Installation Guide: vSolution Link Pro on IIS
Version 1.9.0
vSolution Link Pro
Installation Guide on IIS

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1. About this Guide
This document explains the setup of vSolution Link Pro application by WolfVision on a Windows IIS server.

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2023-07-27
3. System Requirements

Windows Web Services (IIS Internet Information Server)

As vSolution Link Pro is a web server application, it can be accessed by any modern fully HTML5 compatible browser of a third-party device in the local network.

To use all features the application provides, it has to be installed as IIS (Internet Information Server). Email credentials, SSL certificate, Internet access and 24/7 server availability are also required.

The software (64bit application) can be installed on following operating systems. The following shows the minimum system requirements, more recommended:

- **Windows Server 2019 or newer**
  (all requirements according to Microsoft must be fulfilled)
- **CPU minimum 1 Core with 2.60GHz (2 cores, or more recommended)**
- **4GB RAM (8GB, or more recommended)**
- **100GB minimum free disk space for firmware files (250GB, or more recommended)**
- **Access to secure port (e.g. 443, https default)**
- **Server address (IP:port) has to be reachable via secure web socket (wss)**
- **.NET Core Hosting Bundle, tested with version 7.0.3**

**Please note**

Latest updates recommended.

Earlier versions of operating systems are not tested and may not be supported.

Please note the required disk space for the local firmware repository, disk space of at least 20GB is recommended.

To access the devices, they have to be online and in the same network to be reachable! Pay attention of correct network settings, especially when running in special network environments.

Cynap systems will disable their LAN ports when powering down by default and can be powered up by using the Wake on LAN functionality. For network infrastructures with blocked Wake on LAN, use power down mode Power Save to keep the LAN port of your Cynap active.

When using WolfVision Visualizer devices, use power down modes Normal or ECO to keep the LAN port active. Certain Visualizer models are supporting Wake on LAN (check power down mode of connected Visualizer).

An incorrect system time may cause network connection to fail, the use of a valid timeserver recommended.

### 3.1. Custom Email-Provider

Valid custom email-provider credentials are required when enabling:

- 2-factor authentication
- Management Hub
- Event log Email notification
- Box Replacement`
- Password reset`

` If no custom provider is set, the integrated Sendgrid account will be used for sending Emails.

### 3.2. SSL certificate – prerequisite for enabling Management Hub

A valid SSL certificate is required when restricting the access to https.
3.3. Firewall Rules

Ensure that all necessary ports, services and IP addresses are available and not blocked by your firewall (external and personal).

Acknowledgements ("ACKs") of TCP packets are not considered in the following table in order to be able to illustrate the direction of the data packets. Since acknowledgements are usually sent back via the same TCP port, the other direction shall not be blocked to ensure smooth functioning.

On certain systems, you have to set a rule to allow the application: **WolfVision.MgmtTool.Api.exe** for full functionality.

<table>
<thead>
<tr>
<th>Function / Application</th>
<th>Port</th>
<th>Type</th>
<th>Inbound / Outbound</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vSolution Link Pro</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wake On LAN</td>
<td>7 / 9</td>
<td>UDP</td>
<td>Inbound / Outbound</td>
<td>Wake On LAN – Usually port 7 is used for sending the magic packet</td>
</tr>
<tr>
<td>DNS</td>
<td>53</td>
<td>TCP / UDP</td>
<td>Inbound / Outbound</td>
<td>DNS – This port will be used for Domain Name System. If this port is blocked, DNS service are not available</td>
</tr>
<tr>
<td>http, Cynap control</td>
<td>80</td>
<td>TCP</td>
<td>Inbound / Outbound</td>
<td>This is the default port to connect to the web interface (httpd) of vSolution Link Pro. Of this port is blocked, connection cannot be established</td>
</tr>
<tr>
<td>https, SSL, e.g. Cloud Service, Cynap control</td>
<td>443</td>
<td>TCP</td>
<td>Inbound / Outbound</td>
<td>This is the default port to connect to web interface (https) of vSolution Link Pro. If this port is blocked, connection cannot be established.</td>
</tr>
<tr>
<td>SMTP</td>
<td>587</td>
<td>SMTP</td>
<td>Outbound</td>
<td>Mail Server – Port for communication with SMTP server.</td>
</tr>
<tr>
<td>Discovery Multicast</td>
<td>50000</td>
<td>UDP</td>
<td>Inbound</td>
<td>This port is used for device discovery all available Cynap and Visualizer in the network by vSolution applications (uses Multicast IP address 239.255.255.250). If this port is blocked, device discovery is not possible</td>
</tr>
<tr>
<td>Device Discovery</td>
<td>50913</td>
<td>UDP</td>
<td>Inbound</td>
<td>This port is used for device discovery. If this port is blocked, device discovery is not possible</td>
</tr>
<tr>
<td>For control purposes</td>
<td>50915</td>
<td>TCP</td>
<td>Inbound / Outbound</td>
<td>This port is used for control purposes. If this port is blocked, no control is possible</td>
</tr>
</tbody>
</table>
4. On-Premise or Management Hub

The vSolution Link Pro is a web server application and needs to be installed, preferred on a server to ensure 24/7 availability.

4.1. Hosted On-Premise (Local Installation)

When the application is hosted on-premise, this server, all Cynap and Visualizer systems and also the third party devices (desktops, workstations, tablets) have to be in the same Ethernet network.

4.2. Hosted with Management Hub (Cloud Installation)

When the application is hosted with enabled Management Hub feature, Cloud supported devices can be managed additionally.

Supported WolfVision Cynap systems in Management Hub:

- Cynap
- Cynap Pro
- Cynap Core
- Cynap Core Pro
- Cynap Pure
- Cynap Pure Pro
- Cynap Pure Receiver
- Cynap Pure SDM

For full compatibility, keep installed firmware version of all your devices up to date.
5. **Server Installation (Windows IIS)**

The vSolution Link Pro is a web server application and needs to be installed, preferred on a server to ensure 24/7 availability. Different versions of IIS may vary slightly, the following steps are describing the installation on a Windows Server 2019 Datacenter (OS build 17763.1131) with .NET Core Hosting Bundle version 7.0.3. The installation on other versions may vary. vSolution Link Pro is delivered with a standard web.config, which can be adopted, depending on your needs. Note additional settings for using Management Hub (cloud access) feature.

**5.1. Download the installation files**

Download the zip archive vSolutionLinkPro_WindowsServer.zip from the WolfVision web page and unpack it.

**5.2. Add IIS functionality**

Open the Server Manager Dashboard and Add Roles and Features:

![Server Manager Dashboard](image)

*Important*

WebDAV role should stay disabled for vSolution Link Pro server for full functionality.
Before you begin

This wizard helps you install roles, role services, or features. You determine which roles, role services, or features to install based on the computing needs of your organization, such as sharing documents, or hosting a website.

To remove roles, role services, or features:
Start the Remove Roles and Features Wizard

Before you continue, verify that the following tasks have been completed:

- The Administrator account has a strong password
- Network settings, such as static IP addresses, are configured
- The most current security updates from Windows Update are installed

If you must verify that any of the preceding prerequisites have been completed, close the wizard, complete the steps, and then run the wizard again.

To continue, click Next.

Select installation type

Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHID).

- Role-based or feature-based installation
  Configure a single server by adding roles, role services, and features.

- Remote Desktop Services installation
  Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.
Select destination server

Select a server or a virtual hard disk on which to install roles and features.

- Select a server from the server pool
- Select a virtual hard disk

Server Pool

Filter: 

<table>
<thead>
<tr>
<th>Name</th>
<th>IP Address</th>
<th>Operating System</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.wolfvision.intra</td>
<td>10.10.20.43</td>
<td>Microsoft Windows Server 2019 Datacenter</td>
</tr>
</tbody>
</table>

1 Computer(s) found

This page shows servers that are running Windows Server 2012 or a newer release of Windows Server, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

Select server roles

Select one or more roles to install on the selected server.

- Web Server (IIS)

Description: Web Server (IIS) provides a reliable, manageable, and scalable Web application infrastructure.
Add features that are required for Web Server (IIS)?

The following tools are required to manage this feature, but do not have to be installed on the same server.

- Web Server (IIS)
  - Management Tools
    - [Tools] IIS Management Console

- Include management tools (if applicable)

Add Features  Cancel

Select server roles

Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results

Select one or more roles to install on the selected server.

- Active Directory Domain Services
- Active Directory Federation Services
- Active Directory Lightweight Directory Services
- Active Directory Rights Management Services
- Device Health Attestation
- DHCP Server
- DNS Server
- Fax Server
- File and Storage Services (1 of 12 installed)
- Host Guardian Service
- Hyper-V
- Network Controller
- Network Policy and Access Services
- Print and Document Services
- Remote Access
- Remote Desktop Services
- Volume Activation Services

Web Server (IIS)

Windows Deployment Services
Windows Server Update Services
NET Framework 3.5 combines the power of the .NET Framework 2.0 APIs with new technologies for building applications that offer appealing user interfaces, protect your customers’ personal identity information, enable seamless and secure communication, and provide the ability to model a range of business processes.

Web servers are computers that let you share information over the Internet, or through intranets and extranets. The Web Server role includes Internet Information Services (IIS) 10.0 with enhanced security, diagnostic and administration, a unified Web platform that integrates IIS 10.0, ASP.NET, and Windows Communication Foundation.

- The default installation for the Web Server (IIS) role includes the installation of role services that enable you to serve static content, make minor customizations (such as default documents and HTTP errors), monitor and log server activity, and configure static content compression.
5.4. Select WebSocket Protocol (Application Development, sub item of IIS Web Server)

![Select role services](image1)

![Confirm installation selections](image2)
5.5. Prepare file structure

Copy the unzipped folder vSolutionLinkPro_WindowsServer to c:\inetpub\wwwroot

Change properties to manage permissions of the IIS to allow full control
5.6. Start Internet Information Services (IIS) Manager
5.7. Setup IIS

Manage sites of IIS and add the physical path.

Restrict access to https and check the used port.
This setting is required prior activating Management Hub feature.
Define your valid SSL certificate for proper https connection. This setting is required prior activating Management Hub feature.

Change .NET CLR version in Basic Settings to "No Managed Code"
Change Managed pipeline mode to "Integrated".
Change Start Mode in Advanced settings to "AlwaysRunning" to allow 24/7 operation.

Change Idle Time-out (minutes) in Advanced settings to "0".

Please note:
When the IIS is running OnDemand, it stops when:

- No vSolution Link Pro window is open in a browser window at any client
- No Management Hub connection is open
- No device uses calling home.
6. Installing .NET Core Windows Server Hosting

Install the .NET Core Hosting Bundle.
The application was tested with .NET version 7.0.3:

For further details about IIS, please visit:
https://docs.microsoft.com/en-us/aspnet/core/host-and-deploy/iis/?view=aspnetcore-7.0

Stop and restart the service at Application Pool Tasks at IIS Manager.

6.1. Adopt appsettings.json

The file appsettings.json allows modifying all settings offline by using a common text editor.
The most important settings are accessible at the graphical user interface (Configuration - Settings).

Using Management Hub (Cloud)
"UseHttps" in section "Hosting" has to be set to "true".

![Screenshot of appsettings.json configuration]
6.2. Activate Management Hub (optional, depending on setup)

The Management Hub for Cloud support needs to be enabled in the setting at initial start:

Alternative, activate the Management Hub in the file appsettings.json and adopt all settings according your needs manually:

(example)
7. Start the application

To start vSolution Link Pro, open the browser of the workstation and enter the IP address of the server.
Example URL http://192.168.0.1:80

For security reasons, the default password has to be changed at first login.
Please note, after inactivity of 30 minutes, you will be logged out automatically.

7.1. Device Requirements

To access the devices, they have to be online and reachable!
Cloud-connected devices (Management Hub) are keeping a secure websocket connection (WSS) open to allow managing.
E.g. Cynap devices will disable their LAN ports when powering down by default and can be powered up by using the Wake on LAN functionality. For network infrastructures with blocked Wake on LAN, use power down mode Power Save to keep the LAN port of your Cynap system active.
Depending on network infrastructure and due to multiple network ports, IP routing has to be specified to route the network traffic.
When using WolfVision Visualizer devices, use power down modes Normal or ECO to keep the LAN port active.
7.2. First Login - Change Password ("admin" at initial start)

When you login the first time, the password must be set:

When the blank Windows server IIS page should be opened, check the used ports and restart the server.
8. Updating vSolution Link Pro

Stop vSolution Link Pro at IIS Manager.
Backup the `Data` folder from your current installation folder.
Unpack the zip archive of the new version and copy the full content to the installation folder.
Copy the content from your previously saved content of 'Data` to the current `Data` folder.

8.1. Important

When the installation folder "vSolutionLinkPro" was exchanged, the permission has to be renewed (see chapter 5.5 Prepare file structure).

8.1. Complete the update

Start the vSolution Link Pro at the IIS Manager.

8.2. Updating from version v1.8.0 (or earlier)

When vSolution Link Pro version 1.8.0, or earlier was installed previously, the application pool has to be modified.

Set Enable 32-Bit Applications to "False"
Change Start Mode in Advanced settings to “AlwaysRunning” to allow 24/7 operation

Change Idle Time-out (minutes) in Advanced settings to "0"

Please note
When the IIS is running OnDemand, it stops when:

- No vSolution Link Pro window is open in a browser window at any client
- No Management Hub connection is open
- No device uses calling home.
Check the settings files `web.config` and `appsettings.json`.
Verify `web.config` (will be found in the root folder of the IIS), `hostingmodel` has to

Set Enable 32-Bit Applications to "False"
Verify web.config (will be found in the root folder of the IIS), hostingmodel has to be set to "inprocess".

The setting "InProcessHostingModel" in the file appsettings.json is obsolete since vSolution Link Pro v1.9 and later. This setting is ignored and has no effect anymore.
9. Index

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.9.0</td>
<td>2023-07-25</td>
<td>Update to vSolution Link Pro version 1.9.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Added rules for updating the application.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The version numbering has been adapted to the versioning of the application.</td>
</tr>
<tr>
<td>1.5</td>
<td>2023-05-17</td>
<td>Added Management Hub activation</td>
</tr>
<tr>
<td>1.4</td>
<td>2023-04-25</td>
<td>Update to vSolution Link Pro version 1.8.0</td>
</tr>
<tr>
<td>1.3</td>
<td>2022-06-21</td>
<td>.NET Core Update to version 5.0.17</td>
</tr>
<tr>
<td>1.2</td>
<td>2022-05-23</td>
<td>Added WebDAV note</td>
</tr>
<tr>
<td>1.1</td>
<td>2021-07-07</td>
<td>Updated Firewall rules</td>
</tr>
<tr>
<td>1.0</td>
<td>2021-03-09</td>
<td>Created</td>
</tr>
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</table>