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Scenario : Securing a Docker Image Before Deployment to Production

John, a developer, is working on a web application called SecureApp that his team plans to deploy to a Kubernetes cluster in IBM Cloud. Before deployment, John wants to ensure the Docker image for SecureApp is secure and free from vulnerabilities. He decides to use IBM Cloud Container Registry and Vulnerability Advisor to scan the image for security issues and make the necessary corrections.

Steps :

- **Building the Docker Image**
- **Tag the image for container registry**
- **Login to IBM Cloud Container Registry**
- **Push Image to Container Registry**
- **Check Vulnerability Scan Results**
- **Address Vulnerabilities**
- **Rebuild and Re-scan the Image**
- **Deploy the Secure Image**

Steps and Screenshots :

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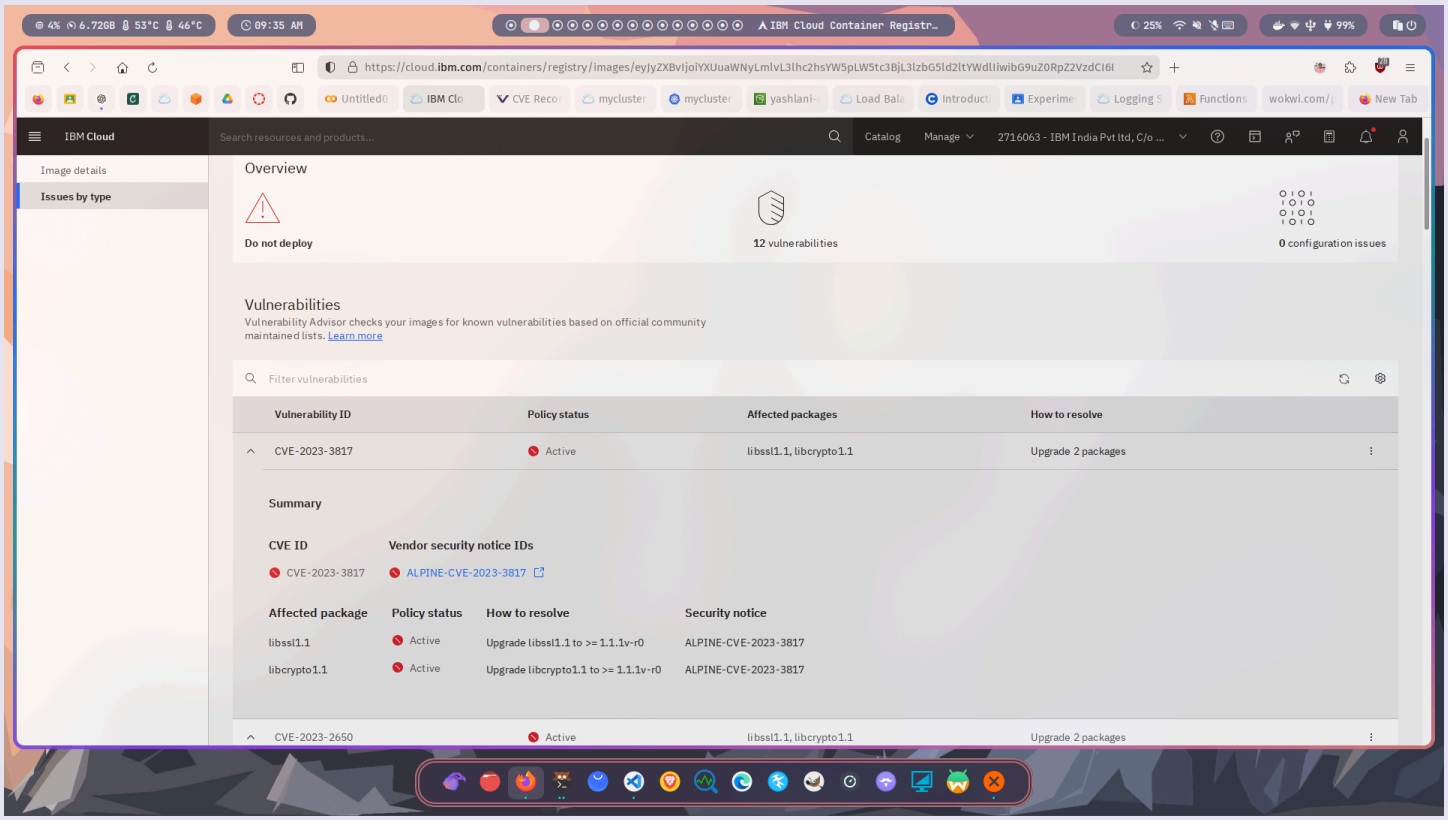
1. Use previously created image on IBM Container Registry and scan the vulnerabilities



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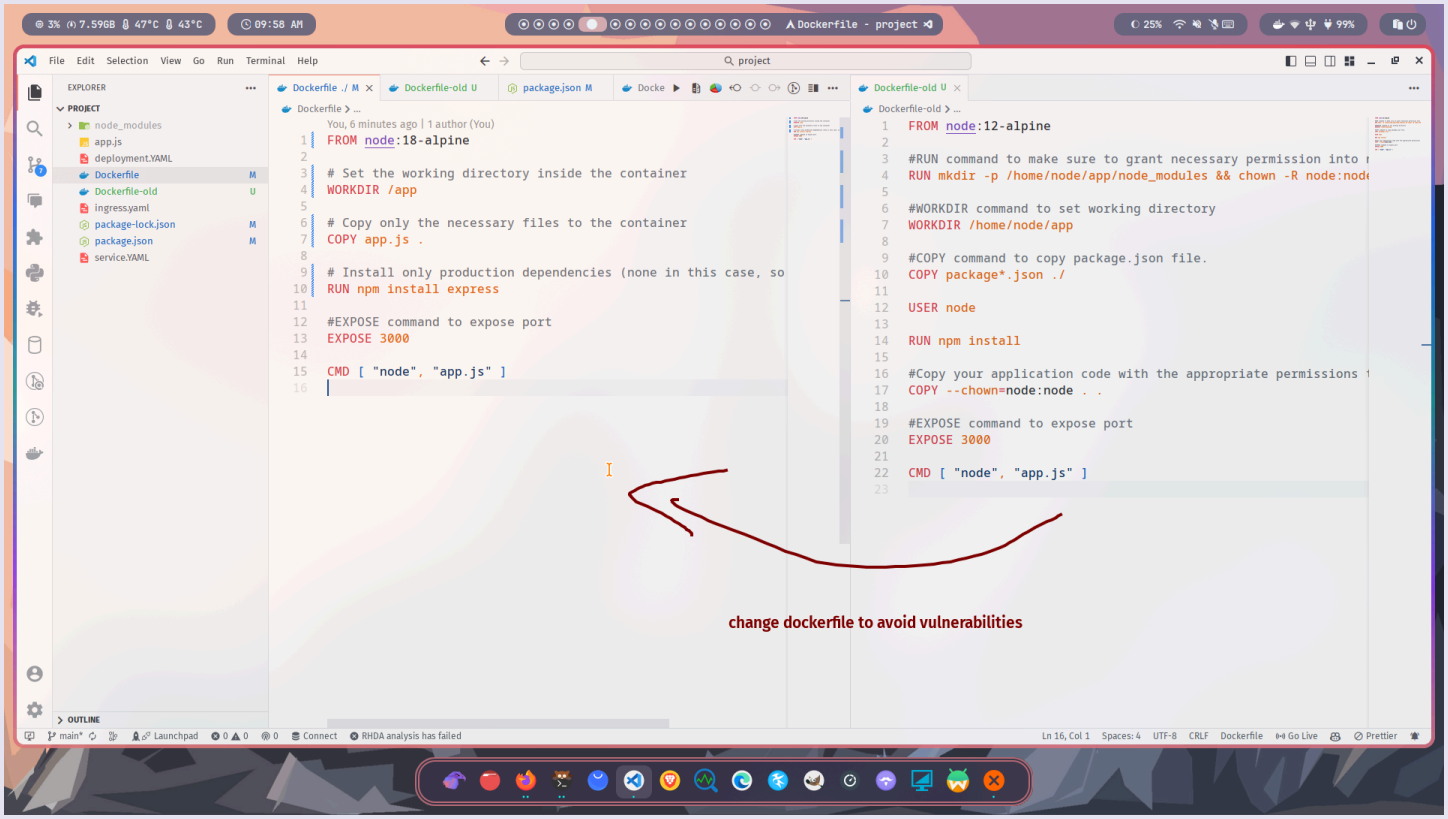
2. Modify Dockerfile to solve issues



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3. Build image

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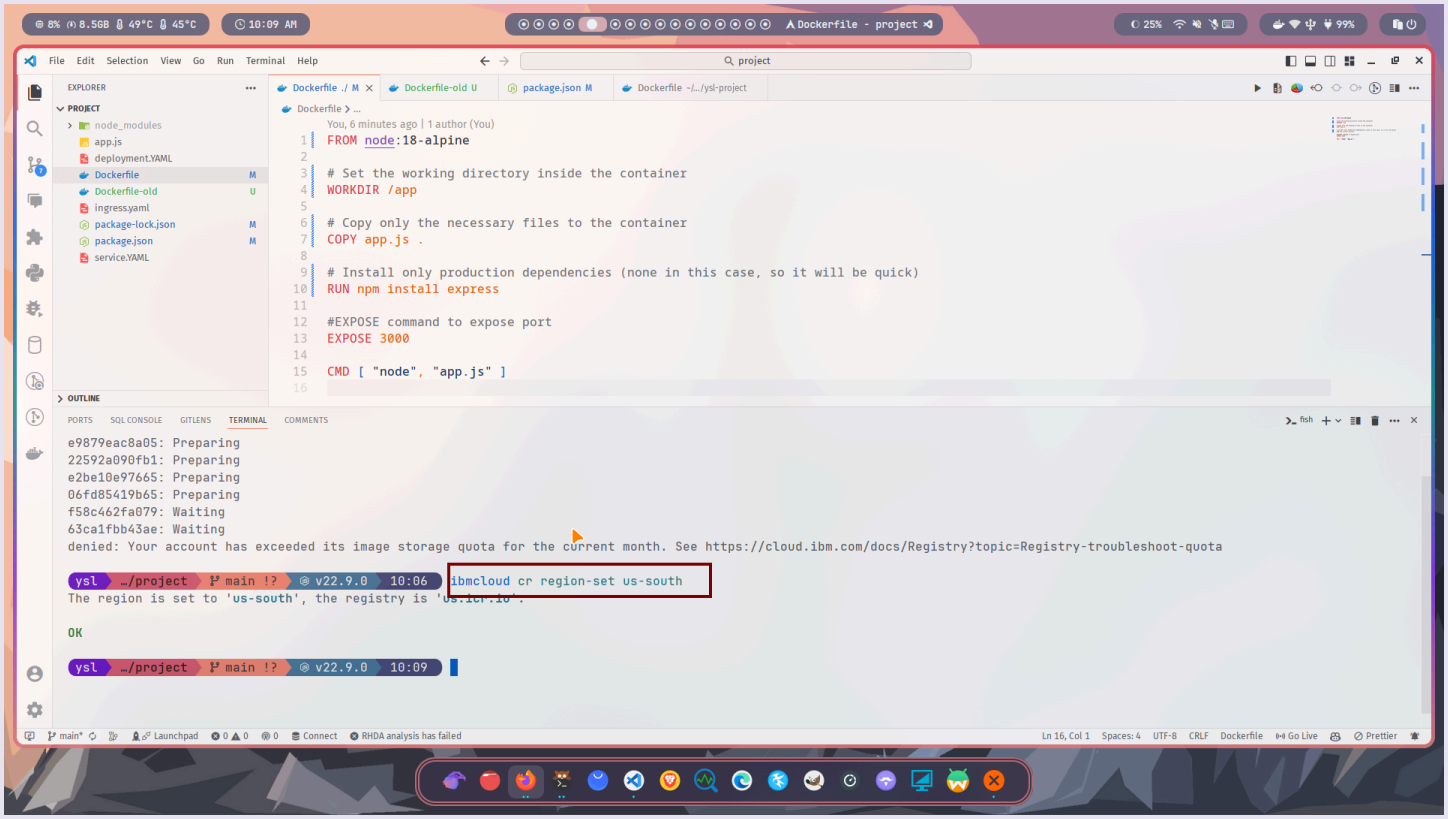
4. Tag and upload to Container Registry



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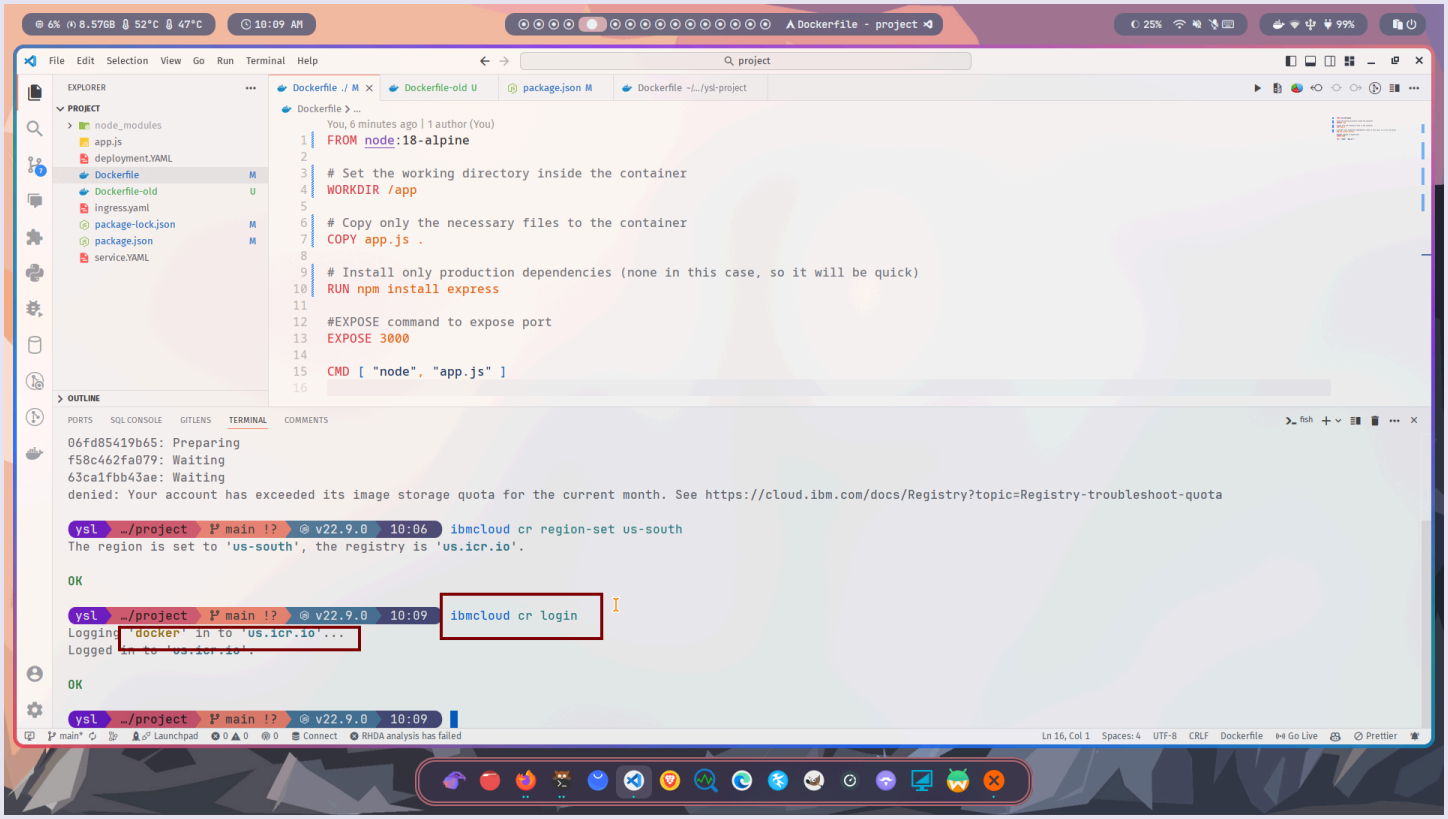

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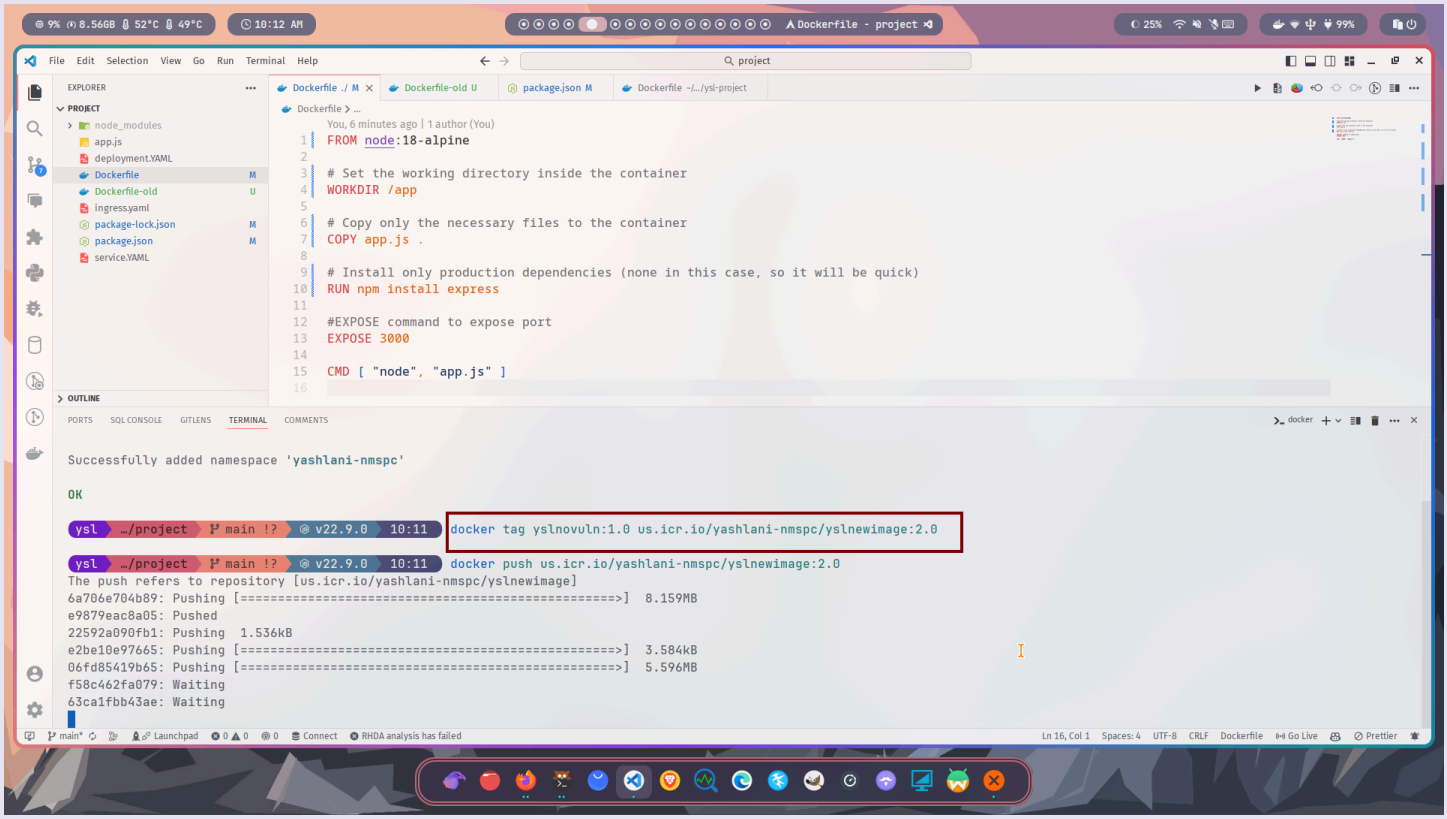

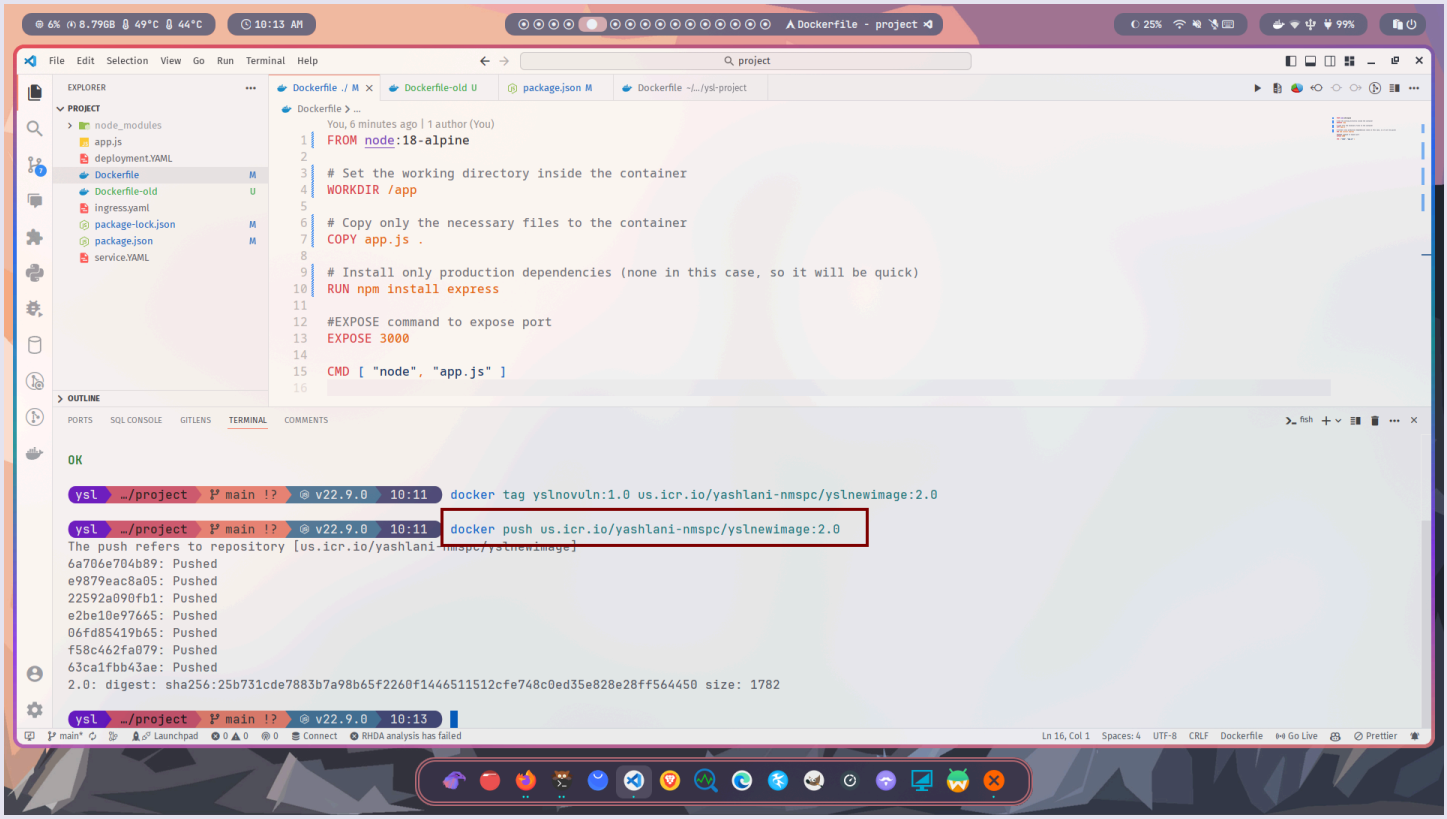

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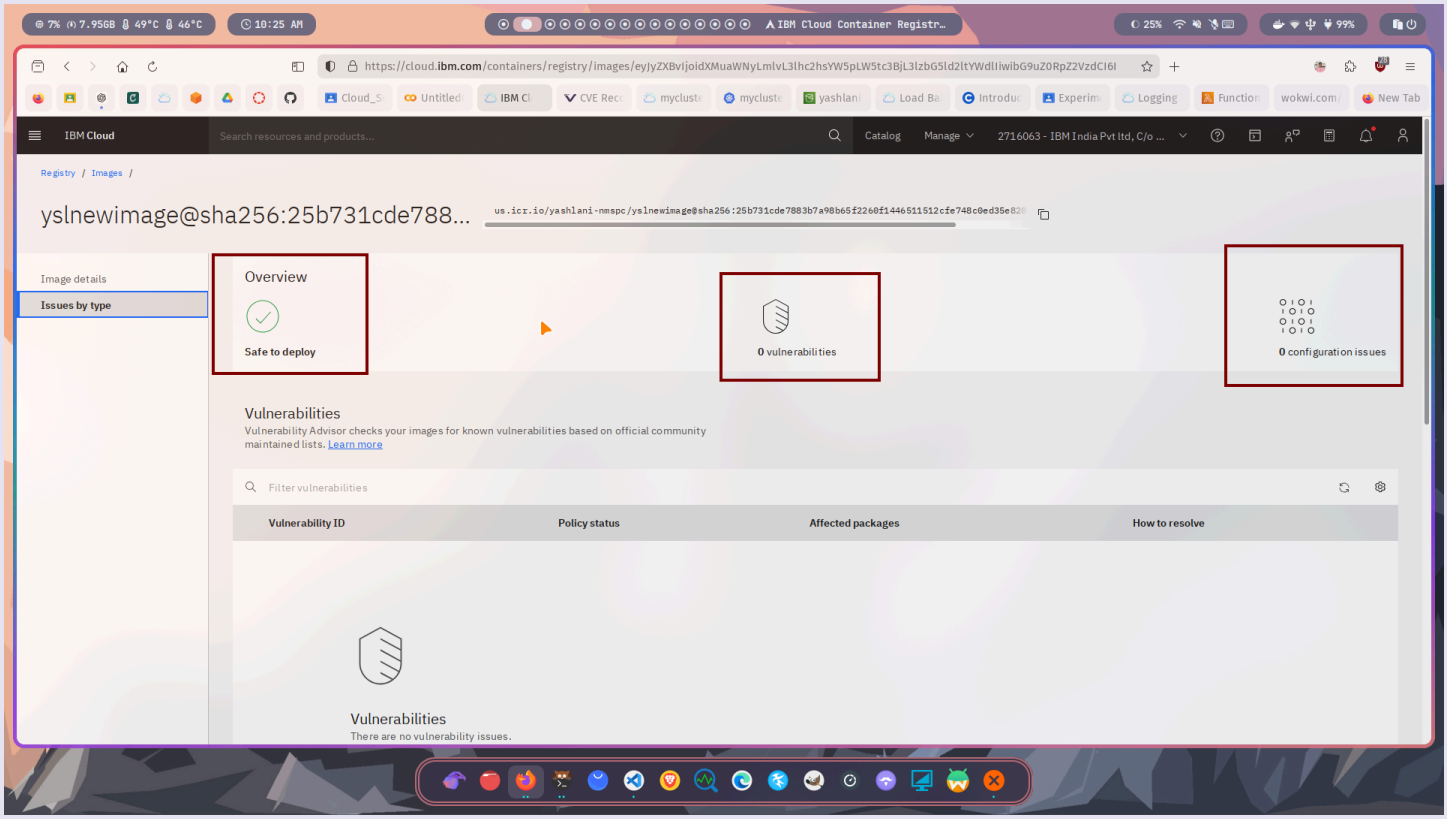
5. Now, check results of scan, no issues should be found



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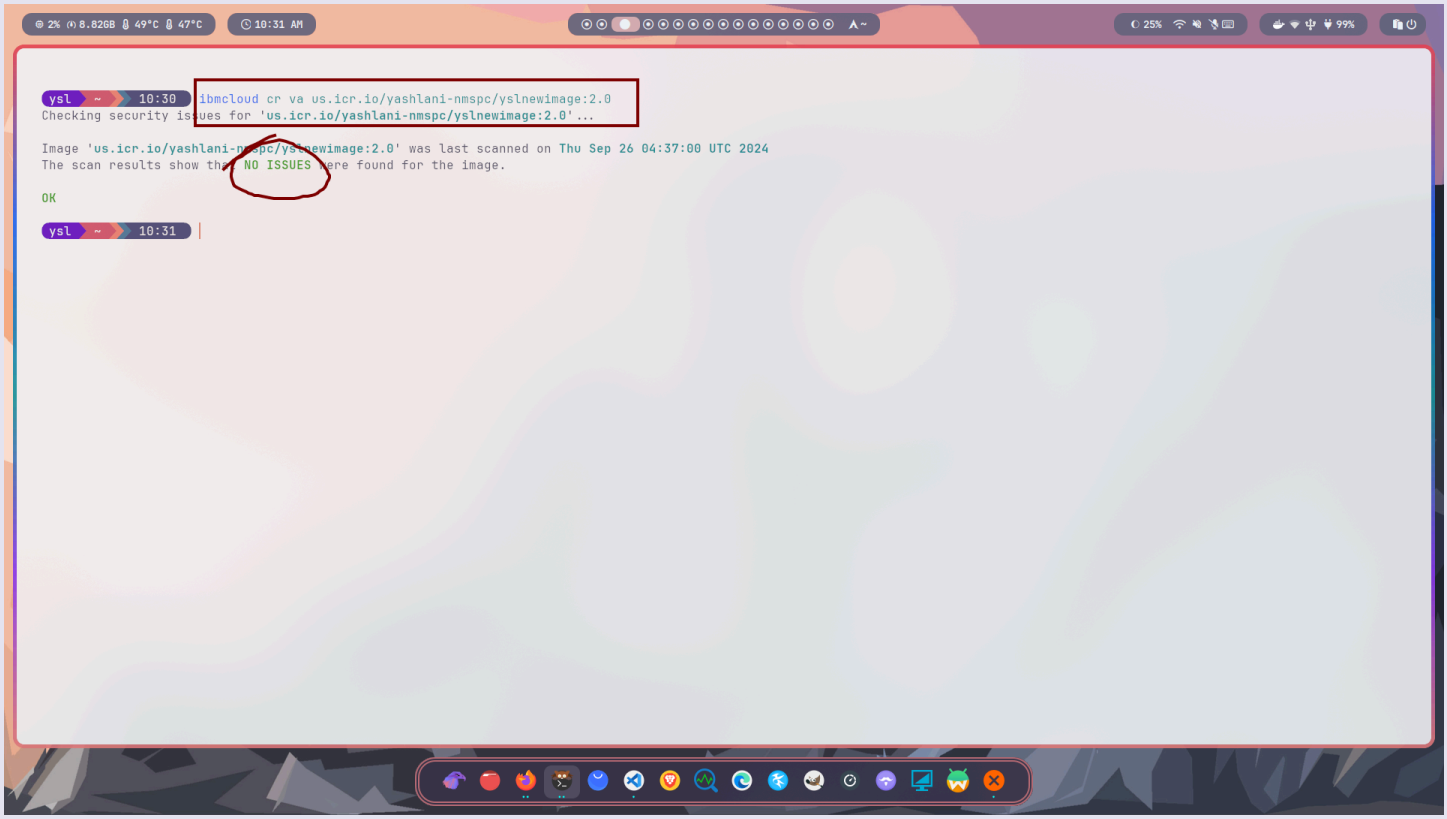
6. Also, it can be checked using cli



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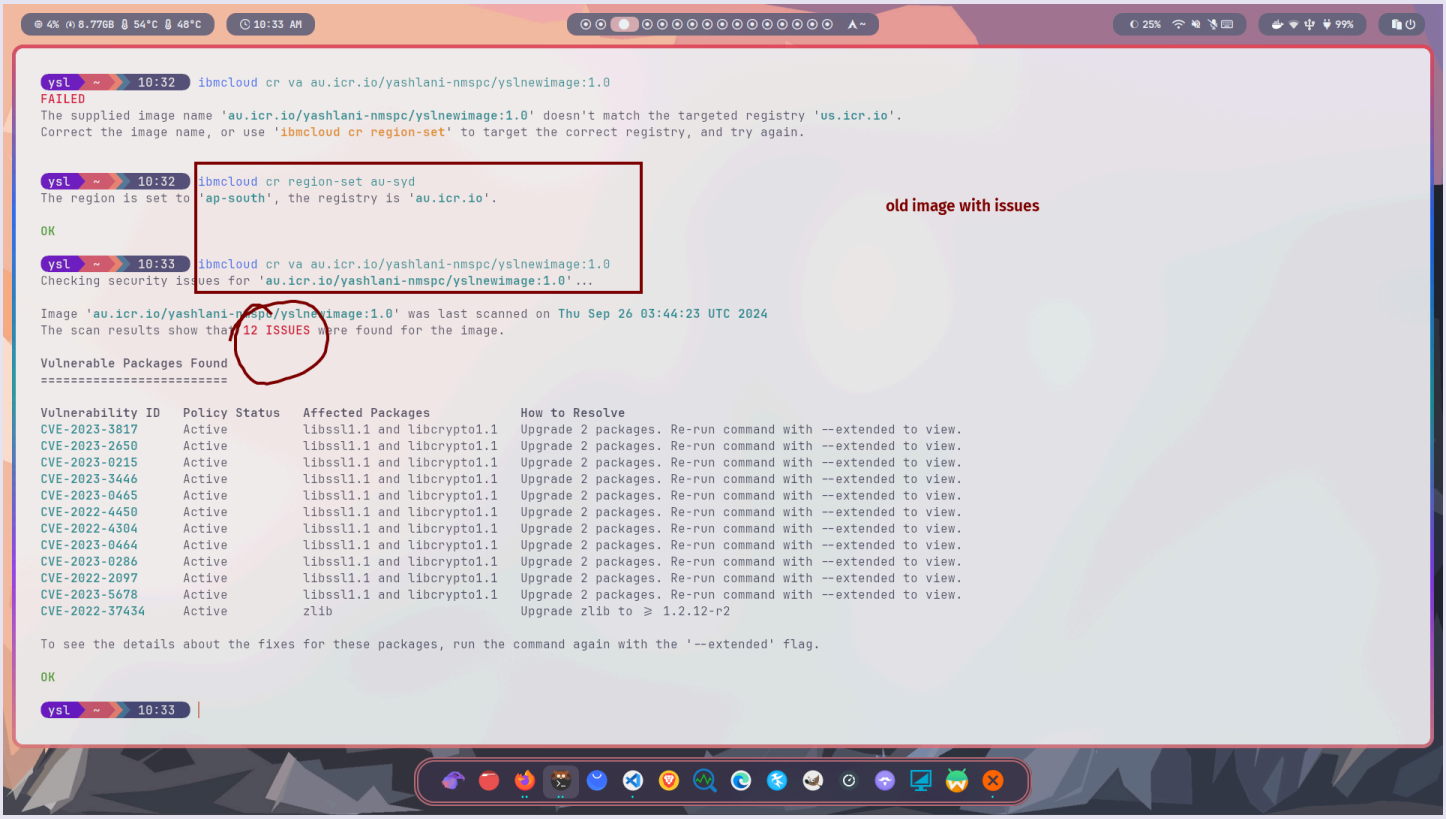
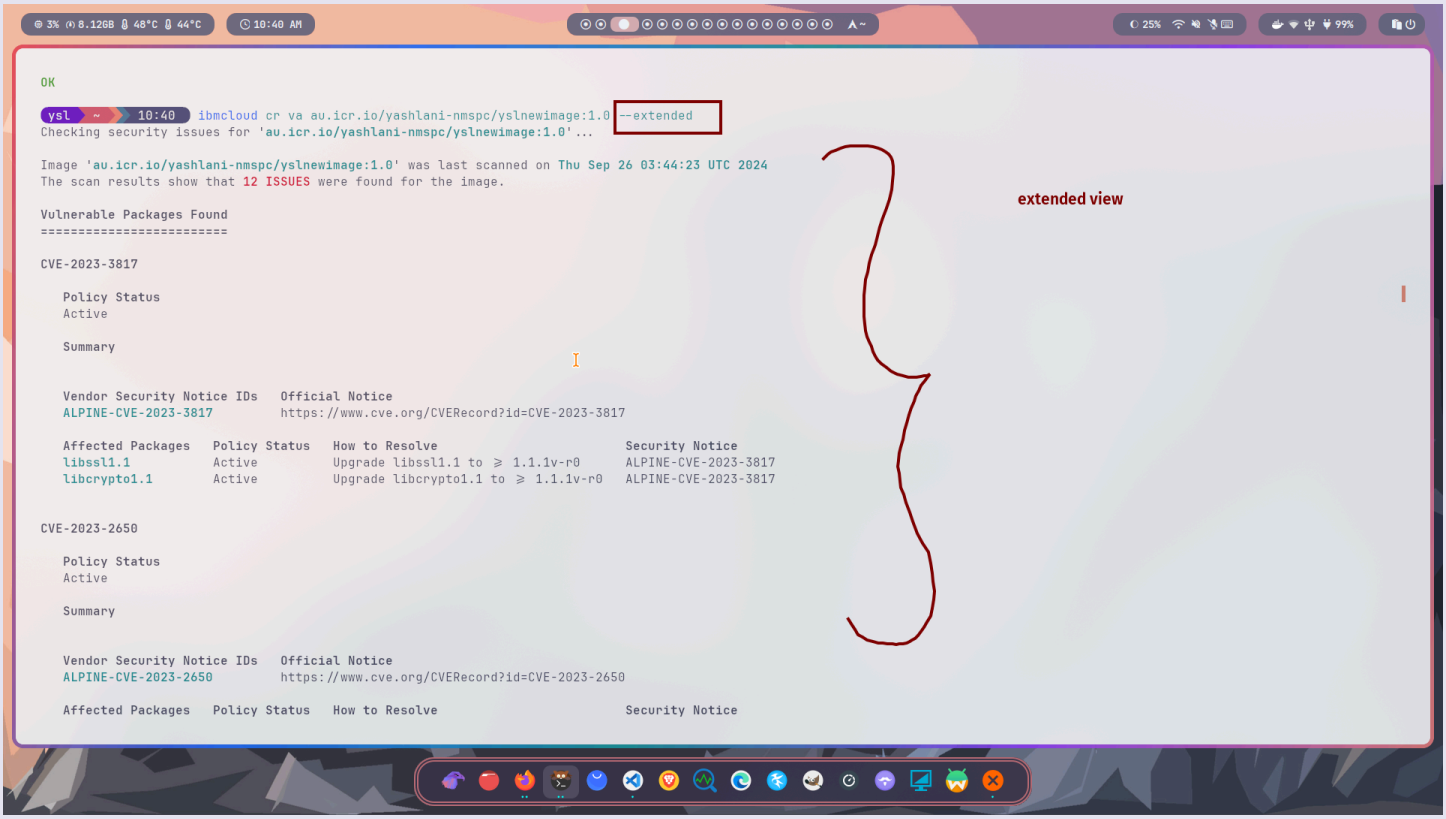



```
ysl ~ 10:32 ibmcloud cr va au.icr.io/yashlani-nmspc/yslnewimage:1.0
FAILED
The supplied image name 'au.icr.io/yashlani-nmspc/yslnewimage:1.0' doesn't match the targeted registry 'us.icr.io'.
Correct the image name, or use 'ibmcloud cr region-set' to target the correct registry, and try again.

ysl ~ 10:32 ibmcloud cr region-set au-syd
The region is set to 'ap-south', the registry is 'au.icr.io'.

OK

ysl ~ 10:33 ibmcloud cr va au.icr.io/yashlani-nmspc/yslnewimage:1.0
Checking security issues for 'au.icr.io/yashlani-nmspc/yslnewimage:1.0'...

Image 'au.icr.io/yashlani-nmspc/yslnewimage:1.0' was last scanned on Thu Sep 26 03:44:23 UTC 2024
The scan results show that 12 ISSUES were found for the image.

Vulnerable Packages Found
=========================

Vulnerability ID   Policy Status   Affected Packages            How to Resolve
CVE-2023-3817      Active          libssl1.1 and libcrypto1.1   Upgrade 2 packages. Re-run command with --extended to view.
CVE-2023-2650      Active          libssl1.1 and libcrypto1.1   Upgrade 2 packages. Re-run command with --extended to view.
CVE-2023-0215      Active          libssl1.1 and libcrypto1.1   Upgrade 2 packages. Re-run command with --extended to view.
CVE-2023-3446      Active          libssl1.1 and libcrypto1.1   Upgrade 2 packages. Re-run command with --extended to view.
CVE-2023-0465      Active          libssl1.1 and libcrypto1.1   Upgrade 2 packages. Re-run command with --extended to view.
CVE-2022-4450      Active          libssl1.1 and libcrypto1.1   Upgrade 2 packages. Re-run command with --extended to view.
CVE-2022-4304      Active          libssl1.1 and libcrypto1.1   Upgrade 2 packages. Re-run command with --extended to view.
CVE-2023-0464      Active          libssl1.1 and libcrypto1.1   Upgrade 2 packages. Re-run command with --extended to view.
CVE-2023-0286      Active          libssl1.1 and libcrypto1.1   Upgrade 2 packages. Re-run command with --extended to view.
CVE-2022-2097      Active          libssl1.1 and libcrypto1.1   Upgrade 2 packages. Re-run command with --extended to view.
CVE-2023-5678      Active          libssl1.1 and libcrypto1.1   Upgrade 2 packages. Re-run command with --extended to view.
CVE-2022-37434     Active          zlib                         Upgrade zlib to ⩾ 1.2.12-r2

To see the details about the fixes for these packages, run the command again with the '--extended' flag.

OK

ysl ~ 10:33
```




```
OK

ysl ~ 10:40 ibmcloud cr va au.icr.io/yashlani-nmspc/yslnewimage:1.0 --extended
Checking security issues for 'au.icr.io/yashlani-nmspc/yslnewimage:1.0'...

Image 'au.icr.io/yashlani-nmspc/yslnewimage:1.0' was last scanned on Thu Sep 26 03:44:23 UTC 2024
The scan results show that 12 ISSUES were found for the image.

Vulnerable Packages Found
=========================

CVE-2023-3817

   Policy Status
   Active

   Summary


   Vendor Security Notice IDs   Official Notice
   ALPINE-CVE-2023-3817         https://www.cve.org/CVERecord?id=CVE-2023-3817

   Affected Packages   Policy Status   How to Resolve                      Security Notice
   libssl1.1           Active          Upgrade libssl1.1 to ⩾ 1.1.1v-r0    ALPINE-CVE-2023-3817
   libcrypto1.1        Active          Upgrade libcrypto1.1 to ⩾ 1.1.1v-r0 ALPINE-CVE-2023-3817


CVE-2023-2650

   Policy Status
   Active

   Summary


   Vendor Security Notice IDs   Official Notice
   ALPINE-CVE-2023-2650         https://www.cve.org/CVERecord?id=CVE-2023-2650

   Affected Packages   Policy Status   How to Resolve                      Security Notice
```

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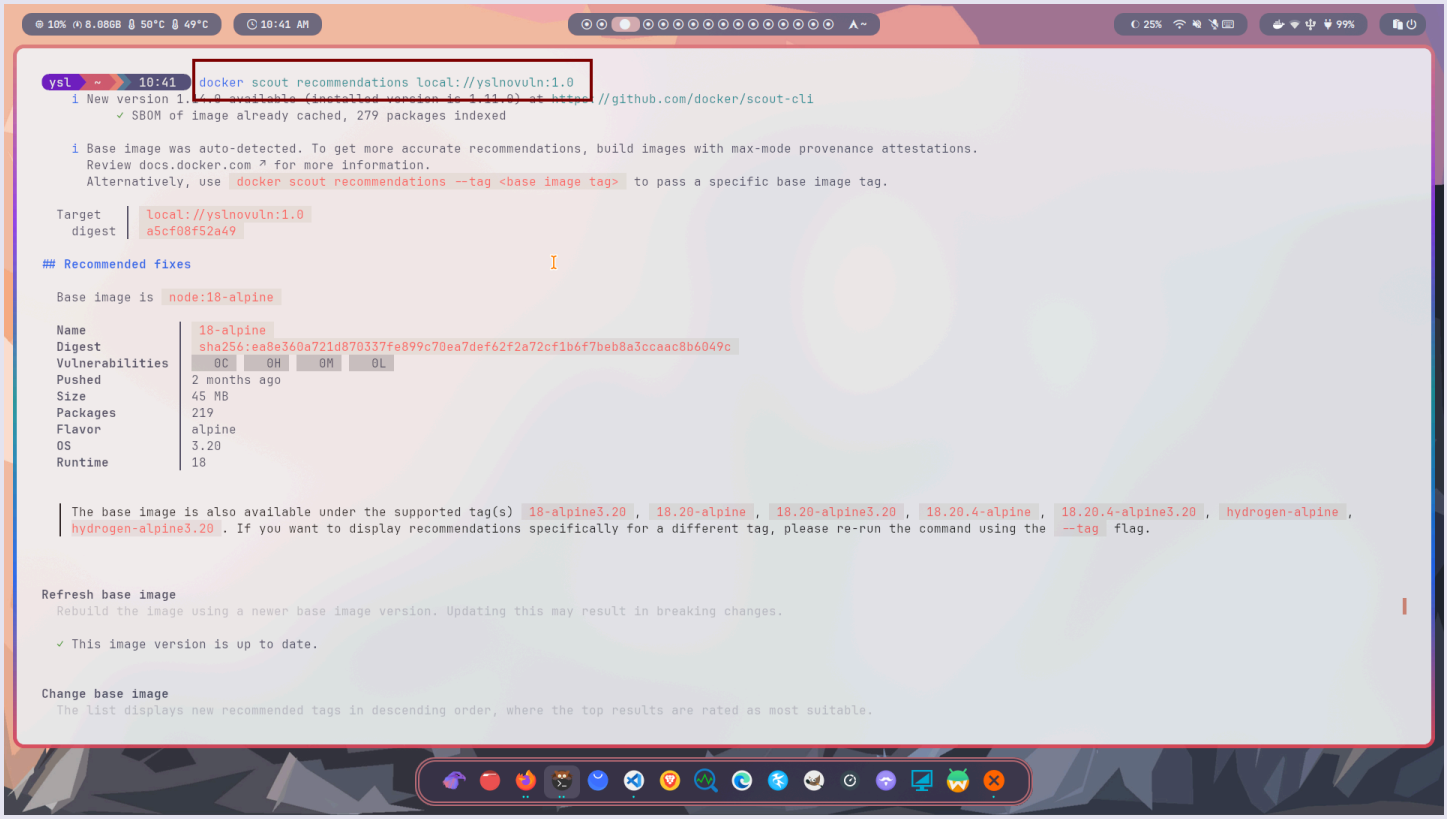
7. Also, docker has its own component, SCOUT to check vulnerability



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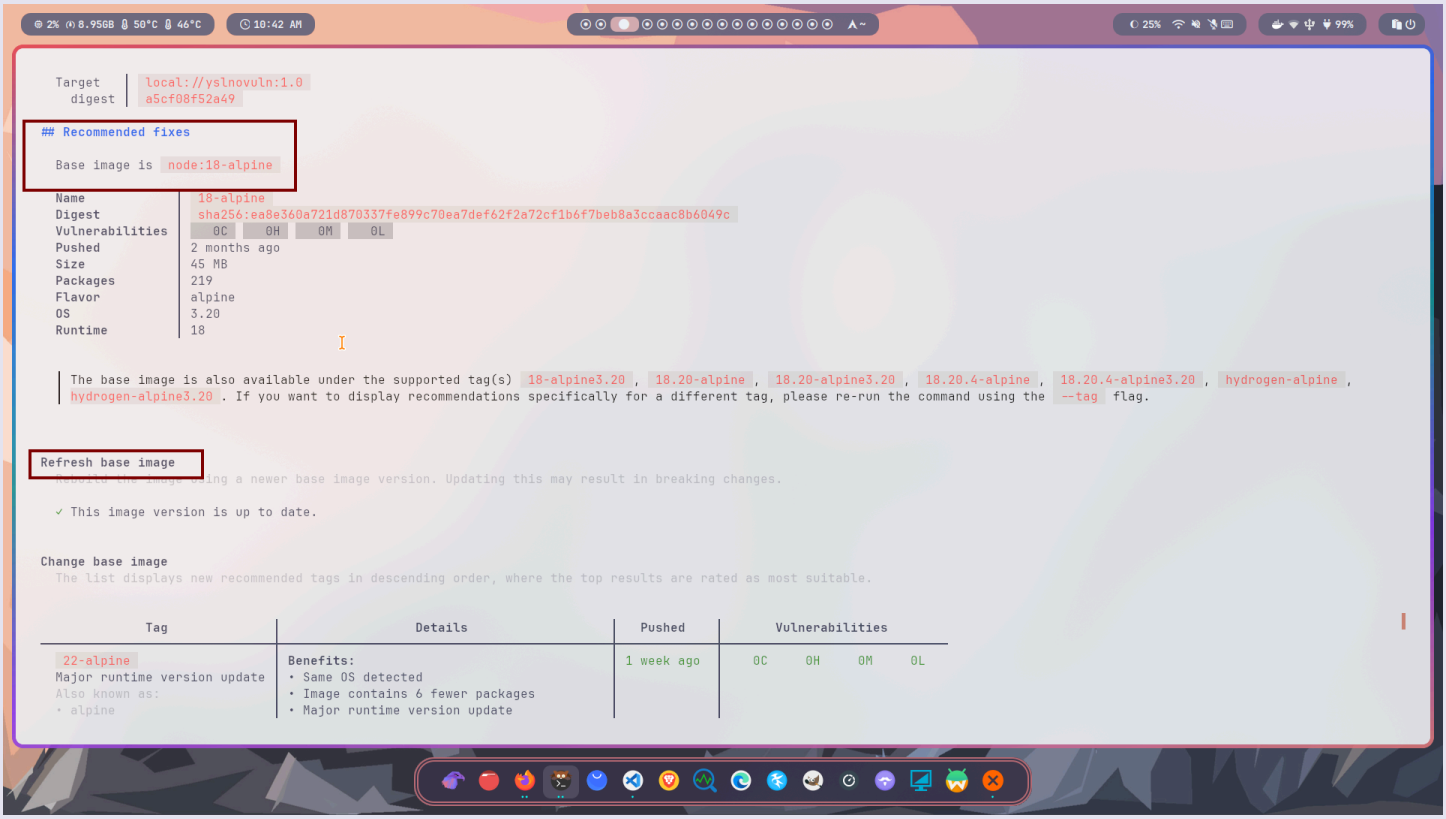

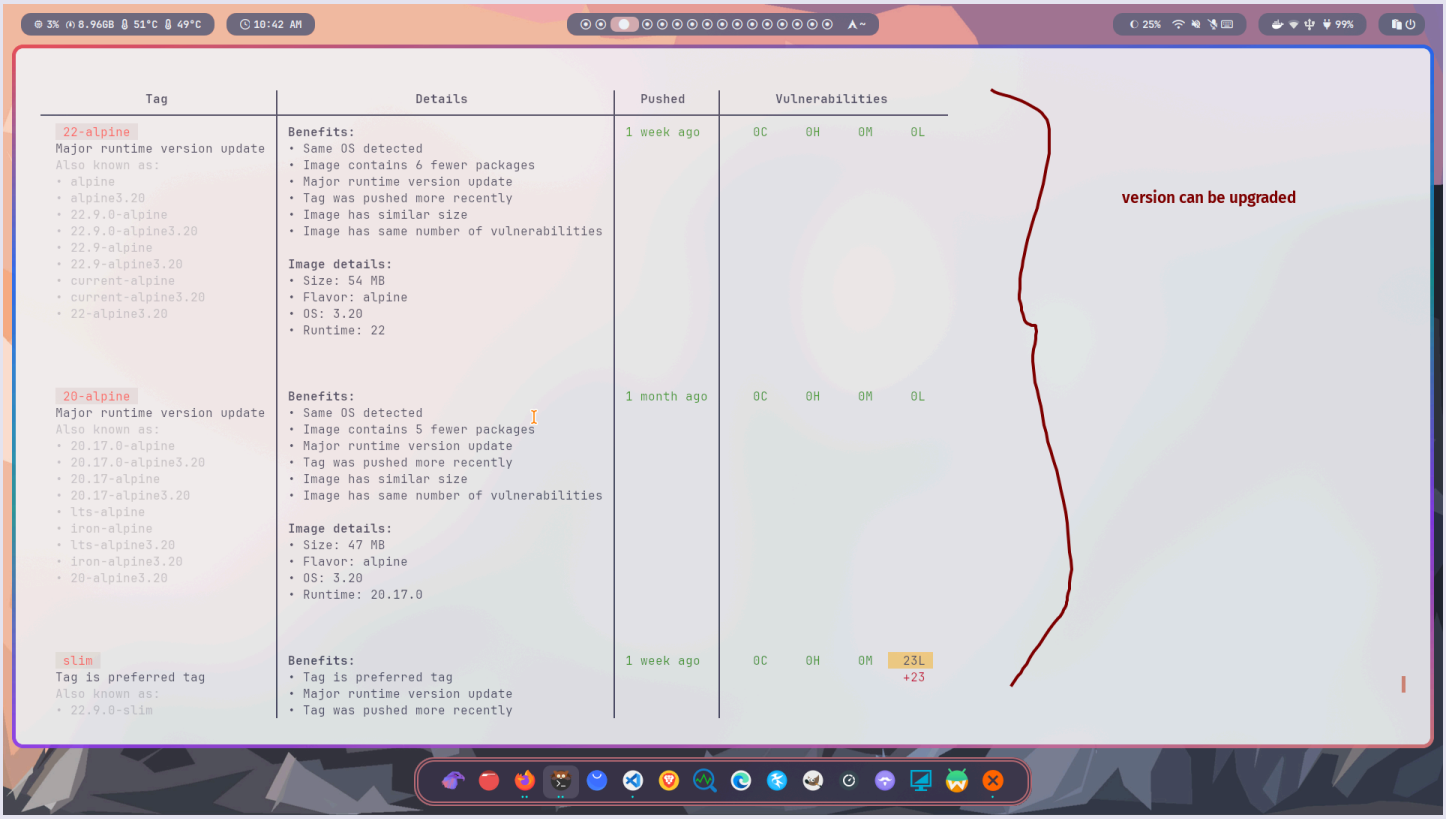

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