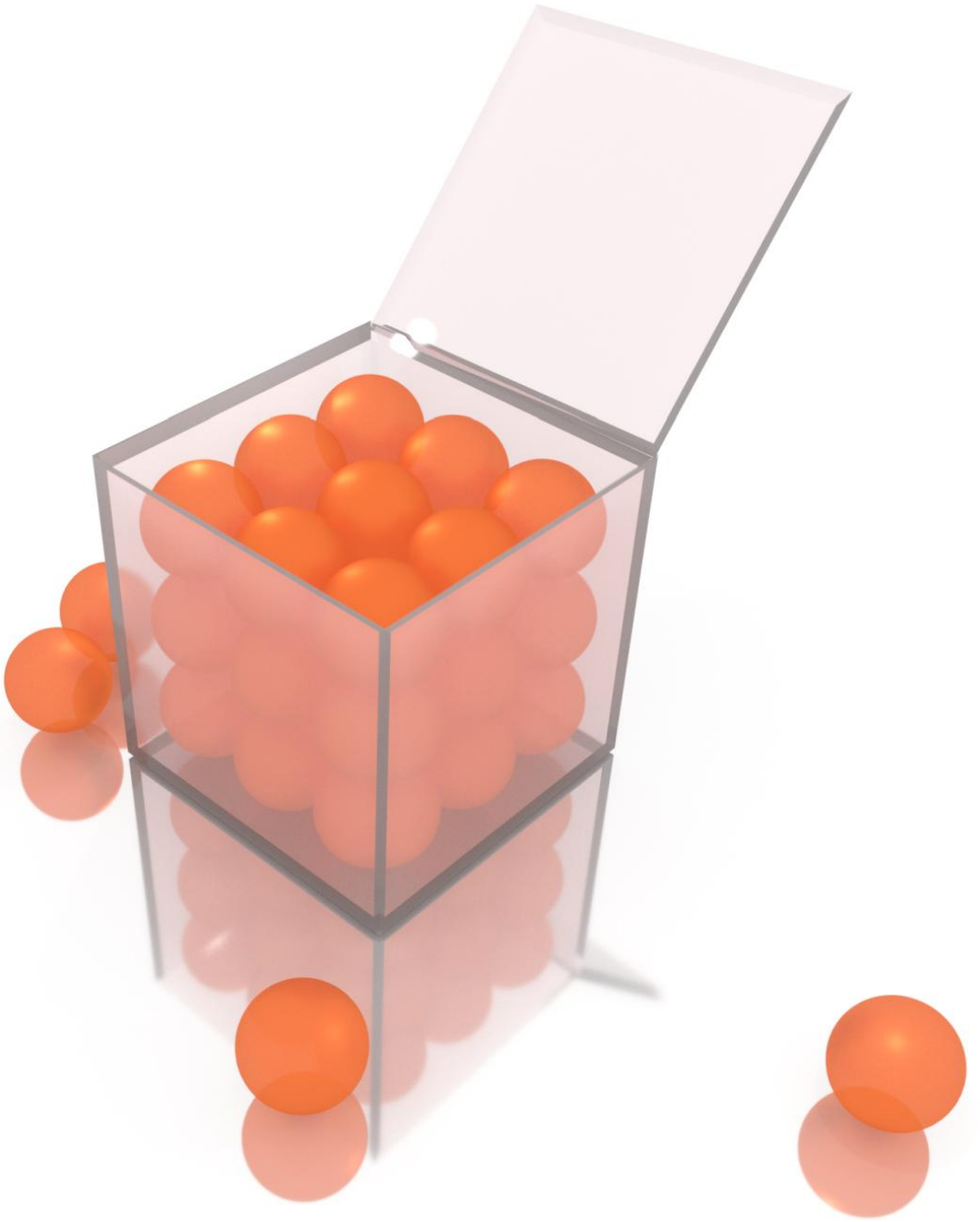
ZEROPORTAL

Zero-Time App delivery



Quick installation guide

App content

ZeroPortal

The ZeroPortal is a central component for distributing virtual application packages and is intended as a possible replacement for the Microsoft App-V Publishing Server. It enables the efficient distribution, updating and management of virtualized applications in corporate environments without having to install the applications on each client in the traditional way. In addition, ZeroPortal offers functions for App-V reporting that extend the original potential of the Microsoft App-V Publishing Server.

Why ZeroPortal?

- Centralized application deployment:
- ZeroPortal maintains a repository (package store) of all virtualized applications and makes them available to end devices in zero time.
- Push and pull provisioning:
  - Push mode: The server actively instructs clients to stream or install certain applications.
  - Pull mode: Clients retrieve the packages as required.
- Integration in Active Directory:
- Group Policy (GPO) policies can be used to control access permissions and deployment rules per user/computer group.
- Versioning & updating:
- New versions of application packages are simply stored in ZeroAppServer; clients recognize and load updates automatically or on schedule.
- Compatible with the Microsoft App-V Client PowerShell CmdLets

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Restrictions

- No high availability in the current version (development from fall 2025)
- Not all functions 100% adopted yet. CmdLets and, for example, automatic transfer of AD groups to new package versions are missing. Development from fall 2025.

Technical background

- MariaDB as embedded DB solution for each node (HA later via DB replication).
- Use of dotnet Core and open source libraries to enable later use under Linux or in Docker.

What is zero app deployment?

Zero deployment time is achieved through the streaming principle of App-V and other virtualization solutions. There is no need for a classic installation:

- **Immediate launch capability:**
  Clients do not need to download the entire package in advance. Already loaded start components are sufficient to start the application within seconds or it can be started directly from the network.

- **Minimal waiting time:**
  Instead of a full file download and conventional installation (which often takes minutes), users can start working with the app virtually immediately.
- **Bandwidth optimization:**
  Only the parts that are actually needed are transferred at startup. The remaining package content follows in the background, which protects the network and does not slow users down.
- **Scalability in the enterprise environment:**
  With large numbers of users or distributed locations, the server and network load remains low as clients themselves control which parts they request and when.
- **Fast rollouts & updates:**
  New versions can go live immediately. Clients start the new version immediately after retrieving the metadata once, without the need for another full download.

Requirements

- ⇨ MariaDB (alternatively MySql)
- ⇨ Dotnet Core Asp.Net 8.x
- ⇨ aspnetcore-runtime-8.x

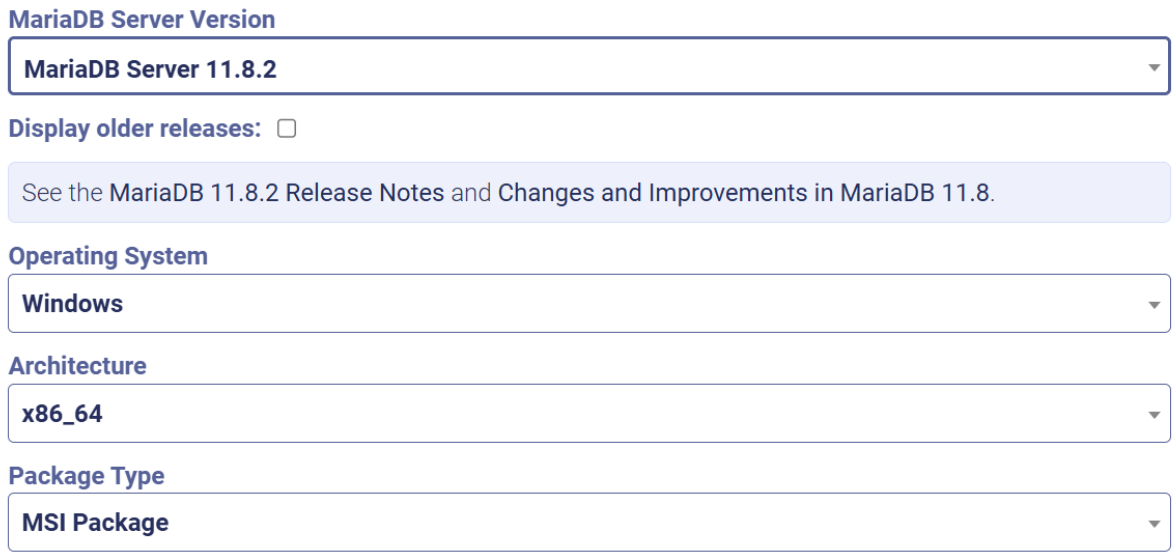
Installation of

Installation MariaDB or alternatively MySql

For the time being, installation is only possible under Windows.

Basic installation MariaDB (Version 11.x)

Download here:
https://mariadb.org/download

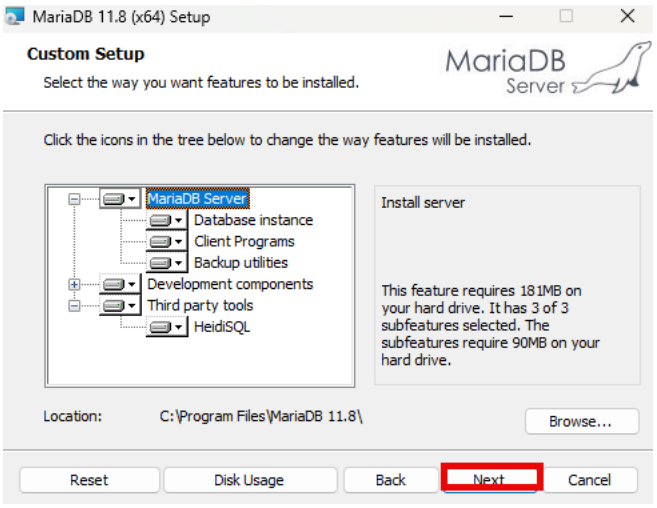


- ⇨ Installation with standard parameters.
- ⇨ Install as a service
- ⇨ **ATTENTION:** Set and note the root password during installation. You can also create your own accounts for the web application's DB if you do not want it to run under "root".

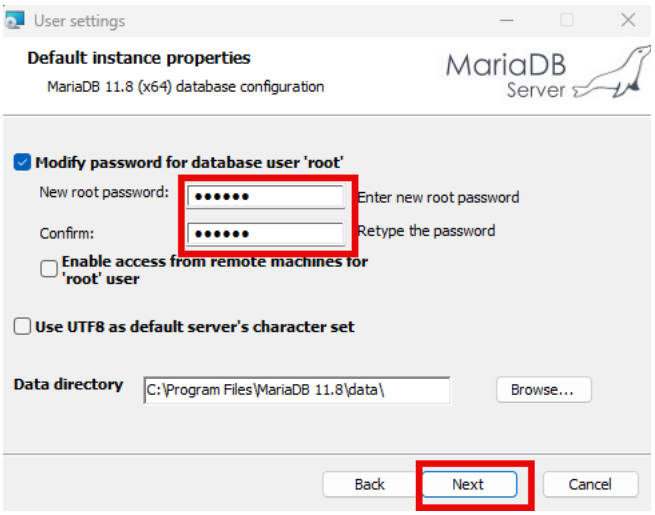
Note:

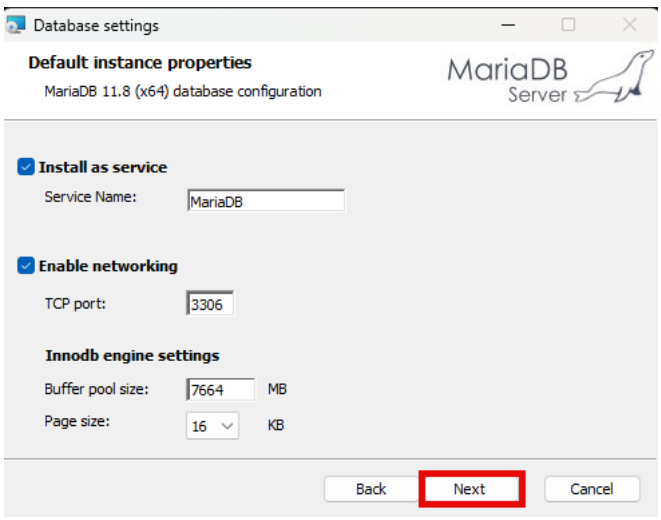
- ⇨ Access is only possible from "Localhost", open the local firewall if necessary.
- ⇨ Recommended antivirus exclusions:
  MySQL main directory - <Drive>:\mysql\
  MySQL Temporary Files - Uses the Windows system default, which is usually C:\windows\temp\
- ⇨ Test access to the DB with the enclosed tool "Heidi".

The following is the installation:

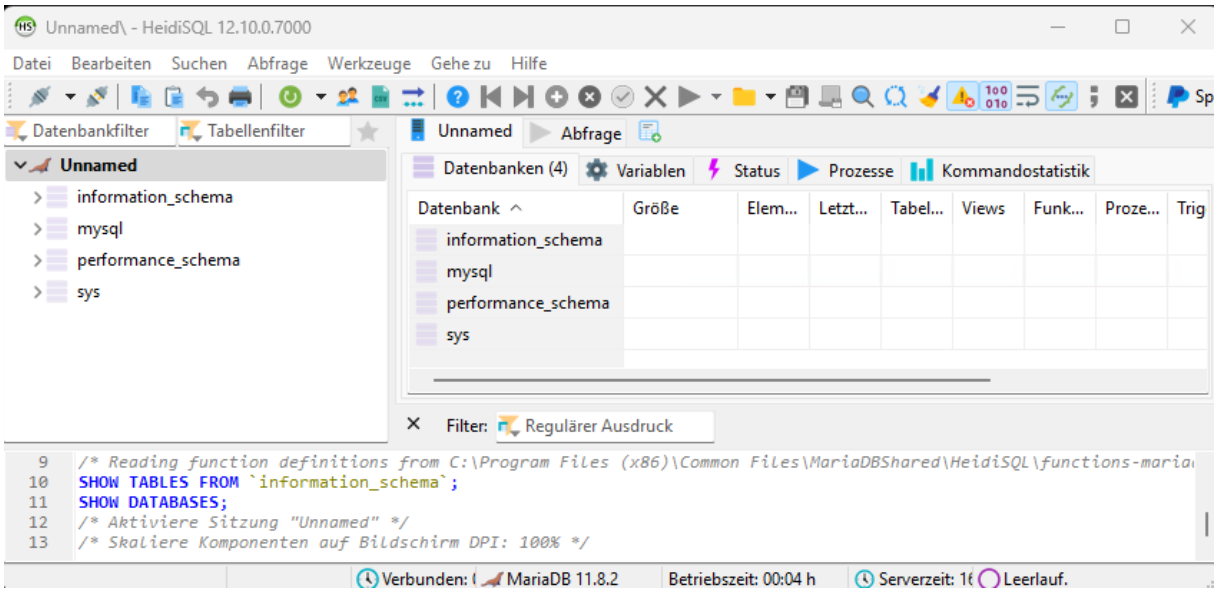


Please set the root password and make a note of it. Theoretically ZeroPortal can also work under a different user. Then an empty database must be created beforehand and also the user account. We only allow local access, so it is probably not a serious security problem if ZeroPortal runs directly under "root".





It is installed with MariaDB HeidiSQL. This tool can be used later to check if the database was created correctly!



Installation Dotnet Core 8.0

The download can be found at the following URL.

Download .NET 8.0 (Linux, macOS, and Windows) | .NET

You will need:

- ASP.NET Core Runtime (x64)
- DotNet Desktop Runtime (X64)

Alternatively, the hosting package can also be downloaded. Especially if the application is not to run on the built-in web server but on the IIS. The hosting package is necessary.

Run apps - Runtime ⓘ

ASP.NET Core Runtime 8.0.17

The ASP.NET Core Runtime enables you to run existing web/server applications. **On Windows, we recommend installing the Hosting Bundle, which includes the .NET Runtime and IIS support.**

IIS runtime support (ASP.NET Core Module v2)
18.0.25136.17

OS	Installers	Binaries
Linux	Package manager instructions	Arm32 | Arm32 Alpine | Arm64 | Arm64 Alpine | x64 | x64 Alpine
macOS		Arm64 | x64
Windows	x64 | x86 | Arm64 | Hosting Bundle | winget instructions	x64 | x86 | Arm64

.NET Desktop Runtime 8.0.17

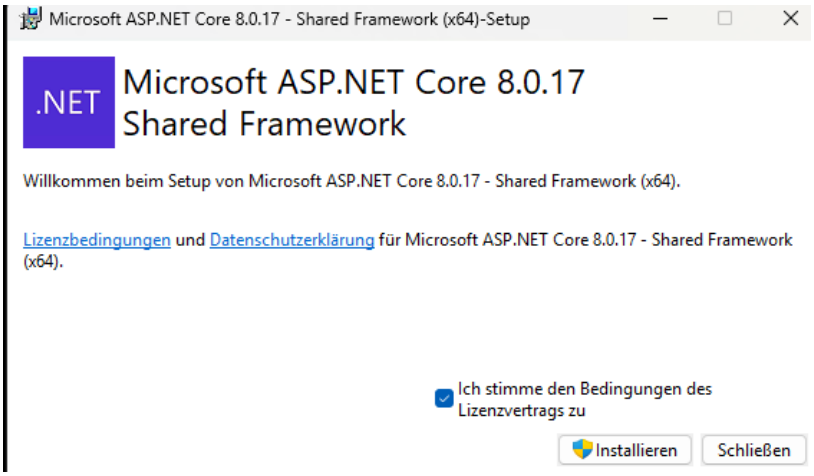
The .NET Desktop Runtime enables you to run existing Windows desktop applications. **This release includes the .NET Runtime; you don't need to install it separately.**

OS	Installers	Binaries
Windows	x64 | x86 | Arm64 | winget instructions	

After installing the runtimes, the ZeroPortal package is installed.

- aspnetcore-runtime-8.x.x-win-x64.exe - install with the default settings.
- Install windowsdesktop-runtime-8.x.x-win-x64.exe with the default settings.

Example of a dialog for the two installations.

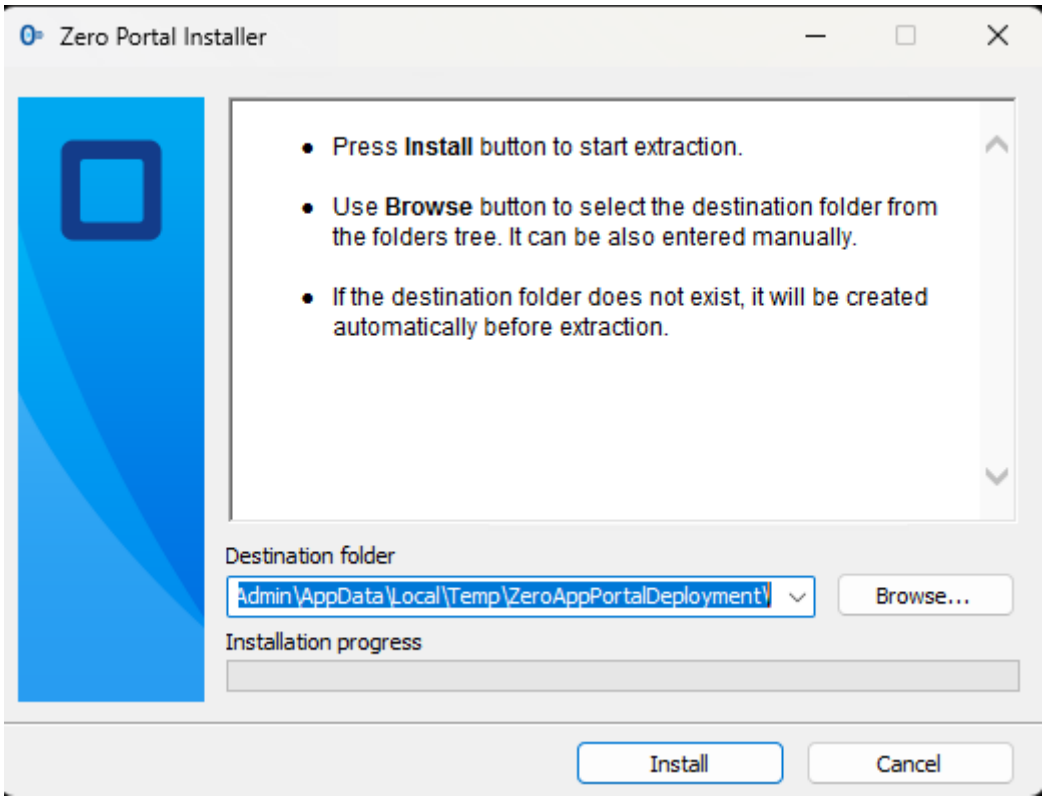


Installation MariaDB

ZeroPortal server installation

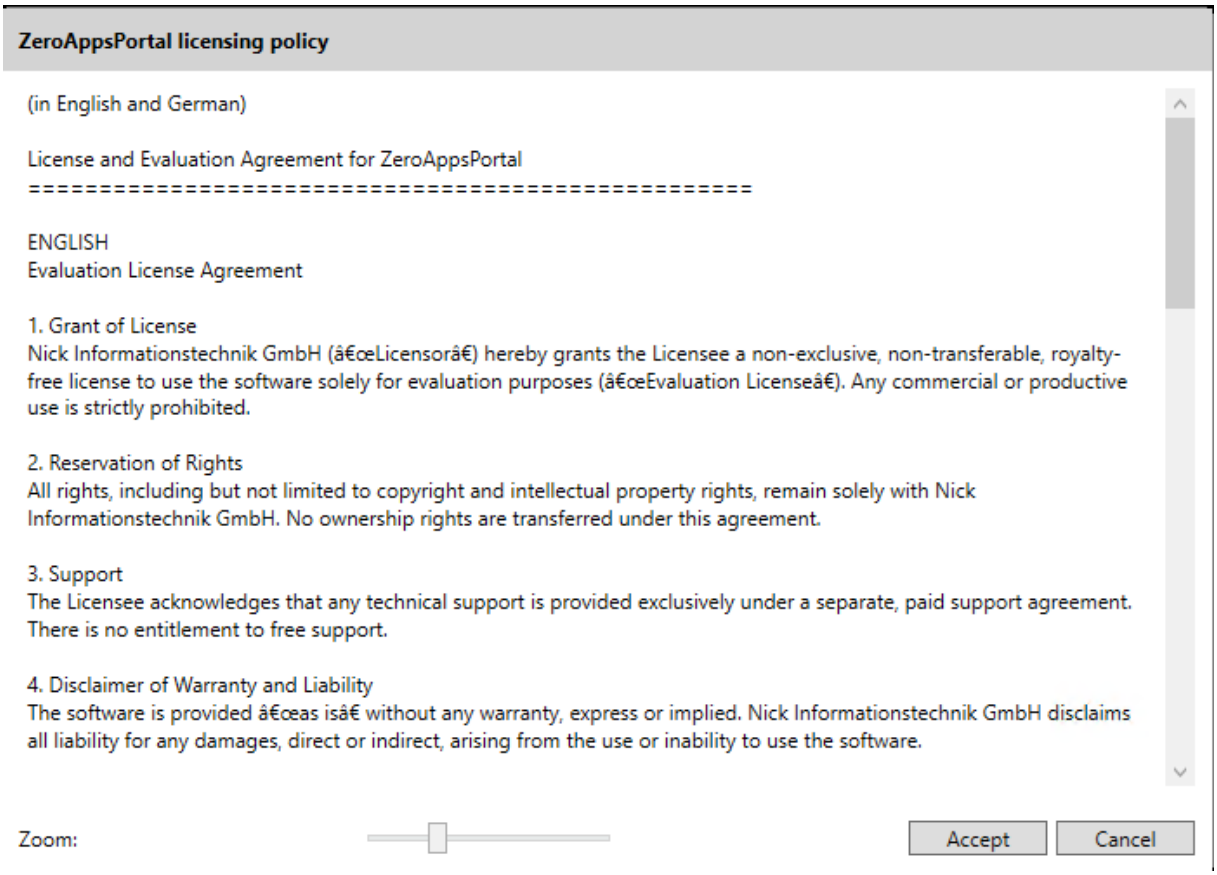
The installer is currently based on the PSADT and a self-extracting archive. Please install the requirements first.

1. Start the file "ZeroPortalInstaller.exe"
2. All files are first extracted to a temp folder

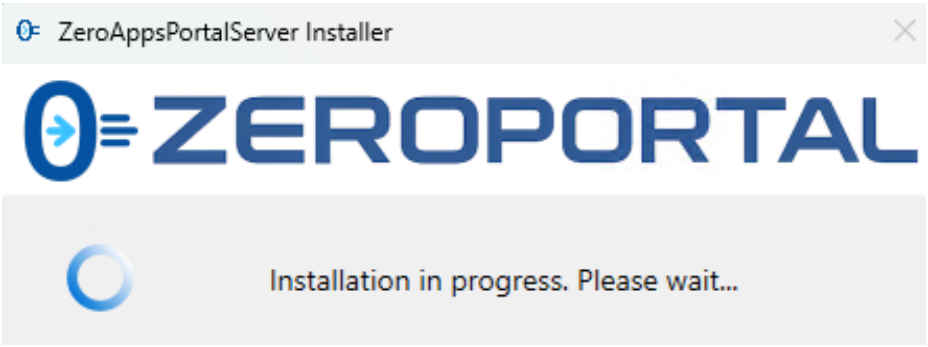


3. Then an installer based on the PowerShell Deployment Toolkit starts with admin rights.
4. ATTENTION: It may take some time from here. Please wait.

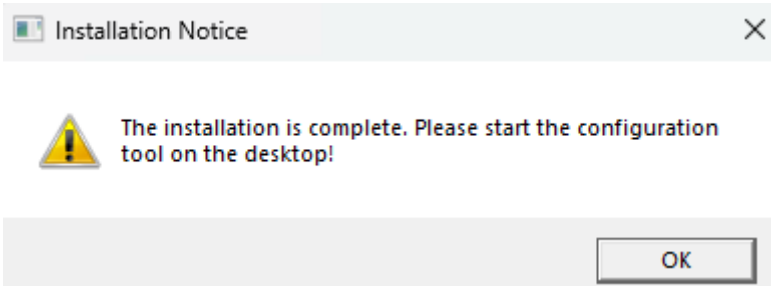
5. Read the license terms and accept them if you want to install. The text is in German and English.



6. It will be installed



7. When the installation is complete, you will receive further information:



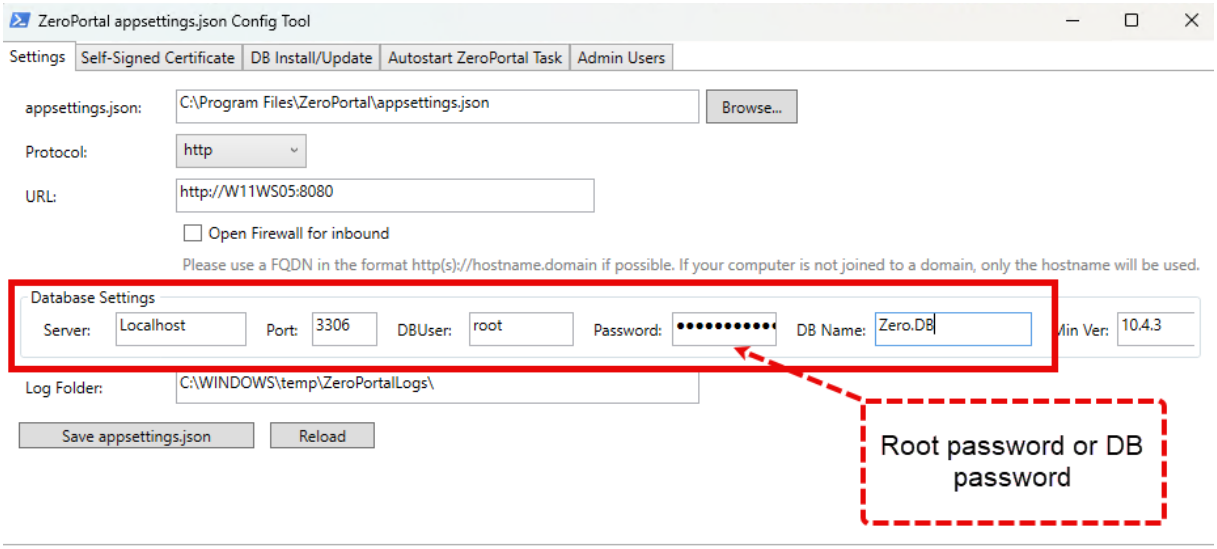
A file with the release notes opens!

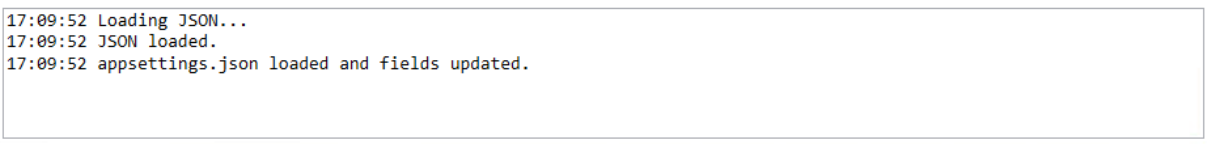
Server configuration of the ZeroPortal server

The configuration is essentially done via the appsettings.json file under "C:\Program Files\ZeroPortal". This is a slightly extended standard Microsoft Asp.net Core configuration file for the integrated Krestel web server.

Start "ZeroPortalConfigTool" on the desktop or in the start menu.

1. Access data for the SQL server.
   Normally only the root password needs to be entered here. A separate instance may also work. Then specify the name of the DB. No other settings need to be changed.



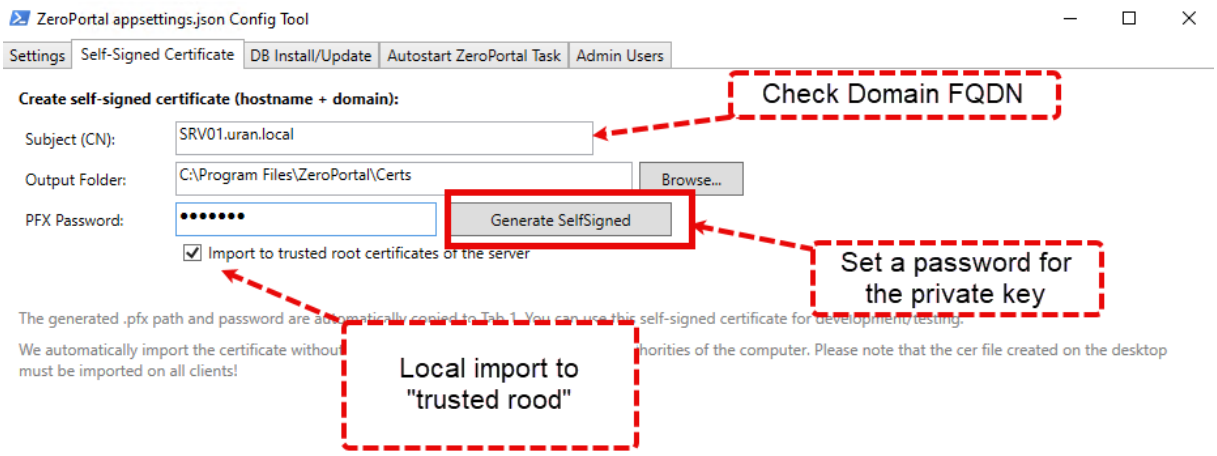


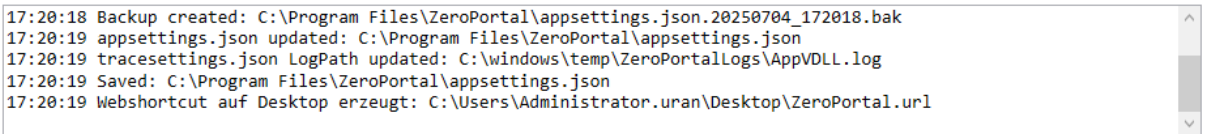
2. Save with "Save appsettings.json".

```
},
"ConnectionStrings":  {
  "ZeroDB": "Server=Localhost;port=3306;User ID=root;Password=mypass;Database=Zero.DB"
},
```

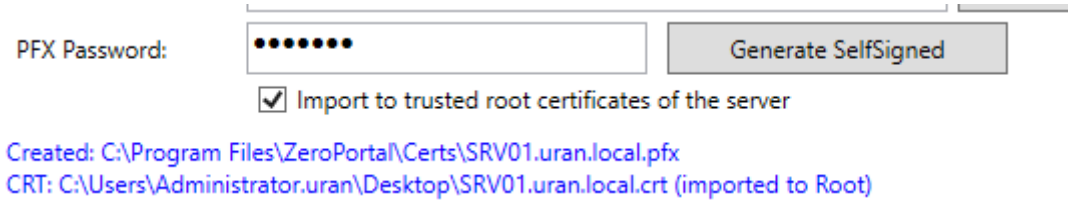
Make sure that the data in the json file corresponds to the change.

3. **Recommended:** Create a self-signed certificate or your own certificates. You can also use a PFX certificate from your company CA.

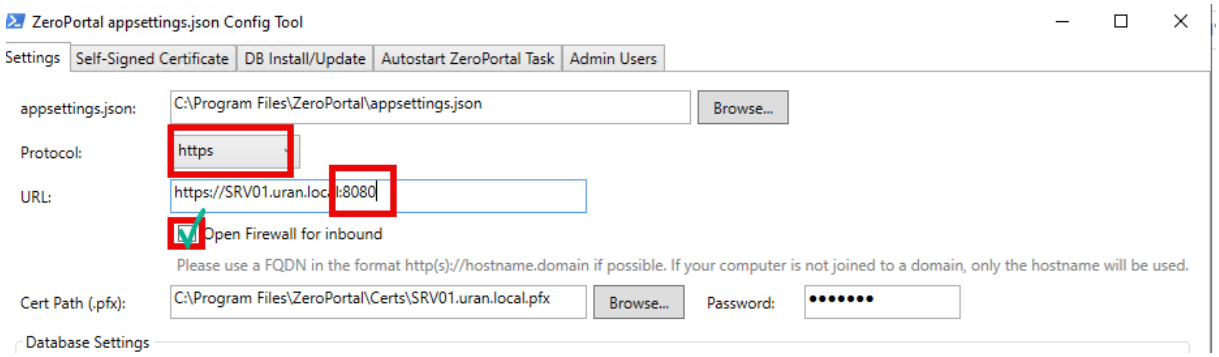




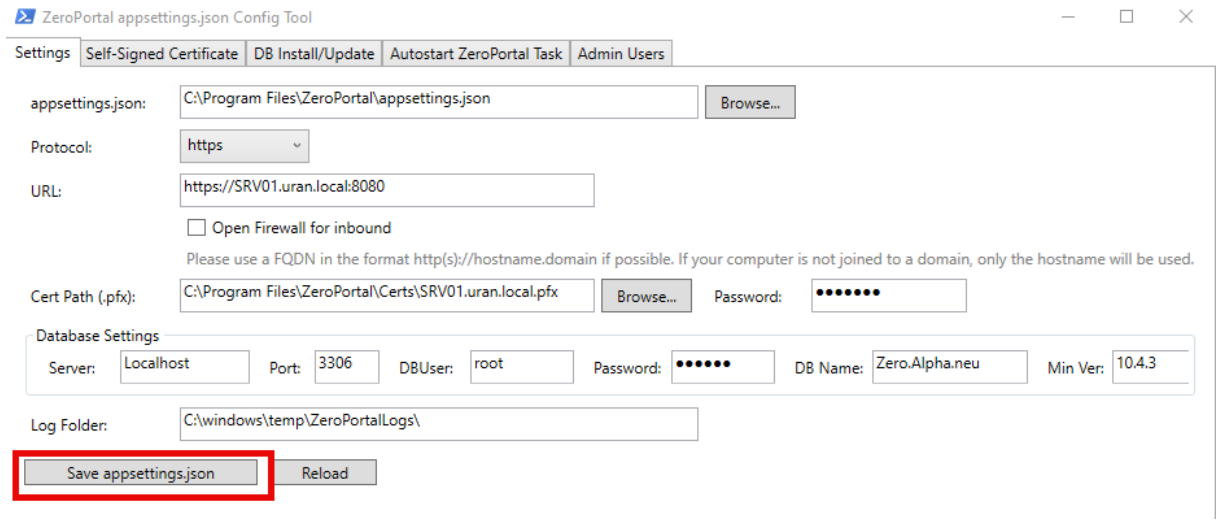
4. Set a password for the private key. Check the FQDN of the server. It is best to have the certificate imported automatically.
   Attention, this happens every time you click on "Generate SelfSigned". Certificates then accumulate on the computer!
5. There is a response and the server automatically switches to https:



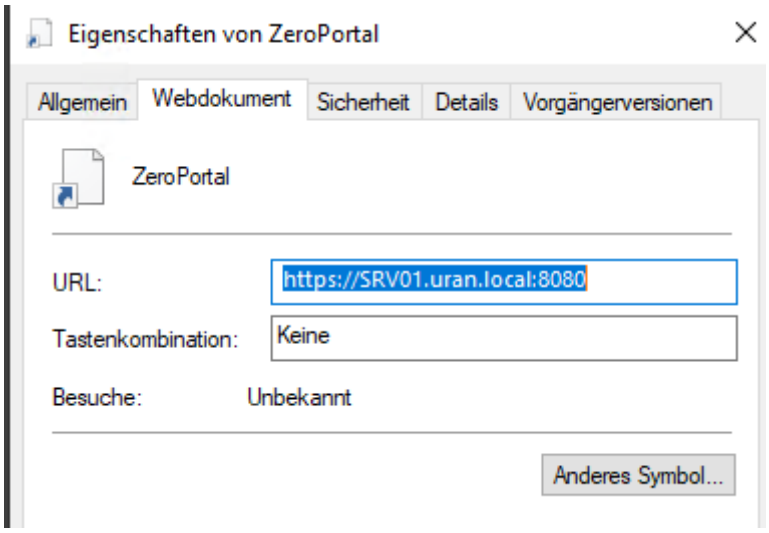
6. A certificate without a private key is automatically created on the desktop when the Self Signed certificate is generated (here SRV01.uran.local.cer). This certificate must be installed on the client side!
7. Now you have the possibility to adjust the server data and the port under which ZeroPortal runs:



8. Save again with "Save":



9. A "ZeroPortal" shortcut with the server URL is created when saving on the desktop. If the data is not correct, it is best to delete the icon once.

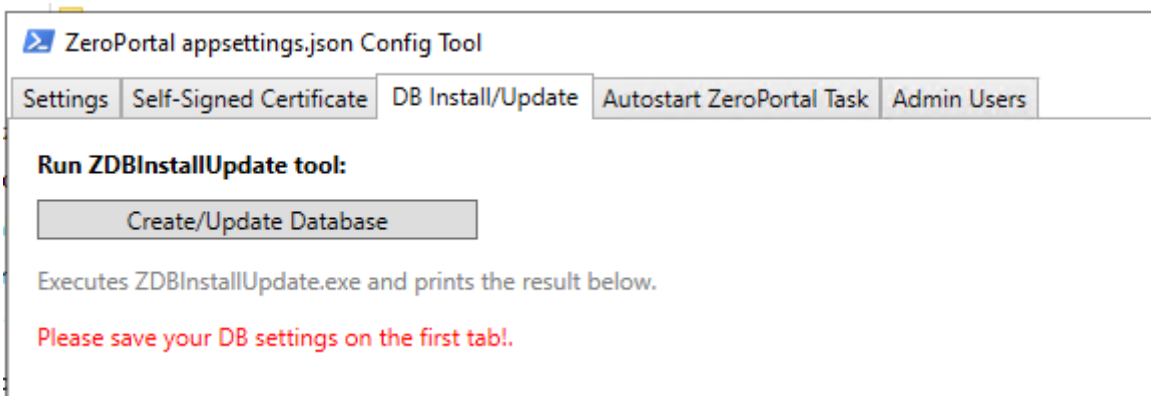


In the Appsettings.json the data is entered as follows:

```
{
  "Kestrel":  {
    "Endpoints":  {
      "Https":  {
        "Url": "https://SRV01.uran.local:8080",
        "Certificate":  {
          "Path": "C:\\Program Files\\ZeroPortal\\Certs\\SRV01.uran.local.pfx",
          "Password": "mypass+"
        }
      }
    }
  }
```

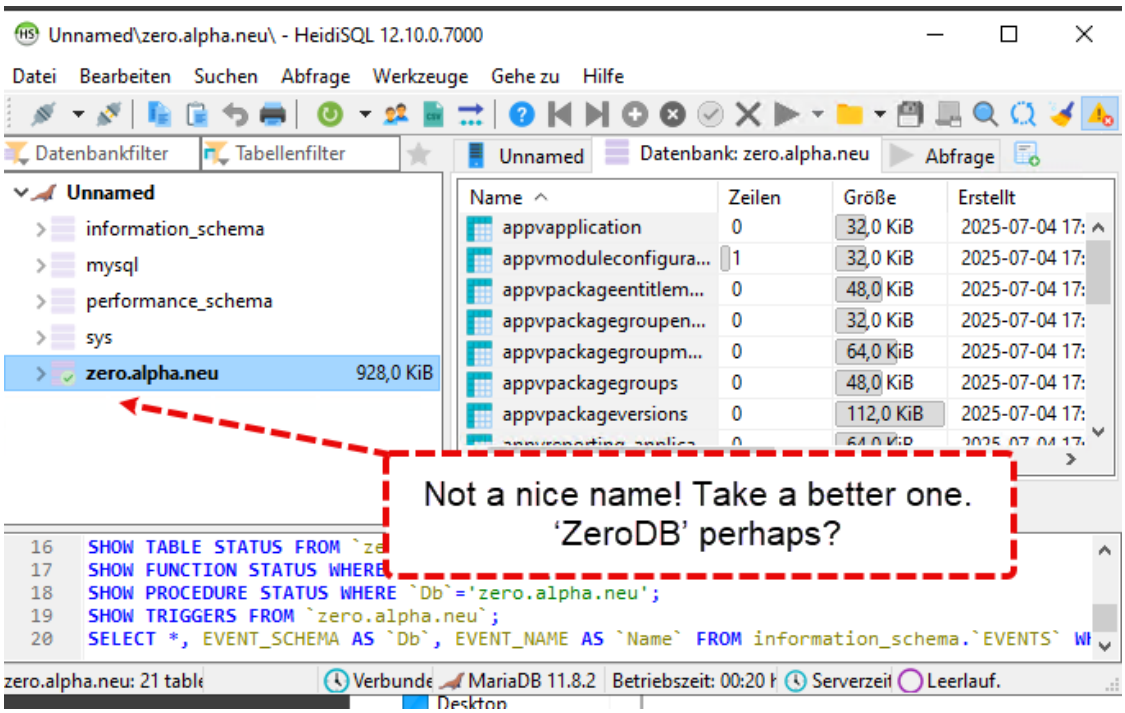
Create (or update) the database

To do this, click on "Create/Update Database" under "DB Install/Update".



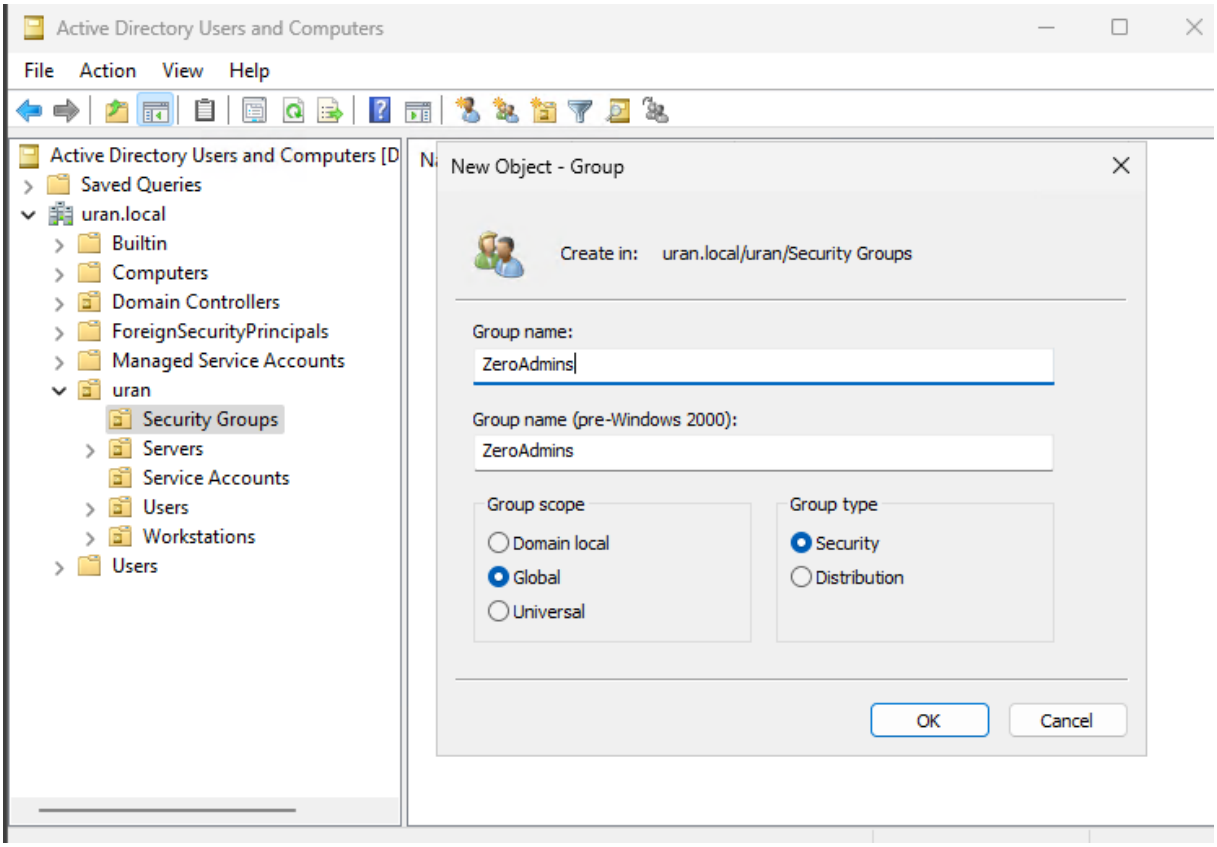
If all data is correctly stored in the connection configuration, we will receive a positive response.

```
Parsed server version: 11.8.2
Database 'Zero.Alpha.neu' ensured existence.
Starting database migration...
Database migration completed successfully.
```



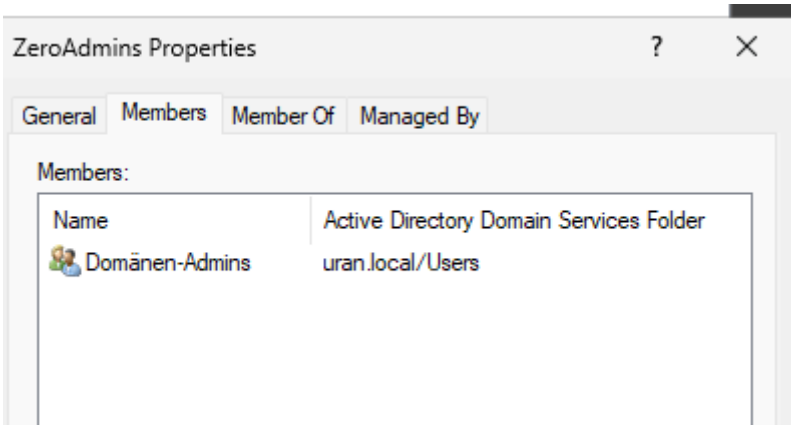
Configuration of the admin group

Not everyone is allowed to administer! Create an AD group with people who are allowed to administer the ZeroPortal.

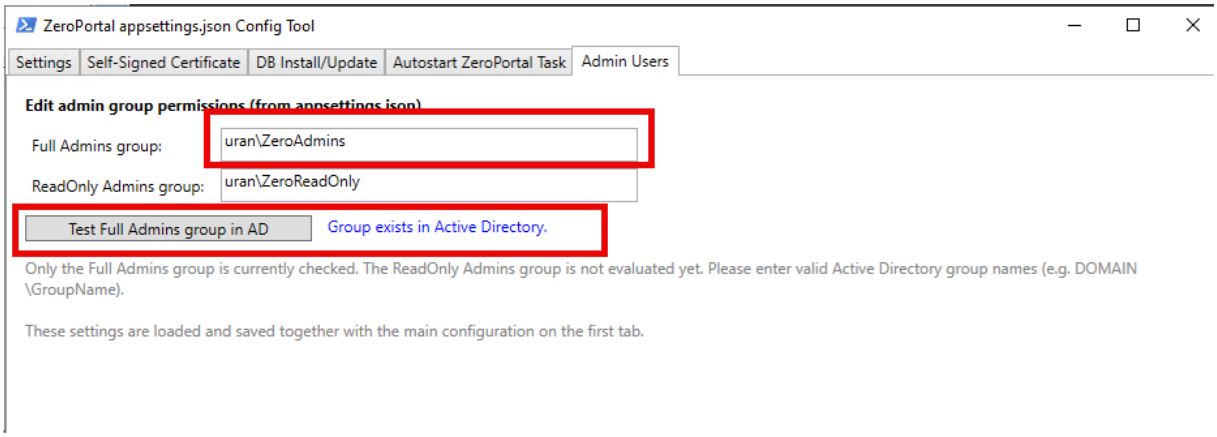


Here this is the group "ZeroAdmins"

Add the users who are to administer:



Enter the group with the domain in the last "Tab" and check with "Test". Then save again with "Save appsettings.json". ReadOnly Admins are currently not implemented.



The entries are created under AccessGroups in the appsettings.json.

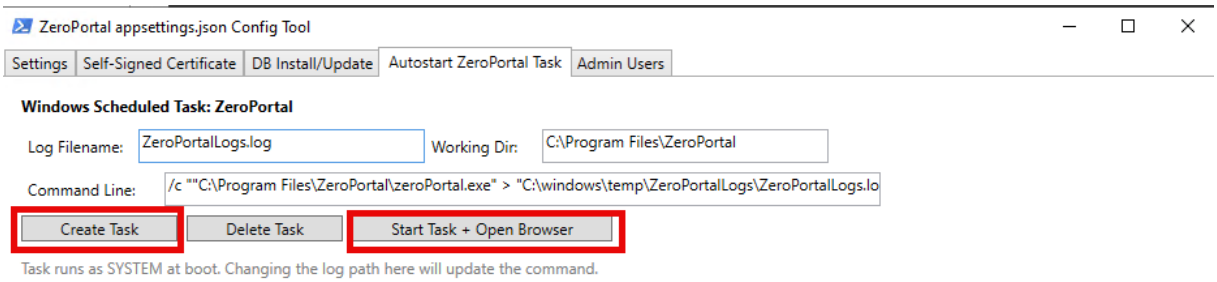
```
},
"AccessGroups":  {
  "FullAdmins": "uran\\ZeroAdmins",
  "ReadOnlyAdmins": "uran\\ZeroReadOnly"
},
```

Automatic start of the ZeroPortal

Theoretically, the ZeroPortal can be started by starting ZeroPortal.exe. However, the start is easier solved via a ScheduledTask. A function is stored in the configuration tool for this purpose. The data is set automatically. We can create the task here but also delete it again. The log directory is taken over and set by an output redirection.

If there are any problems, please take a look at the logs. Caution: The logs are partially overwritten with a restart.

1. Create a scheduled task for the auto start
2. You can then test whether everything is working with "Start Task + Open Browser". Otherwise the task will only start after a restart.

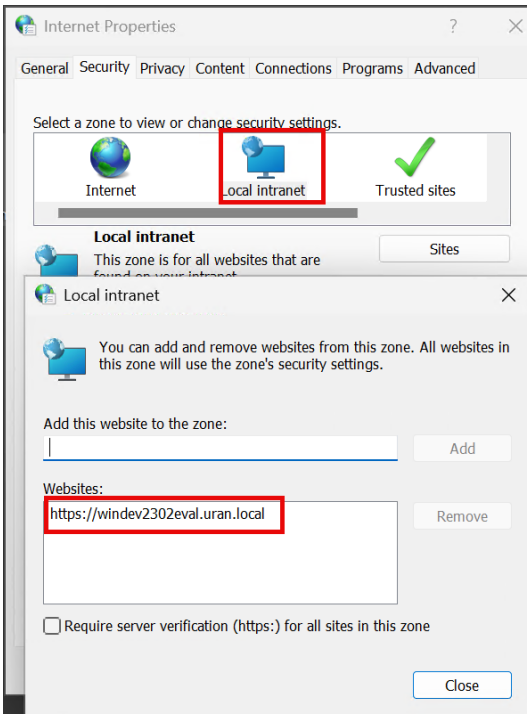


This is stored like this:

/c ""C:\Program Files\ZeroPortal\zeroPortal.exe" > "C:\windows\temp\ZeroPortalLogs\ZeroPortalLogs.log" 2>&1"

Default log directory: C:\windows\temp\ZeroPortalLogs\

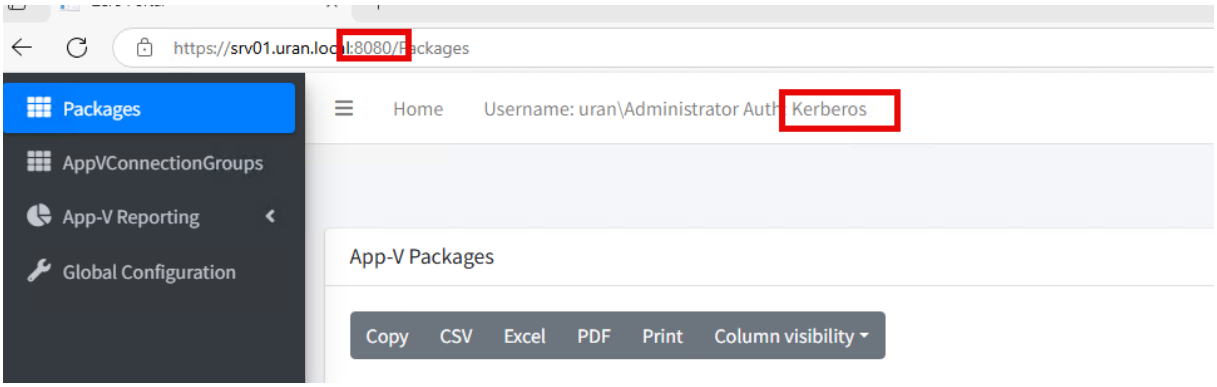
The server may still need to be added to the intranet sites. See the client installation.



Furthermore, a new login is necessary if the administrative user has just been added to the group of ZeroPortal administrators, as the Kerbero ticket is only updated with a new login.

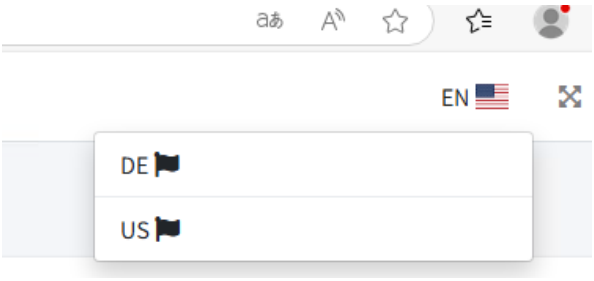
The configuration tool can be closed. It is best to test the login from a dedicated system. First edit the "Intranet Sites" and import the certificate.

NOTE: Do not forget to open the firewall for the ZeroPotal server port. This can be done automatically in the configuration tool (checkbox in the first tab):



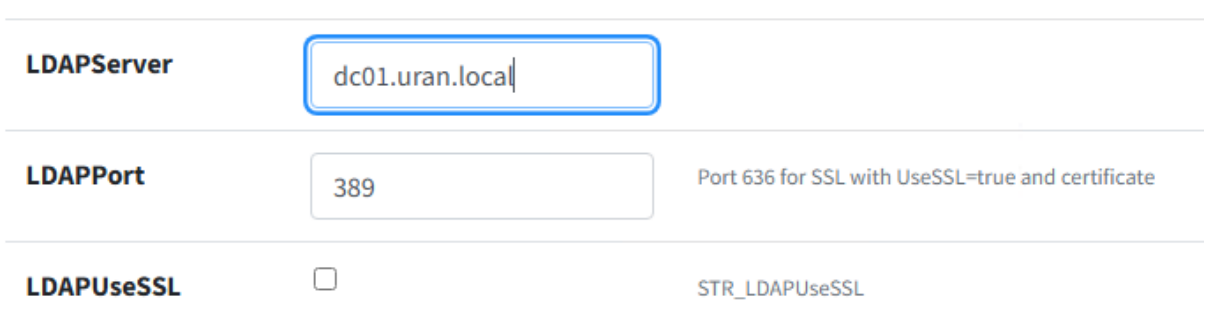
Configuration after installation

After installation, there are still a few things to configure. This can be done under "Global Configuration". You can switch between different languages in the ZeroPortal.

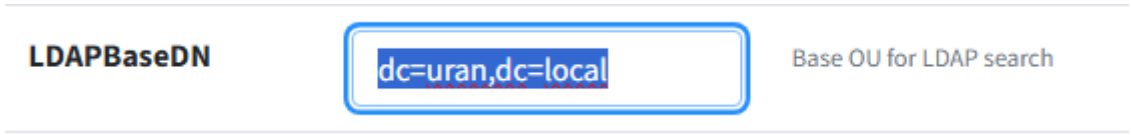


The shares under which packages are stored are specified under "Repositories". We have the option to search these paths later. For example, if you have \\SRV02\AppVShare$, this will be entered there. It is best to test whether the share works.

Under "LDAPServer" the login server. This can also be made highly available via NLB. For example, via a Netscaler. This includes the port and whether it should communicate via LDAPs.

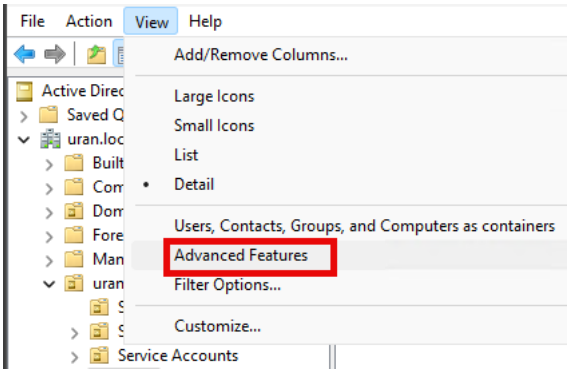


The LDAPBaseDN defines from which point (LDAP string) the ZeroPorttral searches your domain for user accounts and groups.

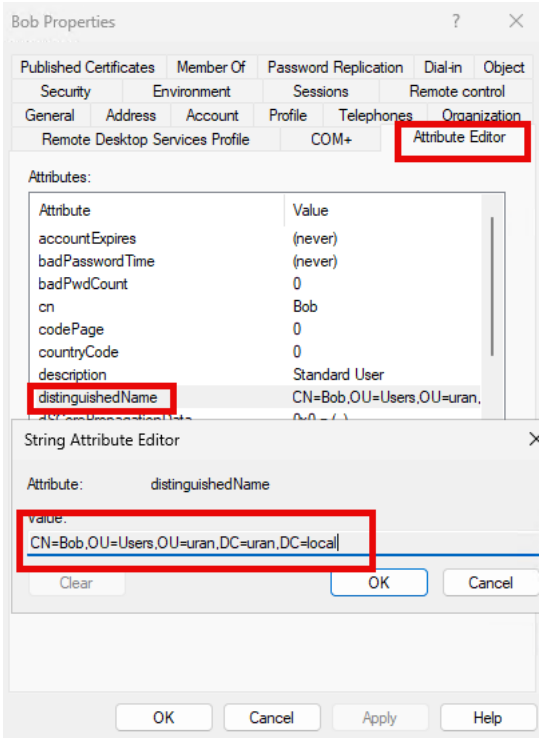


Now very important, ZeroPortal currently uses a proxy Unser to search the AD. This is unfortunately somewhat insecure, as the password is also stored in the DB. The user should be as restricted as possible. We will change this later so that either the computer account or a service user takes over the search.

To do this, the LDAP string of the user must be specified. This can be read in the user object when the extended functions of Active Directory users and computers are active.



And read out in the attributes:



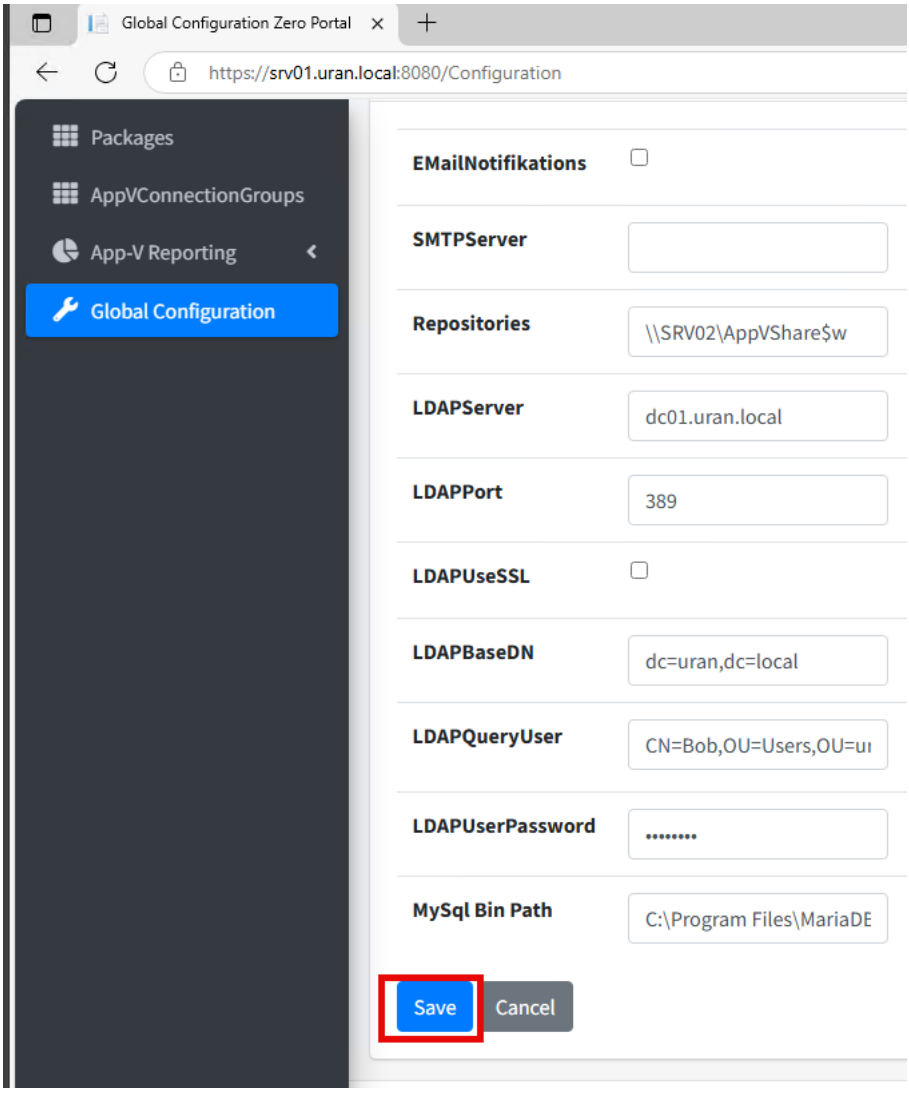
Then enter Bob's password:

Finally, the bin path of Mysql or Maria DB:

The version used in this document is:

C:\Program Files\MariaDB 11.8\bin

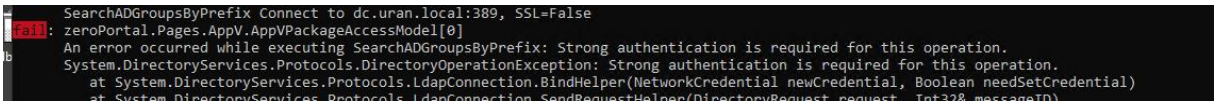
Finally save:

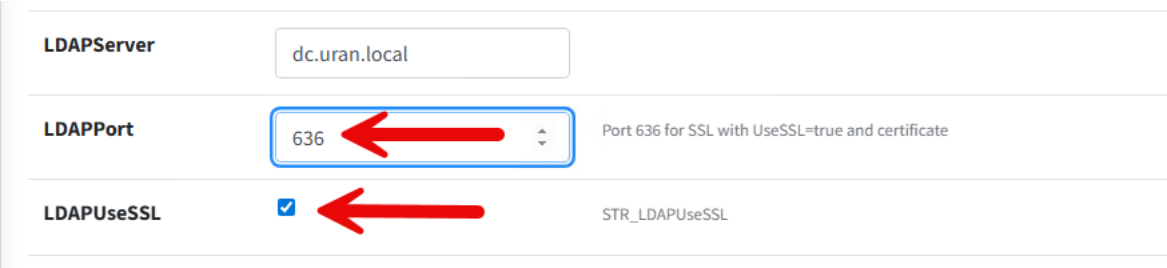


ATTENTION: DC on Server 2025

From Windows Server 2025 LDAPS has become mandatory. Make sure you have a server certificate on the DC with the appropriate subject. In this case, the ZeroPortal must be converted to LDAPS.

Possible message in the log with "Strong Authentication":





ATTENTION:

The certificate on the DC must use a CN that corresponds to the FQDN (here "dc.uran.local"). In later versions, "alternative names" and wildcard certificates should also be taken into account.

Creating the packet SMB share

The share for packages can be located on any server. Folders may be created in the share. A share for "Everyone" is sufficient for a test environment.

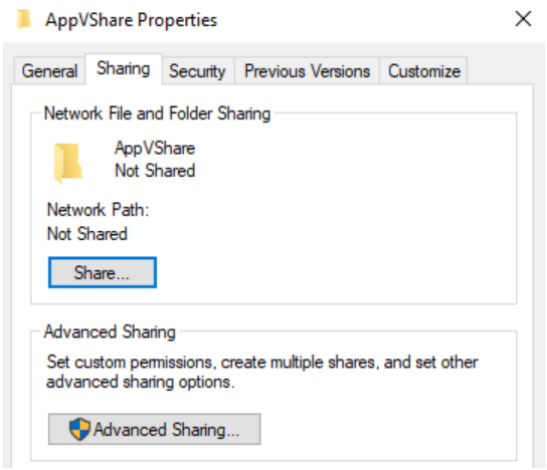
Create a new folder locally or on a file server, e.g.
D:\AppVShare
or
C:\AppVContent

Set NTFS permissions

- Open the folder properties > **Security** tab.
- **Recommended permissions:**
    - **Read** for:
        - The computer or user accounts that should read App-V packages i.e. domain computers, and domain users.
    - **Change** for:
        - Admins who are to upload/modify packages

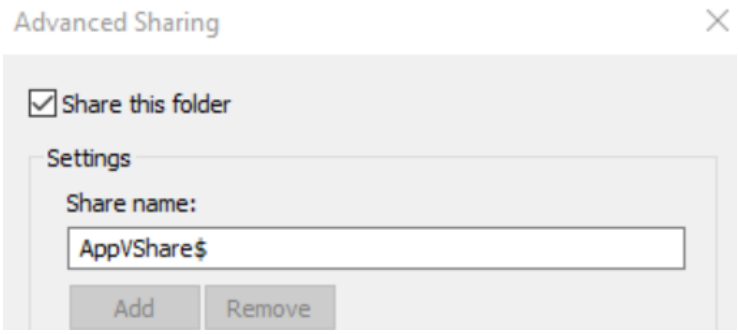
Set up sharing

- Right-click on the folder > **Properties**
- Or: In the **Share** tab> **Advanced Sharing**



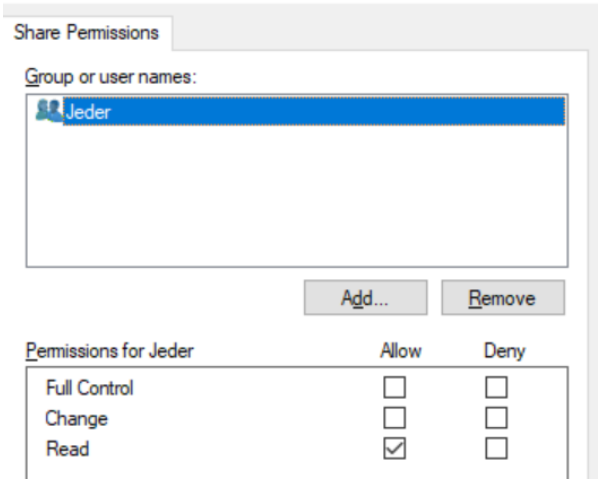
Share name for the package share

e.g: AppVShare$
=> "$" to hide the share.

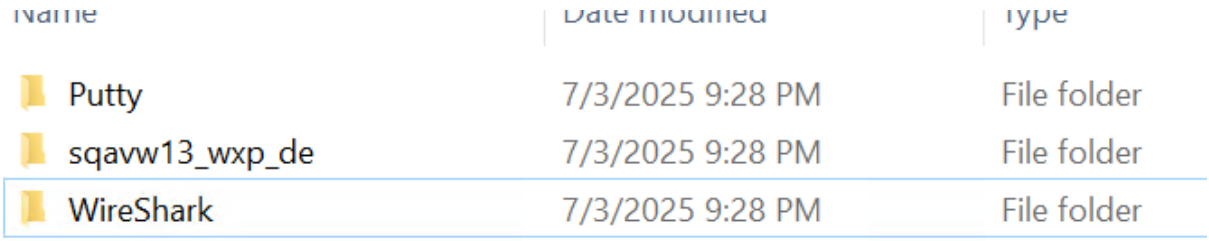


- **Permissions:**
    - Standard: Everyone = Read

In a German domain, "Everyone" = "Jeder" (everyone)

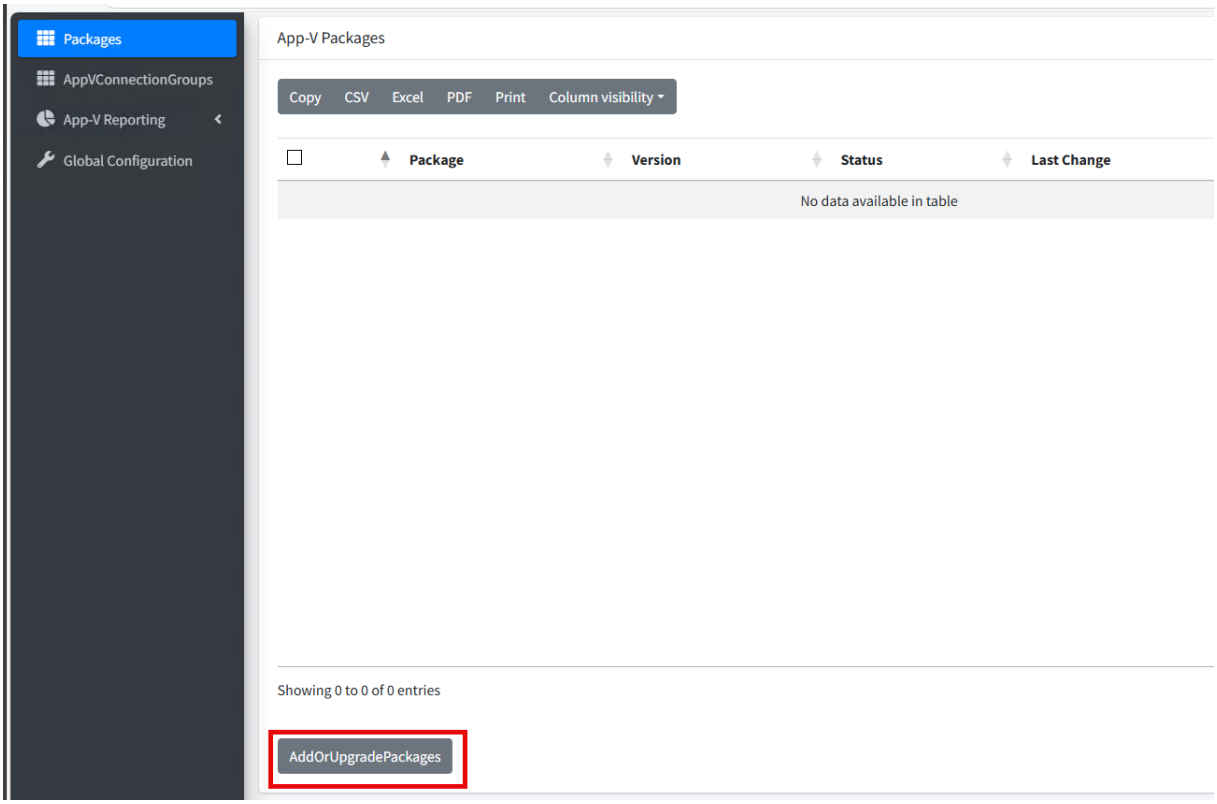


Place your packages in the folder. ZeroPortal supports further shares.

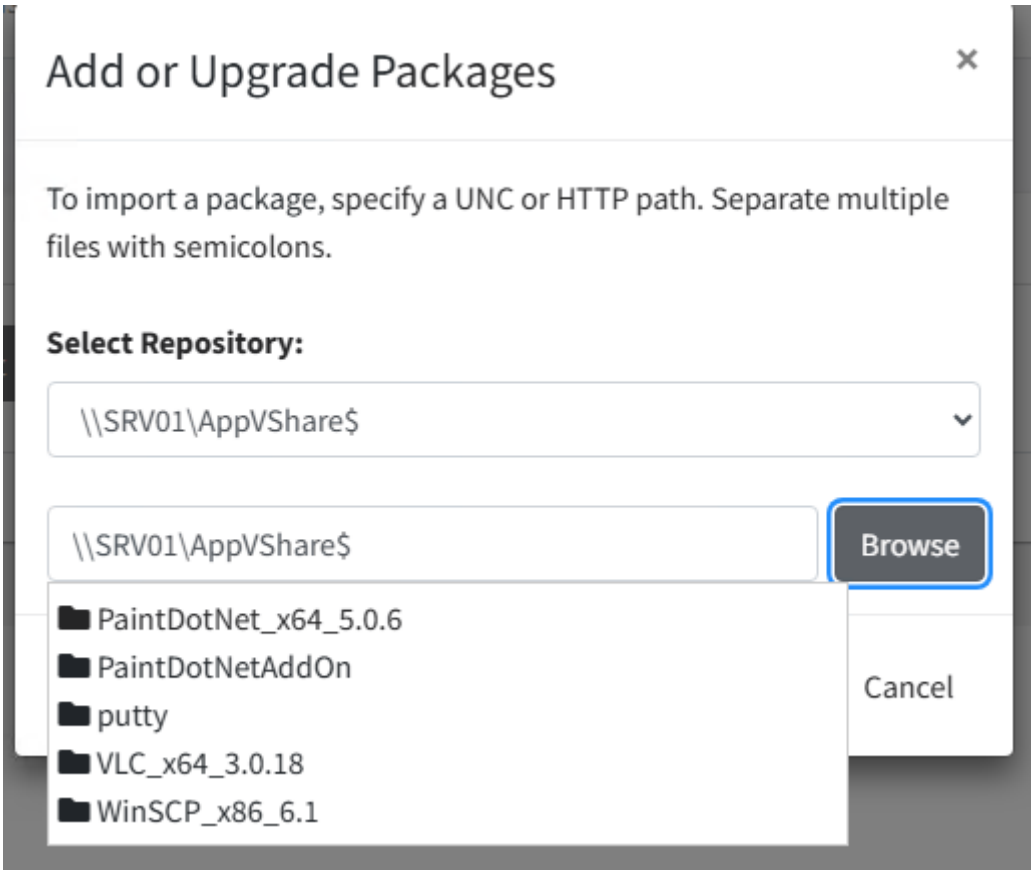


Administration Basics

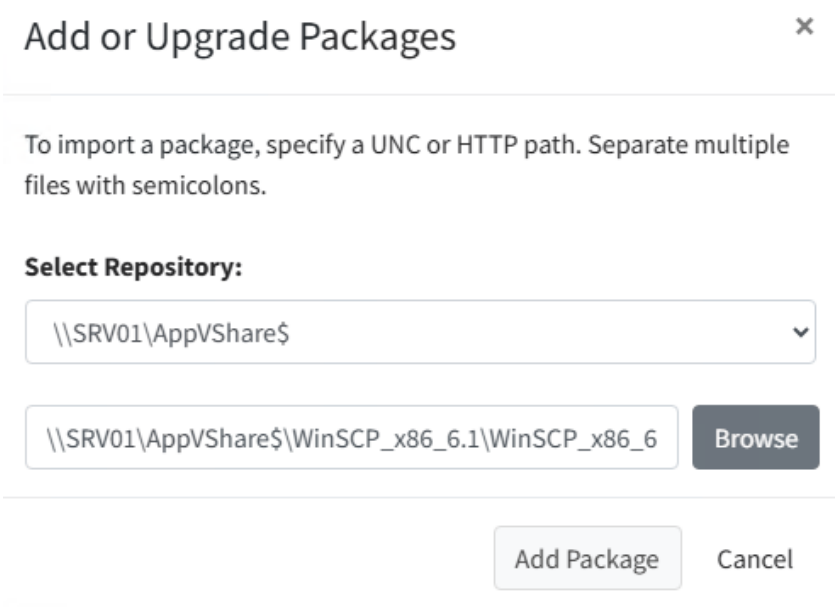
For example, for testing, you can add a package under Packages with "AddOrUpgradePackage".

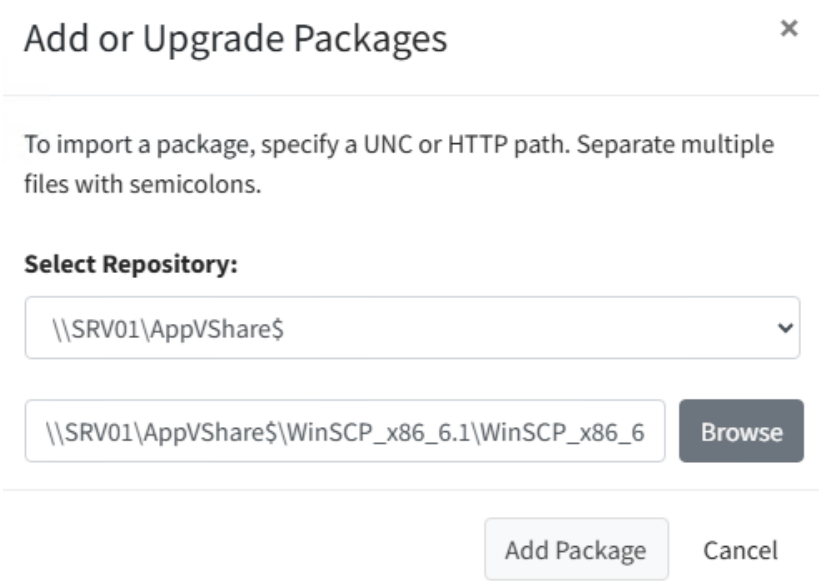


We can now browse the repository for the package.



And add it with "Add Package"





If something does not work, it is worth looking in the logs under "C:\Windows\Temp\ZeroPortalLogs":

```
fail: Microsoft.AspNetCore.Diagnostics.ExceptionHandlerMiddleware[1]
      An unhandled exception has occurred while executing the request.
      System.ApplicationException: An internal server error has occurred. Please contact the system administrator.
       ---> System.DirectoryServices.Protocols.LdapException: The LDAP server is unavailable.
          at System.DirectoryServices.Protocols.LdapConnection.Connect()
          at System.DirectoryServices.Protocols.LdapConnection.SendRequestHelper(DirectoryRequest request, Int32& m
```

Zero Portal client configuration

Like the Microsoft Publishing Server, the ZeroPortal server is configured either via Group Policy or PowerShell.

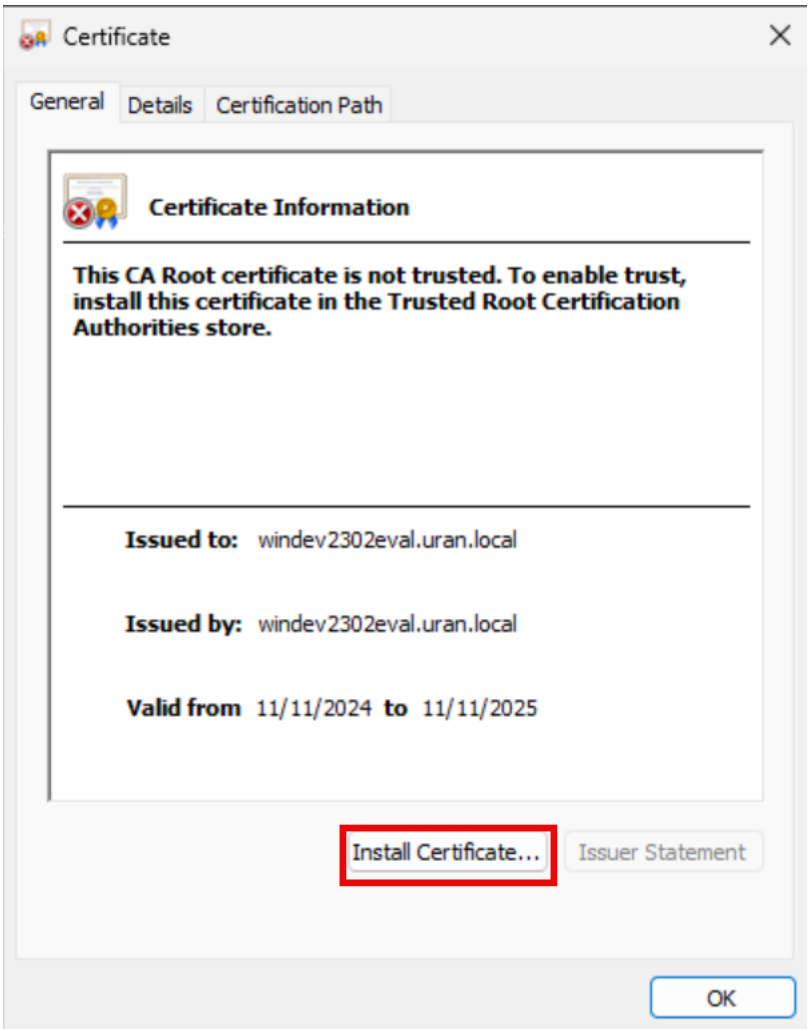
ATTENTION: In contrast to the Publishing Server, the port for publishing, reporting and management always remains the same! Only a subordinate page is referred to.

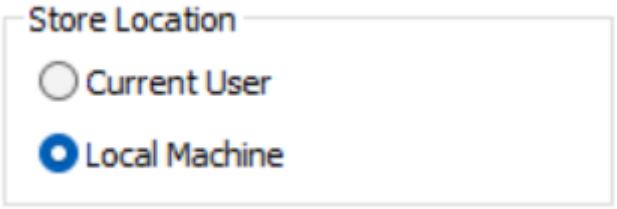
Furthermore: Please always use an FQDN with server name and complete domain suffix! This is required for Kerberos authentication and certificate management.

Install certificate on the client

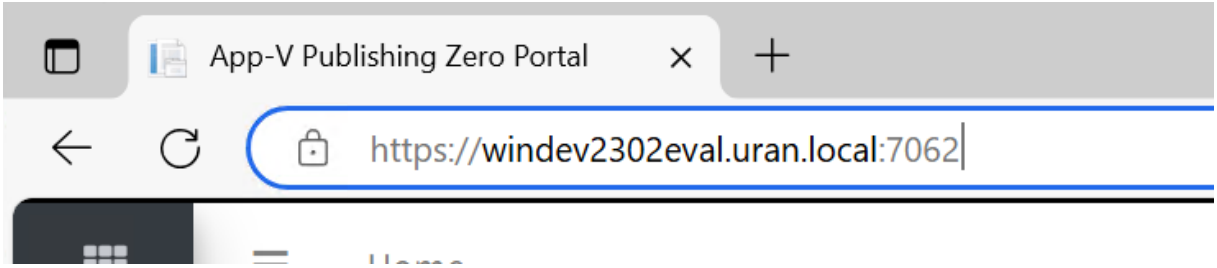
Encrypted access to the ZeroPortal is not mandatory. However, we strongly recommend it for security reasons!

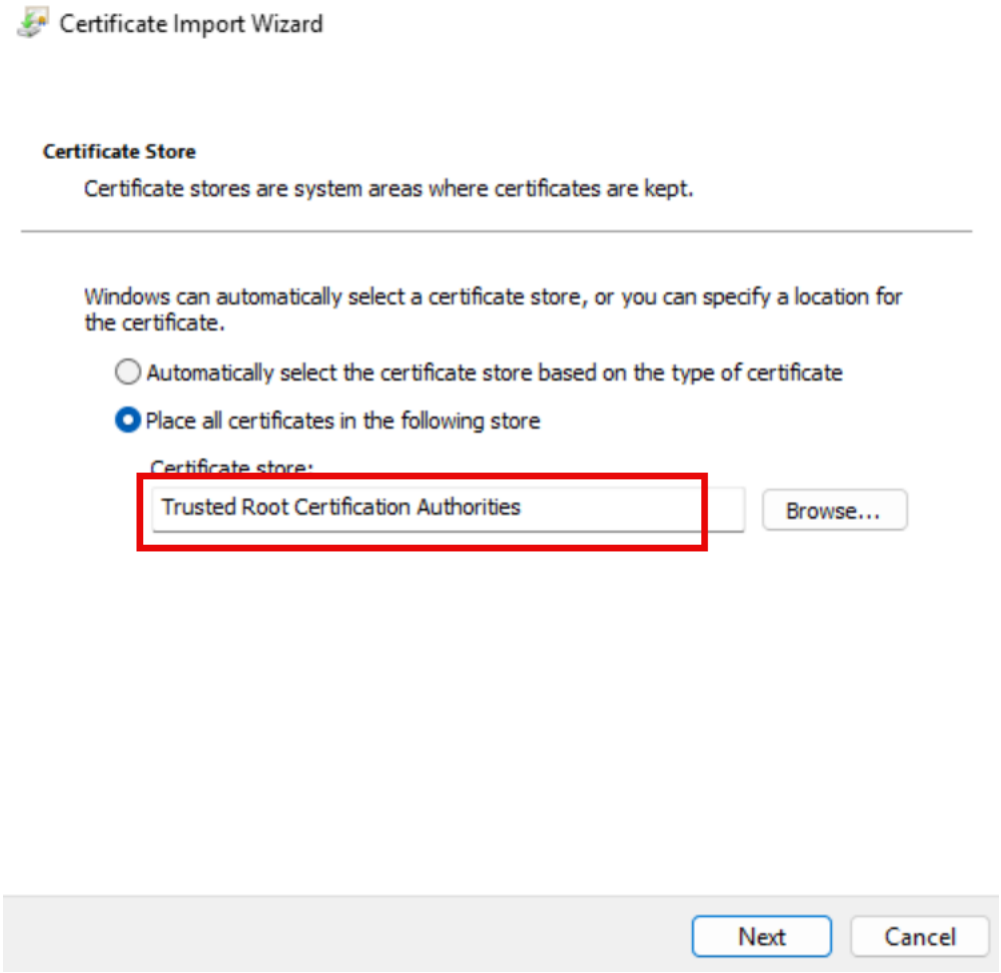
For encrypted access to the ZeroPortal, we need a root certificate of the CA from which the server certificate originates or, in the case of a self-signed certificate, a ".cer" file (without private key). The configuration tool for the ZeroPortal generates such a file when a self-signed certificate is created. Distribute this on the end device via a GPO or install it by double-clicking in the trusted root certification authorities of the computer.





Test in the browser. Use your own URL and port:



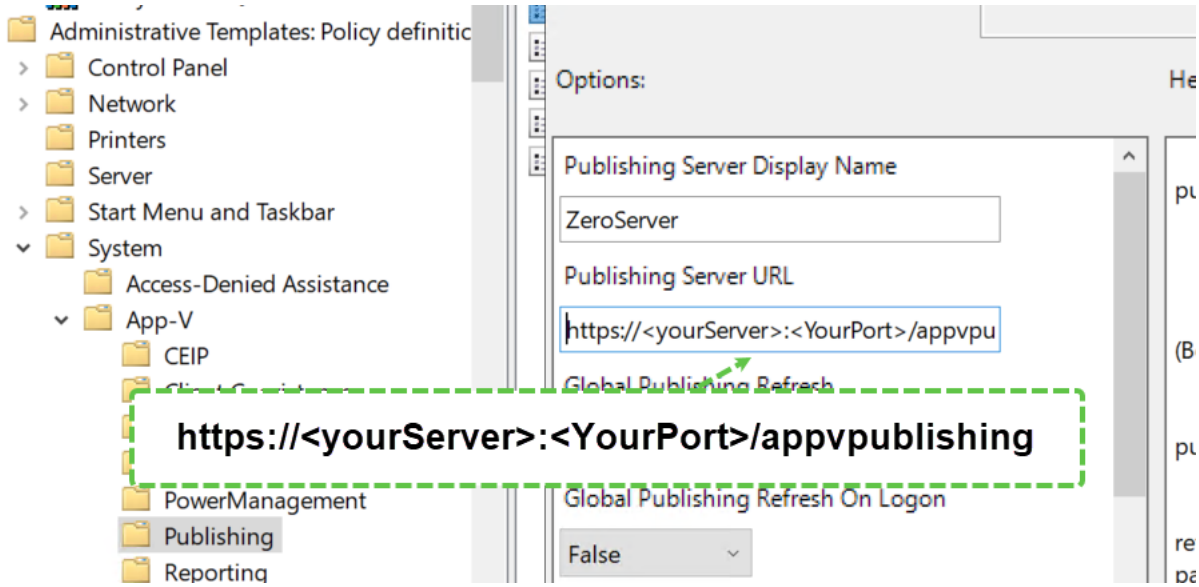


Receiving App-V packages

For App-V publishing, the ending "/appvpublishing" is added to the server address (with port).

https://<yourServer>:<YourPort>/appvpublishing

For the App-V group policies, this looks like the following screenshot




```
PS C:\> Get-AppvPublishingServer


Id                          : 1
SetByGroupPolicy            : False
Name                        : AppV2025
URL                         : https://windev2302eval.uran.local:7062/appvpublishing
GlobalRefreshEnabled        : False
GlobalRefreshOnLogon        : False
GlobalRefreshInterval       : 0
GlobalRefreshIntervalUnit   : Day
UserRefreshEnabled          : True
UserRefreshOnLogon          : True
UserRefreshInterval         : 0
UserRefreshIntervalUnit     : Day
```

Example with PowerShell:

```
PS C:\windows\system32> Enable-Appv
App-V was successfully enabled.
PS C:\windows\system32> Add-AppvPublishingServer -Name ZeroPortalTest -URL https://windev2302eval.uran.local:7062/appvpublishing


Id                          : 1
SetByGroupPolicy            : False
Name                        : ZeroPortalTest
URL                         : https://windev2302eval.uran.local:7062/appvpublishing
GlobalRefreshEnabled        : False
GlobalRefreshOnLogon        : False
GlobalRefreshInterval       : 0
GlobalRefreshIntervalUnit   : Day
UserRefreshEnabled          : True
UserRefreshOnLogon          : True
UserRefreshInterval         : 0
UserRefreshIntervalUnit     : Day
```

Synchronize manually with PowerShell

Get-AppvPublishingServer | Sync-AppvPublishingServer

Query whether it has worked:

```
PS C:\windows\system32> Get-AppvClientPackage


PackageId             : baad19ad-aa06-48ef-b213-3822c295e4fc
VersionId             : 65a69d01-6268-4d6d-922f-53f987d18298
Name                  : mRemoteNG_x86_1.76.20
```

Note: There is no delay when a package is published in the ZeroPortal. It can be synchronized immediately.

Reporting function with ZeroPortal

The App-V Reporting is also compatible with the Microsoft App-V Client CmdLets.

The extension "/AppVReportReceiver" is used here.

Url for the App-V Reporting:

https://<yourServer>:<YourPort>/AppVReportReceiver

The following is an example from an App-V client configuration (Get-AppvClientConfiguration):

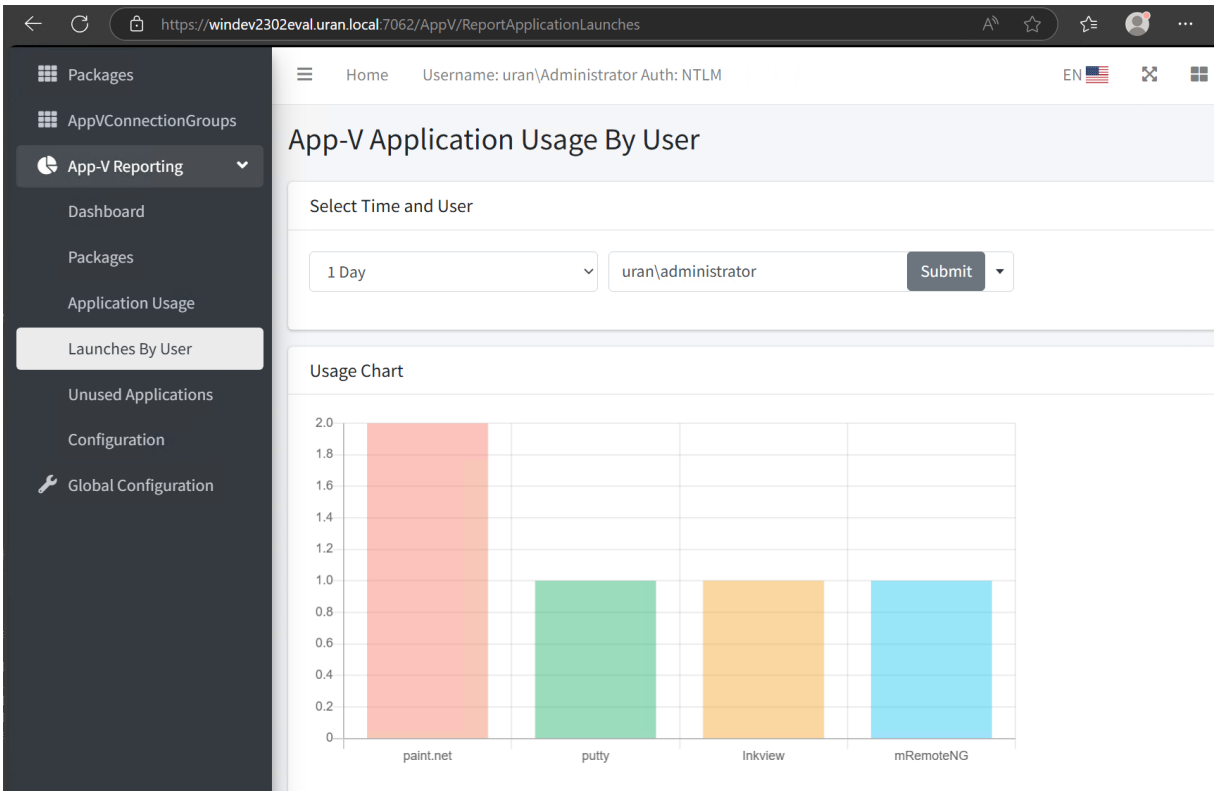
```
ReportingEnabled                1
ReportingStartTime
ReportingRandomDelay
ReportingInterval
ReportingServerURL              http://192.168.1.102:8080/AppVReportReceiver
ReportingDataCacheLimit
ReportingDataBlockSize
```

Similarly, such a URL can also be used in the group policies.

Here is an example of the configuration. The synchronization interval can be configured or forced with "Send-AppVClientReport".

```
PS C:\windows\system32> Set-AppvClientConfiguration -ReportingServerURL https://windev2302eval.uran.local:7062/AppVReportReceiver

Name              Value                                                SetByGroupPolicy
----              -----                                                ----------------
ReportingServerURL https://windev2302eval.uran.local:7062/AppVReportReceiver           False


PS C:\windows\system32> Set-AppvClientConfiguration -ReportingEnabled $true

Name             Value SetByGroupPolicy
----             ----- ----------------
ReportingEnabled     1            False


PS C:\windows\system32> Send-AppvClientReport
The Application Virtualization Client Report was sent successfully.
PS C:\windows\system32>
```

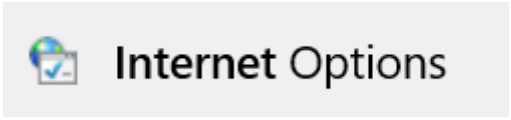
The result can look like this!

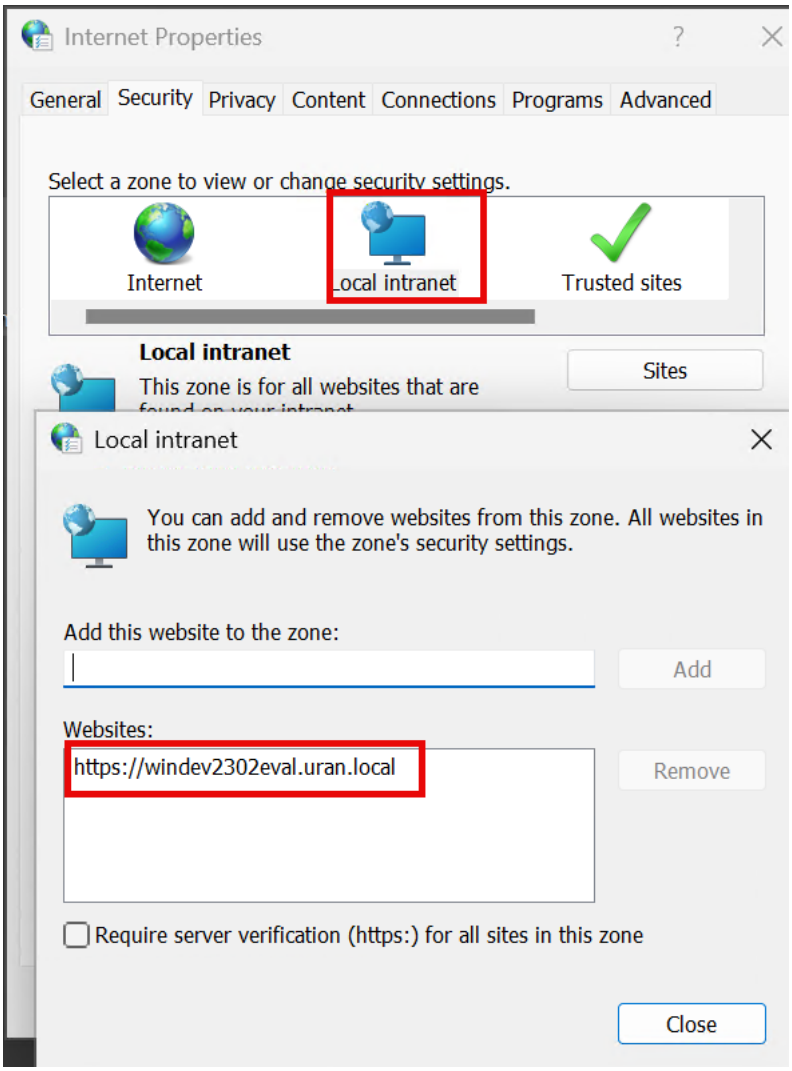


Necessary settings for Kerberos

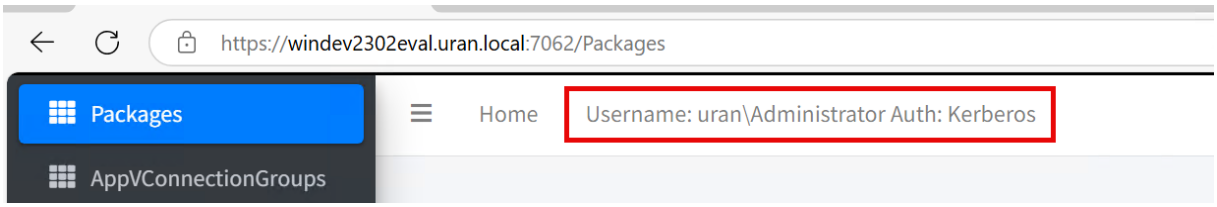
The App-V client authenticates itself with Kerberos on the ZeroPortal. Here are some requirements to fulfill. The url of the ZeroPortal server must be in the Trusted Sides.

This works via the "Internet Options" (in the start menu) or via a group policy:

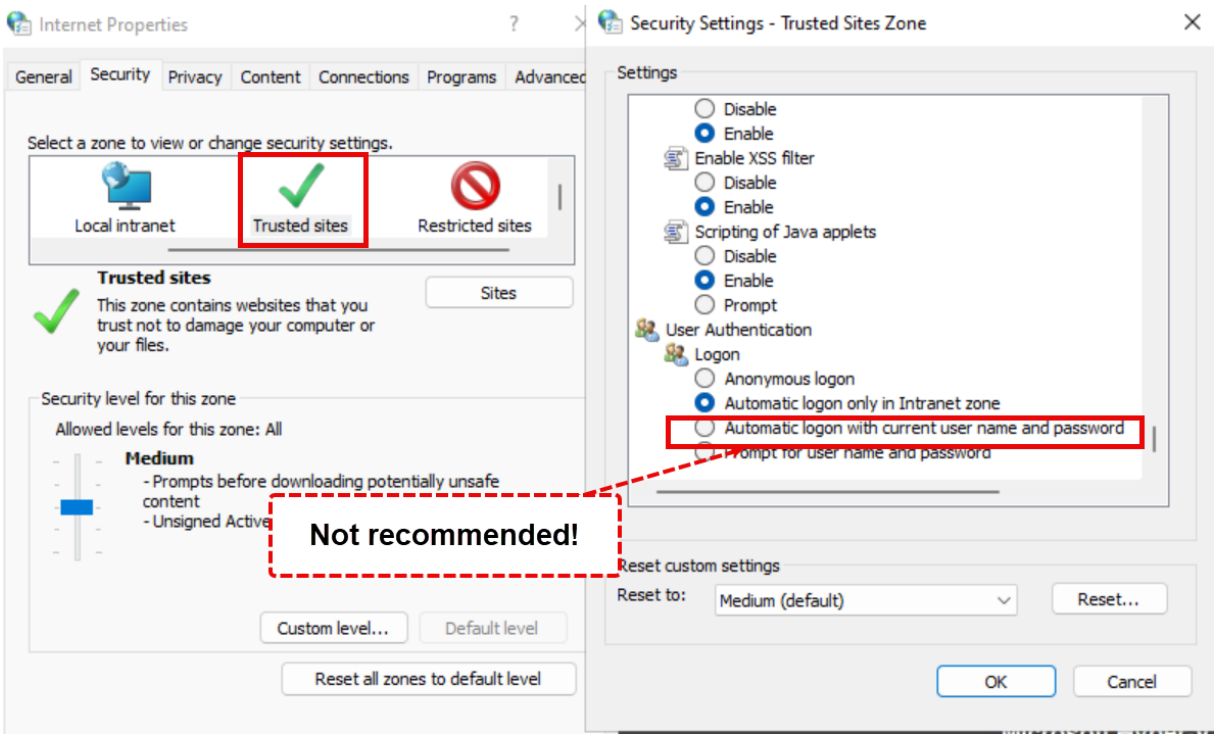




Note: For this to work the same way, the user / administrator may have to log in once again so that a new Kerbero ticket is issued.



Please always use an FQDN. The settings in the "Trusted Sites" should be sufficient. In some cases, at least with App-V publishing, it was necessary to tweak the security a little. We would recommend the following and is not necessary for our environments.



ZeroPortal PowerShell Module (Alpha)

The module is currently in a very early phase and still needs a lot of work!

Import module

Import-Module 'C:\Program Files\ZeroPortal\PoshModule\ZeroPortal.psd1' #Optional -Force

```
PS C:\> import-Module 'C:\Program Files\ZeroPortal\PoshModule\ZeroPortal.psd1' -Force
BaseUri set: https://appv01.uran.local:8080/api/AppVPackaging
Ping to appv01.uran.local successful.
HTTPS connection to https://appv01.uran.local:8080 successful (Status: 200).
PS C:\> get-command -Module ZeroPortal

CommandType     Name                                               Version    Source
-----------     ----                                               -------    ------
Function        Get-AppvZeroPortalCmdLetConfiguration              0.2        ZeroPortal
Function        Get-AppvZeroPortalPackage                          0.2        ZeroPortal
Function        Get-OtherErrors                                    0.2        ZeroPortal
Function        Import-AppvZeroPortalPackage                       0.2        ZeroPortal
Function        Remove-AppvZeroPortalPackage                       0.2        ZeroPortal
Function        Set-AppvZeroPortalCmdLetConfiguration              0.2        ZeroPortal
```

The CmdLets are still limited but it is enough to display and import App-V applications on the server.

Show all server packages

Get-AppvZeroPortalPackage *

```
PS C:\> Get-AppvZeroPortalPackage * | Select-Object -Property name

Name
----
sqavw13_wxp_de
WireShark
WinSCP_x86_6.3.4


PS C:\> _
```

Import packages from a share

```
 Get-ChildItem \\appv01.uran.local\appvshare$\*.appv -Recurse |
ForEach-Object { Import-AppvZeroPortalPackage -PackagePath $_ }
```

```
PS C:\> Get-ChildItem \\appv01.uran.local\appvshare$\*.appv -Recurse |  ForEach-Object { Import-AppvZeroPortalPackage -
ackagePath $_ }


Message       : Package imported successfully.
PackageGuid   : 00b87000-1edc-46a6-93ea-f3a5af851ef1
VersionGuid   : 440b145d-ae46-4881-a5a3-0c115b80a783
Name          : sqavw13_wxp_de
VersionNumber : 0.0.0.1
```

Delete packages

Remove-AppvZeroPortalPackage

```
PS C:\> Get-AppvZeroPortalPackage * | Remove-AppvZeroPortalPackage -Confirm:$false

PackageGuid                          VersionGuid                          Message
-----------                          -----------                          -------
00b87000-1edc-46a6-93ea-f3a5af851ef1 440b145d-ae46-4881-a5a3-0c115b80a783 Package deleted successfully.
dabec7f4-2eae-4088-b99d-1547b749f19e c1414304-bacd-4398-b2db-a59daec28755 Package deleted successfully.
857639ef-ecc9-4224-9441-90fffa376a4f fd4e2873-1d07-416f-b932-76dd0b059e72 Package deleted successfully.
```

Appendix

Troubleshooting

Logs

The logs under "C:\Windows\Temp\ZeroPortalLogs" contain a lot of information. You can also start the ZeroPortal in the command line.

```
C:\Users\Administrator.uran>cd "c:\Program Files\ZeroPortal"

c:\Program Files\ZeroPortal>zeroPortal.exe
DB version OK: 11.8.2 = 10.4.3
Debug: Server=Localhost;port=3306;User ID=root;Password=mypass;Database=Zero.Alpha.neu
info: Microsoft.Hosting.Lifetime[14]
      Now listening on: https://[::]:8443
info: Microsoft.Hosting.Lifetime[0]
      Application started. Press Ctrl+C to shut down.
info: Microsoft.Hosting.Lifetime[0]
      Hosting environment: Production
info: Microsoft.Hosting.Lifetime[0]
      Content root path: c:\Program Files\ZeroPortal
info: zeroPortal.Pages.AppV.AppVPackageAccessModel[0]
      AppVPackageAccess:AccountName: uran\dom
info: zeroPortal.Pages.AppV.AppVPackageAccessModel[0]
```

Here, for example, is an error where an incorrect password was entered for the LDAP user:

```
      SearchADGroupsByPrefix Connect to dc.uran.local:636, SSL=True
fail: zeroPortal.Pages.AppV.AppVPackageAccessModel[0]
      An error occurred while executing SearchADGroupsByPrefix: The supplied credential is invalid.
      System.DirectoryServices.Protocols.LdapException: The supplied credential is invalid.
         at System.DirectoryServices.Protocols.LdapConnection.BindHelper(NetworkCredential newCredential, Boolean needSetCredential)
```

Authentication problems with Server 2025

With DC Server 2025, everything must be switched to encryption. Unencrypted LDAP is no longer possible! LDAPS is also recommended for older domain controllers!