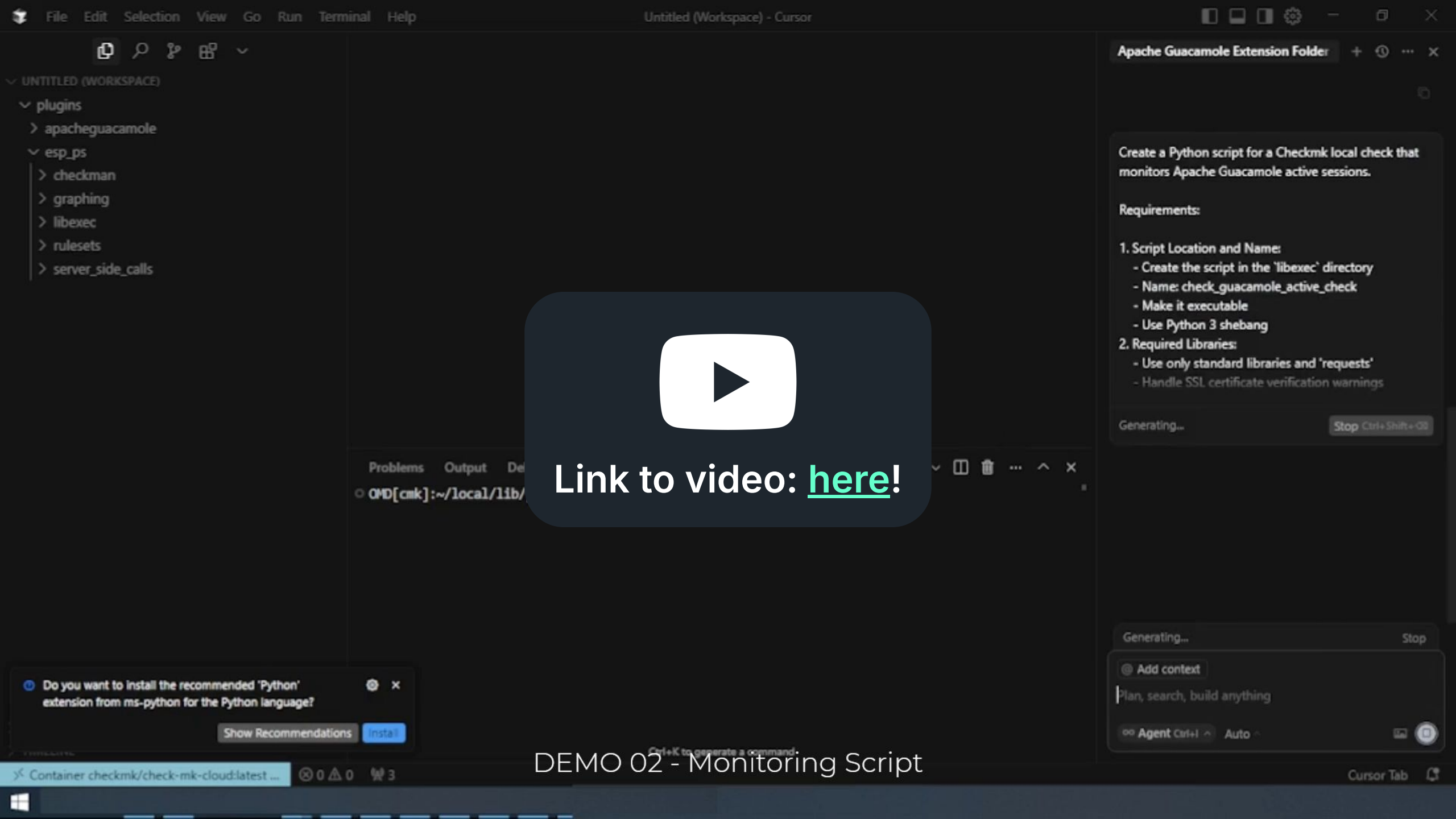
> libexec

> rulesets

> server_side_calls



Link to video: [here!](#)



Link to video: [here!](#)

Apache Guacamole Extension Folder

Create a Python script for a Checkmk local check that monitors Apache Guacamole active sessions.

Requirements:

1. Script Location and Name:

- Create the script in the 'libexec' directory
- Name: check_guacamole_active_check
- Make it executable
- Use Python 3 shebang

2. Required Libraries:

- Use only standard libraries and 'requests'
- Handle SSL certificate verification warnings

Generating...

Stop Ctrl+Shift+Q

Generating...

Stop

Add context

Plan, search, build anything

Agent Ctrl+I ^ Auto ^

DEMO 02 - Monitoring Script

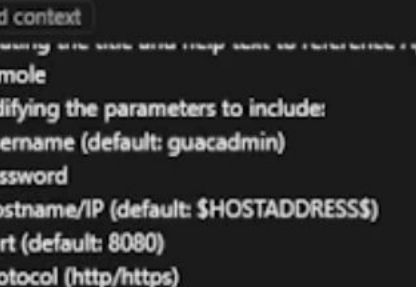


Link to video: [here!](#)

DEMO 03 - Ruleset

Apache Guacamole Extension Folder

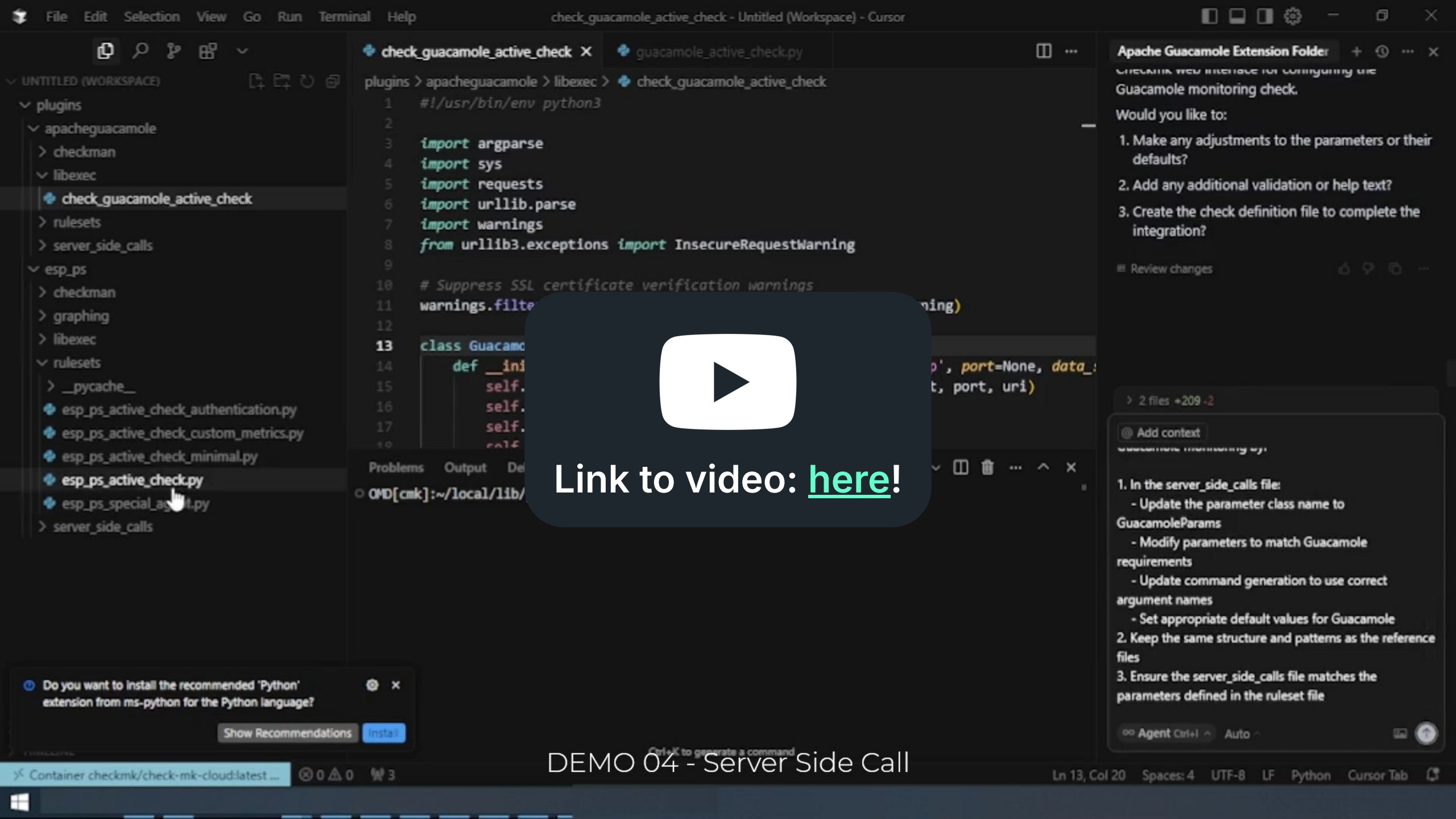
1. The script connected to the Guacamole server at `192.168.0.179:8080`
 2. It successfully authenticated with the provided credentials
 3. It retrieved the active sessions count
 4. The output shows there are currently 0 active sessions (`active_sessions=0`)
- The script is working as expected:
- It properly formatted the Checkmk output
 - It included the performance data metric (`active_sessions=0`)
 - It exited with status code 0, indicating success
- Would you like to:



```
> 1 file +109 -1
Add context
++ Representing the context as a configuration source. The context is then represented as
Guacamole
2. Modifying the parameters to include:
- Username (default: guacadmin)
- Password
- Hostname/IP (default: $HOSTADDRESS$)
- Port (default: 8080)
- Protocol (http/https)
- Data source (default: mysql)
- Base URI (default: /guacamole)
3. Remove any parameters not needed for Guacamole
monitoring
4. Keep the same structure and patterns as the reference
file
```

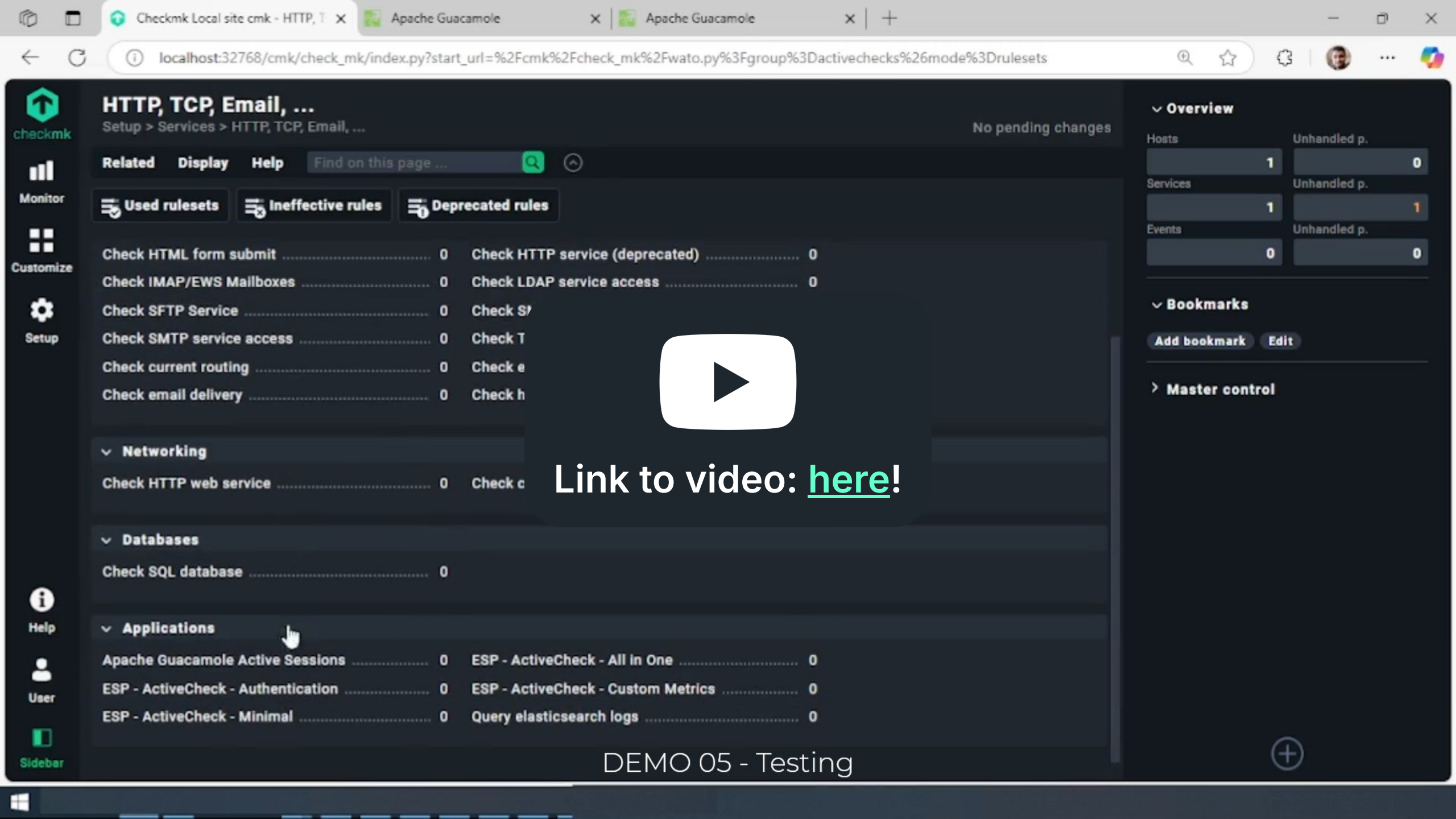
Do you want to install the recommended 'Python' extension from ms-python for the Python language?

Show Recommendations [Install](#)



Link to video: [here!](#)

DEMO 04 - Server Side Call



HTTP, TCP, Email, ...

Setup > Services > HTTP, TCP, Email, ...

No pending changes

Related Display Help

Find on this page ...

Used rulesets

Ineffective rules

Deprecated rules

| | | | |
|---------------------------------|---|---------------------------------------|---|
| Check HTML form submit | 0 | Check HTTP service (deprecated) | 0 |
| Check IMAP/EWS Mailboxes | 0 | Check LDAP service access | 0 |
| Check SFTP Service | 0 | Check S/ | |
| Check SMTP service access | 0 | Check T | |
| Check current routing | 0 | Check e | |
| Check email delivery | 0 | Check h | |

Networking

| | | | |
|------------------------------|---|---------|--|
| Check HTTP web service | 0 | Check c | |
|------------------------------|---|---------|--|

Databases

| | | | |
|--------------------------|---|--|--|
| Check SQL database | 0 | | |
|--------------------------|---|--|--|

Applications

| | | | |
|--|---|--|---|
| Apache Guacamole Active Sessions | 0 | ESP - ActiveCheck - All in One | 0 |
| ESP - ActiveCheck - Authentication | 0 | ESP - ActiveCheck - Custom Metrics | 0 |
| ESP - ActiveCheck - Minimal | 0 | Query elasticsearch logs | 0 |

Overview

| | |
|----------|--------------|
| Hosts | Unhandled p. |
| 1 | 0 |
| Services | Unhandled p. |
| 1 | 1 |
| Events | Unhandled p. |
| 0 | 0 |

Bookmarks

Add bookmark Edit

Master control

Link to video: [here!](#)

DEMO 05 - Testing

Lessons Learned

- Don't build everything at once
- Document Everything
- Context is very important
- Sometimes is best to start over



Thank you!

- Thank you for your time and attention
- Let's make extension building easier and more welcoming
- Happy to connect, collaborate, and share ideas



Extension Starter Pack by Paulo Santana

by [paulosantanabr](#)

Extension Starter Pack This extension assists users in writing and implementing ****Special Agents**** and ****Active Checks****, demonstrating best practices

📅 23 Feb 2025 👁 39485 ⬇ 344



ABB

