

Password Manager

Release Notes

Version 5.14.3

12 November 2024, 15:51

These release notes provide information about the Password Manager 5.14.3 release. For the most recent documents and product information, see [Password Manager Technical Documents](#) on the One Identity Support Portal.

About this release

Password Manager 5.14.3 is a patch release with no new functionality.

- For the list of resolved issues, see [Resolved issues](#).
- For the list of known issues, see [Known issues](#).

Resolved issues

The following is a list of issues addressed in Password Manager 5.14.3.

Table 1: Resolved issues – General Password Manager issues

Resolved issue	Issue ID
Fixed certain use cases when using IPv6 could cause connection issues to LDAP systems.	470049
Fixed the Authenticate with Password activity so that it now selects the domain controllers to communicate with based on the domain connection settings.	468420

Table 2: Resolved issues – Password Manager Administration Site

Resolved issue	Issue ID
The #WORKFLOW_NAME# variable now appears correctly in emails sent by workflows.	466966
In the Q&A Policy page, translated questions are now editable even if translations are disabled for users.	452685

Table 3: Resolved issues – Password Manager Self-Service API

Resolved issue	Issue ID
Removed all unnecessary parameters from the CustomWebService endpoint of the Self-Service API (PMSelfServiceAPI).	462748

Table 4: Resolved issues – Password Manager Self-Service Site

Resolved issue	Issue ID
Fixed the Search / OK button so that it now works as intended with the possible CAPTCHA and reCAPTCHA configurations.	462845

Known issues

The following is a list of issues, including those attributed to third-party products, known to exist at the time of release.

Table 5: Known issues

Known issue	Issue ID
The Swagger page of the Password Manager Self-Service API (PMSelfServiceAPI) does not accept dynamic query strings for endpoints.	462748

Workaround

To test web services that use dynamic query strings, use a third-party tool, for example Postman.

NOTE: This issue does not affect the API's functionality, only the testing of custom web services.

When User Principal Name (UPN) is used as service account, installing a Password Manager hotfix can lock the service account.	255614
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Workaround

To solve the problem:

1. Change the service account to the domainname\username format.

Known issue	Issue ID
<ol style="list-style-type: none"> 2. Provide a password for the same service account user. 3. Install the Password Manager hotfix. 	
<p>Following a Password Manager upgrade, the General > Settings > Scheduled Tasks > Active Directory Sites task is disabled.</p> <p>Workaround</p> <p>After upgrading Password Manager to a newer version, enable the Active Directory Sites task manually.</p>	246147
<p>When scheduled from the secondary instance of the Password Manager server, the General Settings > Unregister Users task does not run.</p> <p>Workaround</p> <p>Schedule the Unregister Users task on the primary instance of Password Manager.</p>	233679
<p>If the application pool identity is a domain user with minimal permissions, then Web interface customization changes are not applied to the Self-Service and Helpdesk Sites.</p>	233658
<p>In the General Settings > Instance Reinitialization page, the Corporate phone attribute is not imported from the primary instance to the secondary instance.</p> <p>Workaround</p> <p>Update the Corporate phone attribute manually on the secondary instance to have the same value as on the primary Password Manager instance.</p>	229200
<p>If the Password Manager Self-Service Site contains an IPv6 address, the location-sensitive authentication (LSA) feature does not work.</p> <p>Workaround</p> <p>LSA currently supports IPv4 addresses only. Therefore, do not access the Password Manager Self-Service Site from an external network where the request contains an IPV6 address.</p>	221571
<p>When configuring a dictionary rule in the Password Manager Administration Site, the Policy Rules > Dictionary Rule > Enable dictionary lookup to reject passwords that contain > Beginning characters of a dictionary word setting does not work correctly if you specify only 2 beginning characters.</p> <p>Workaround</p> <p>One Identity recommends using the A complete word from the dictionary (QPMDictionary.txt) setting when configuring a dictionary rule.</p>	221468

Known issue	Issue ID
<p>If no appropriate authentication methods are configured for it, the Forgot My Password screen may appear blank in the Password Manager Self-Service Site or Helpdesk Site.</p> <p>Workaround</p> <p>In the Password Manager Administration Site, One Identity recommends configuring the Register workflow with Security Questions as one of its registration modes.</p>	221389
<p>When a symmetry rule is configured with the Policy Rules > Symmetry Rule setting of the Password Manager Administration Site, it may fail to validate passwords containing non-consecutive characters.</p> <p>Workaround</p> <p>Do not use the Policy Rules > Symmetry Rule > Maximum number of consecutive characters within a password, that read the same in both directions (pass4554word) setting.</p>	220177
<p>In a Password Manager for AD LDS environment, if the User Scope is configured with an AD LDS account, the Forgot My Password and Manage My Passwords workflows will fail.</p> <p>Workaround</p> <p>When configuring a User Scope, do not use The following AD LDS account setting of the Access account > Edit AD LDS Instance Connection dialog.</p>	220171
<p>When a Questions and Answers Policy is updated with any language other than English, users may receive both the default and the custom email notifications on the Password Manager Self-Service Site.</p> <p>Workaround</p> <p>For the Email user if workflow succeeds workflow, change the value of the Select email template to use setting to Customize.</p>	219401
<p>Upgrading Password Manager from version 5.6.3 to 5.9.x keeps the previous My Questions and Answers profile workflow.</p> <p>Workaround</p> <p>To solve the problem:</p> <ol style="list-style-type: none"> 1. In the Password Manager Administration Site, navigate to the My Questions and Answers profile workflow. 2. Open Workflow Settings > Availability. 3. Set Enable the workflow to Never. 4. Select Show the workflow on the Self-Service Site. 5. To apply your changes, click OK. 	215892

Known issue	Issue ID
The User Status Statistics scheduled task may fail intermittently.	171590
After upgrading to Password Manager 5.9.x, the My Notifications custom workflow cannot be edited in the Password Manager Self-Service Site.	171589
Workaround	
One Identity recommends to use the Self-Service Site to edit the My Notifications workflow.	
When using Password Manager for AD LDS, the Password Policies page of the Administration Site is not updated when a password policy is created.	170587
Workaround	
After a new Password Policy is created, click Save , and immediately cancel the Add New Policy wizard. The page will refresh and list the new policy.	
After upgrading to Password Manager for AD LDS 5.9.x, the General Settings > Search and Logon Options menu may display an error when its settings are modified.	170560
Workaround	
To solve this problem:	
<ol style="list-style-type: none"> 1. In the Password Manager for AD LDS Helpdesk Site, navigate to General Settings > Search and Logon Options. 2. In the Users must enter the following user account attribute for identification setting, change the value from <code>sAMAccountName</code> to <code>cn</code>. 	
In Password Manager for AD LDS, certain column data required for custom activities are not available in generated reports.	170355
After upgrading Password Manager from an earlier version to 5.9.x, the upgrade process may create duplicate URL references for the Password Manager User Site.	169921
Workaround	
Manually delete URL shortcuts that are not required.	
When a Password Manager for AD LDS instance and the Password Manager for AD LDS server instance are not configured on the same machine, Password Policy Rules are not displayed in the Password Manager for AD LDS Self-Service Site.	169763
Workaround	
Configure the Password Manager for AD LDS instance and the Password Manager for AD LDS server instance on the same machine.	
The user search settings of the Password Manager for AD LDS Helpdesk Site	169384

Known issue**Issue ID**

may work incorrectly.

Workaround

To solve the problem:

1. In the Password Manager for AD LDS Helpdesk Site, navigate to **General Settings > Search and Logon Options**.
2. Use the **cn** attribute instead of **mail** to search for users.

The Password Manager Self-Service Site may not launch on Secure Password Extension (SPE) through a 32-bit operating system.

167871

Workaround

If you have a 32-bit operating system, One Identity recommends to use the Self-Service Site.

When a password is changed from the target Active Directory (AD) system to that of the source AD, One Identity Quick Connect may be unable to synchronize passwords.

167573

Workaround

Restart the Quick Connect Capture Agent Service on all the source and target systems.

In Password Manager versions 5.8.2 and 5.9.x, you can only reconnect to a domain on the second attempt.

166950

Workaround

To solve the problem:

1. In the Password Manager Administration Site, select the User Scope, Helpdesk Scope or Password Policy you want to configure.
2. Click **Add domain connection** twice to add a new domain connection.

In email notifications, the #OPERATOR_ACCOUNT_NAME#, #OPERATOR_IP#, #WORKFLOW_RESULT#, and #WORKFLOW_SUMMARY# parameters are not populated.

141728

On Windows Server 2019, the Password Manager Service and One Identity rSMS Service may stop.

127587

Workaround

To solve the problem, make sure that the domain controller machine and the clients are at two separate entities.

When editing a dictionary file between the size of 10–20 MB from a Password Policy, the web browser session may crash, and an error may appear in the Windows Event Viewer.

115957

Workaround

Known issue

Issue ID

If you must modify a dictionary file larger than 10 MB, edit it from the domain machine where Password Policy Manager (PPM) is installed.

When performing a password reset with the Password Manager Helpdesk Site, the site also accepts the previous/old password.

114822

Workaround

Manually enter a different password during the short duration of the password reset.

System requirements

Before installing Password Manager 5.14.3, ensure that your system meets the following minimum hardware and software requirements.

NOTE: When setting up a virtual environment, carefully consider the configuration aspects such as CPU, memory availability, I/O subsystem, and network infrastructure to ensure the virtual layer has the necessary resources available. For more information about environment virtualization, see [One Identity's Product Support Policies](#).

Password Manager Service and Administration Site requirements

Before installing Password Manager, ensure your system meets the following minimum hardware and software requirements. These requirements are applicable both to Full Installation and Distributed Installation (when the Self-Service Site and the Helpdesk Site are installed on separate systems).

Table 6: Password Manager Service and Administration Site requirements

Requirement	Details
Platform	1.6 GHz or higher.
Memory	At least 4 GB RAM.
Hard disk space	2.7 GB of free disk space. NOTE: If .NET Framework is already installed, then installation may require less disk space.
Operating system	Password Manager can be run on any of the following operating systems: <ul style="list-style-type: none">• Microsoft Windows Server 2016

Requirement	Details
	<ul style="list-style-type: none"> • Microsoft Windows Server 2019 • Microsoft Windows Server 2022 <p>NOTE: Consider the following operating system and machine restrictions:</p> <ul style="list-style-type: none"> • Password Manager is not supported on Windows Server Core mode setup. • One Identity does not recommend installing Password Manager on the machine where the Domain Controller (DC) server is installed. • Password Manager supports Windows Server 2016 and later versions in domain and forest functional levels, including domains operating in a mixed mode. • Password Manager does not support Windows Server 2012 R2 and earlier versions.
Internet Information Services	<p>Password Manager requires any of the following Microsoft Internet Information Services (IIS) versions on the web server of your environment:</p> <ul style="list-style-type: none"> • IIS 8.0 • IIS 10.0 <p>NOTE: PMSelfService site requires IIS 10.</p> <p>TIP: To ensure best practice security, configure Password Manager to use HTTPS. For more information, see <i>Password Manager 5.14.3 Administrator Guide</i> or <i>Password Manager 5.14.3 Administrator Guide (AD LDS Edition)</i>.</p>
Web browser	<p>Password Manager supports the following web browsers:</p> <ul style="list-style-type: none"> • Microsoft Edge • Mozilla Firefox 10 or later • Apple Safari 5 or later • Google Chrome 15 or later
Microsoft .NET Framework	<p>Microsoft .NET Framework 4.7.2</p> <p>NOTE: Install .NET Framework before you install Password Manager.</p>
Visual C++ Runtime Libraries	<p>Password Manager supports the following Visual C++ Runtime Libraries:</p> <ul style="list-style-type: none"> • Visual C++ Runtime Libraries 2017 • Visual C++ Runtime Libraries 2010

Requirement	Details
	<p>Visual C++ Runtime Libraries x86 and x64 are included in the Password Manager distribution package.</p> <p>NOTE: Install Visual C++ Runtime Libraries 2010 and Visual C++ Runtime Libraries 2017 before you install Password Manager.</p>
Minimum screen resolution	1280x1024 pixels

Password Manager Self-Service Site requirements

Make sure that every client computer meets the following minimum software requirements:

Table 7: Password Manager Self-Service Site requirements

Requirement	Details
Web browser	<p>The Password Manager Self-Service Site supports the following browsers:</p> <ul style="list-style-type: none"> • Microsoft Edge • Mozilla Firefox 10 or later • Apple Safari 5 or later • Google Chrome 15 or later
Mobile web browser	<p>The Password Manager Self-Service Site supports the following mobile browsers:</p> <ul style="list-style-type: none"> • Microsoft Edge • Mozilla Firefox • Apple Safari • Google Chrome • DuckDuckGo • Samsung Internet
Minimum screen resolution	1280x1024 pixels

Password Manager Helpdesk requirements

Make sure that every client computer meets the following minimum software requirements:

Table 8: Password Manager Helpdesk Site requirements

Requirement	Details
Web browser	The Password Manager Helpdesk Site supports the following browsers: <ul style="list-style-type: none">• Microsoft Edge• Mozilla Firefox 10 or later• Apple Safari 5 or later• Google Chrome 15 or later
Minimum screen resolution	1280x1024 pixels

Password Policy Manager requirements

To implement password policies in an Active Directory (AD) domain managed by Password Manager, deploy the Password Policy Manager component on all domain controllers of the managed domain.

The domain controllers where you plan to install the Password Policy Manager component must meet the following requirements:

Table 9: Password Policy Manager Requirements

Requirement	Details
Hard disk space	30 MB of free hard disk space.
Operating system	Password Policy Manager supports the following operating systems: <ul style="list-style-type: none">• Microsoft Windows Server 2016• Microsoft Windows Server 2019• Microsoft Windows Server 2022 <p>NOTE: Password Manager does not support Windows Server Core mode setup.</p>

Secure Password Extension requirements

To support password resets from the Windows login screen, you must deploy Secure Password Extension on all target computers in the managed domain. The target computers must meet the following minimum software requirements:

Table 10: Secure Password Extension requirements

Requirement	Details
Operating system	Secure Password Extension supports the following operating systems: <ul style="list-style-type: none">• Microsoft Windows 10• Microsoft Windows 11

Offline Password Reset requirements

To allow users to reset their forgotten passwords when they are not connected to the corporate network (making their domain unavailable), deploy the Offline Password Reset component on all target computers in the managed domain.

NOTE: Users can reset their passwords offline only if the Offline Password Reset component has been already installed prior to their scheduled password reset time.

The target computers must meet the following minimum software requirements:

Table 11: Offline Password Reset requirements

Requirement	Details
Operating system	The Offline Password Reset component supports the following operating systems: <ul style="list-style-type: none">• Microsoft Windows 10• Microsoft Windows 11 <p>NOTE: Password Manager does not support Windows Server Core mode setup.</p>

Password Manager Reports requirements

To configure and use Password Manager reports, you must:

1. Install an SQL server in your environment.
2. Configure reporting settings on the Password Manager Administration Site. For more

information, see *Reporting in Password Manager 5.14.3 Administration Guide* or *Password Manager 5.14.3 Administration Guide (AD LDS Edition)*.

The report definitions included with Password Manager support all features of the SQL server versions listed in this section. All supported Microsoft SQL Server Reporting Services in Password Manager support SSL connection.

Table 12: Password Manager Reports requirements

Requirement	Details
SQL Server	The following SQL Server versions are supported: <ul style="list-style-type: none">• Microsoft SQL Server 2016• Microsoft SQL Server 2017• Microsoft SQL Server 2019• Microsoft SQL Server 2022

Accessing External URLs

To enable Password Manager to download images:

- The machine where Password Manager is installed must have an active Internet access.

Product licensing

Password Manager requires a license key for operation. For more information on license management, see *Licensing* in the *Password Manager 5.14.3 Administration Guide* or the *Password Manager 5.14.3 Administration Guide (AD LDS Edition)* documents.

Upgrade and installation instructions

For more information on how to install or upgrade Password Manager, see the following resources:

- When you upgrade Password Manager from versions prior 5.11.3 and Secure Token Server features are used, create a backup of **Rsts.exe.config** in <password-manager-install-folder>\Service\SecureTokenServer. When the upgrade is finished, restore these files.

This procedure is not required for upgrades starting from version 5.12.3.

- If in any of the workflows in the **Authentication Methods** activity is used with the **Personal Email: Authenticate with Passcode** method, administrators must reconfigure this activity.
- For more information on the upgrade procedure, see *Upgrading Password Manager* in the *Password Manager 5.14.3 Administration Guide* or the *Password Manager 5.14.3 Administration Guide (AD LDS Edition)* documents.

You can upgrade to Password Manager 5.14.3 from version 5.9.x or later.

- For more information on how to install and configure Password Manager, see *Installing Password Manager* in the *Password Manager 5.14.3 Administration Guide*, *Password Manager 5.14.3 Administration Guide (AD LDS Edition)*, or the *Password Manager 5.14.3 Quick Start Guide* documents.

Globalization

This section contains information about installing and operating this product in non-English configurations, such as those needed by customers outside of North America. This section does not replace the materials about supported platforms and configurations found elsewhere in the product documentation.

This release is Unicode-enabled and supports any character set. It supports simultaneous operation with multilingual data. This release is targeted to support operations in the following regions: North America, Western Europe and Latin America, Central and Eastern Europe, Far-East Asia, Japan.

The release is localized to the following languages: Chinese (Simplified), Chinese (Traditional), Czech, Danish, Dutch, French, German, Italian, Japanese, Korean, Polish, Portuguese (Brazil), Portuguese (Portugal), Russian, Spanish, Swedish.

The Password Manager Self-Service Site is not localized in any language other than English.

About us

One Identity solutions eliminate the complexities and time-consuming processes often required to govern identities, manage privileged accounts and control access. Our solutions enhance business agility while addressing your IAM challenges with on-premises, cloud and hybrid environments.

Contacting us

For sales and other inquiries, such as licensing, support, and renewals, visit <https://www.oneidentity.com/company/contact-us.aspx>.

Technical support resources

Technical support is available to One Identity customers with a valid maintenance contract and customers who have trial versions. You can access the Support Portal at <https://support.oneidentity.com/>.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request
- View Knowledge Base articles
- Sign up for product notifications
- Download software and technical documentation
- View how-to videos at www.YouTube.com/OneIdentity
- Engage in community discussions
- Chat with support engineers online
- View services to assist you with your product

Third-party contributions

This product contains some third-party components (listed below). Copies of their licenses may be found at referencing <https://www.oneidentity.com/legal/license-agreements.aspx>. Source code for components marked with an asterisk (*) is available at <http://opensource.quest.com>.

Component	License of Acknowledgement
@angular/cdk 16.2.14	Licensed under the MIT license. For the license text, see: https://github.com/angular/components?tab=MIT-1-ov-file#readme
@angular/cli 16.2.12	Licensed under the MIT license. For the license text, see: https://github.com/angular/angular-cli?tab=MIT-1-ov-file#readme
@ngx-translate/core 14.0.0	Licensed under the MIT license. For the license text, see: https://opensource.org/license/MIT
@ngx-translate/http-loader 7.0.0	Copyright © 2018 Olivier Combe Licensed under the MIT license. For the license text, see: https://github.com/ngx-translate/http-loader?tab=MIT-1-ov-file#readme
@types/jest 29.5.12	Licensed under the MIT license. For the license text, see: https://github.com/DefinitelyTyped/DefinitelyTyped?tab=License-1-ov-file#readme
@types/node 12.20.55	Licensed under the MIT license. For the license text, see: https://github.com/DefinitelyTyped/DefinitelyTyped?tab=License-1-ov-file#readme
ANTLR 3.4.1.9004	Copyright © 2010 Terence Parr Licensed under the ANTLR 3 License (the BSD License). For the license terms, see: https://wwwantlr3.org/license.html
billboard.js 3.10.3	Copyright © 2017 NAVER Corp. Copyright© 2013 Masayuki Tanaka Licensed under the MIT license. For the license terms, see: https://github.com/naver/billboard.js/blob/master/LICENSE
CefSharp Chromium 126.2.7	Copyright © The CefSharp Authors. All rights reserved.

Component	License of Acknowledgement
copyfiles 2.4.1	<p>Licensed under Chromium License 2015 1.0. For the license terms, see:</p> <p>https://raw.githubusercontent.com/cefsharp/CefSharp/master/LICENSE</p>
core-js 3.35.1	<p>Copyright © 2014-2018 Calvin Metcalf</p> <p>Licensed under the MIT license. For the license terms, see:</p> <p>https://github.com/calvinmetcalf/copyfiles/blob/master/license.md</p>
eslint 8.56.0	<p>Copyright © 2014-2024 Denis Pushkarev</p> <p>Licensed under the MIT license. For the license terms, see:</p> <p>https://github.com/zloirock/core-js/blob/master/LICENSE</p>
file-saver 2.0.5	<p>Copyright © OpenJS Foundation and other contributors.</p> <p>Licensed under the MIT license. For the license terms, see:</p> <p>https://github.com/eslint/eslint/blob/main/LICENSE</p>
Inheritance N/A	<p>Copyright © 2016 Eli Grey</p> <p>Licensed under the MIT license. For the license terms, see:</p> <p>https://github.com/eligrey/FileSaver.js?tab=License-1-ov-file#readme</p>
jest 29.7.0	<p>Licensed under the MIT license. For the license text, see:</p> <p>https://opensource.org/license/mit</p>
jest-jasmine2 29.7.0	<p>Copyright © Meta Platforms, Inc. and affiliates.</p> <p>Copyright © Contributors to the Jest project.</p> <p>Licensed under the MIT license. For the license text, see:</p> <p>https://github.com/jestjs/jest/blob/main/LICENSE</p>
jest-jasmine2 29.7.0	<p>Copyright © Meta Platforms, Inc. and affiliates.</p> <p>Copyright © Contributors to the Jest project.</p> <p>Licensed under the MIT license. For the license text,</p>

Component	License of Acknowledgement
	see: https://github.com/jestjs/jest/blob/main/LICENSE
jest-preset-angular 13.1.6	Copyright © 2017 Michał Pierzchała Licensed under the MIT license. For the license terms, see: https://github.com/thymikee/jest-preset-angular/blob/main/LICENSE.md
jQuery 3.6.4	Copyright © 2017 jquery-form Licensed under the MIT license. For the license terms, see: https://github.com/jquery-form/form/blob/master/LICENSE-MIT
jQuery Form Plugin 3.51	Copyright © 2017 jquery-form Licensed under the MIT license. For the license terms, see: https://github.com/jquery-form/form/blob/master/LICENSE-MIT
jQuery miniColors 1.0	Licensed under the MIT license. For the license text, see: https://opensource.org/license/MIT
jQuery Validation 1.19.3	Copyright © Jörn Zaefferer Licensed under the MIT license. For the license text, see: https://github.com/jquery-validation/jquery-validation/?tab=MIT-1-ov-file#readme
jquery.address 1.6	Copyright © 2006-2009 Rostislav Hristov, Asual DZZD Licensed under the MIT license. For the license text, see: https://github.com/asual/jquery-address/blob/master/MIT-LICENSE
Jquery.meio.mask 1.1.14	Copyright © 2008-2014 Fábio M. Costa and contributors Licensed under the MIT license. For the license text, see: https://github.com/fabiomcosta/jquery-

Component	License of Acknowledgement
	meiomask?tab=MIT-1-ov-file#readme
jQuery.TextInputs 0.1.205	Copyright © 2014 Tim Down Licensed under the MIT license. For the license text, see: https://github.com/timdown/rangy/tree/master?tab=MIT-1-ov-file#readme
jQuery.UI.Combined 1.13.2	Copyright © jQuery Foundation and other contributors Licensed under the MIT license. For the license text, see: https://github.com/jquery/jqueryui.com?tab=License-1-ov-file#readme
Jquery.watermark 3.1.4	Licensed under the MIT license. For the license text, see: https://opensource.org/license/MIT
Json Org v2	Public Domain. NO WARRANTY EXPRESSED OR IMPLIED. USE AT YOUR OWN RISK.
Knockout 3.5.1	Copyright © 2010 Steven Sanderson, the Knockout.js team, and other contributors Licensed under the MIT license. For the license text, see: https://github.com/knockout/knockout/blob/master/LICENSE
libphonenumber-csharp 8.8.11	Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Lucene.Net 3.0.3	Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
material/layout-grid 14.0.0	Copyright © 2014-2020 Google, Inc. Licensed under the MIT license. For the license text, see: https://github.com/material-components/material-components-web/blob/master/LICENSE
Microsoft.AspNet.SignalR.Client 2.4.0	Copyright © .NET Foundation. All rights reserved.

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Microsoft.AspNet.WebApi.Client 5.2.7	Copyright © .NET Foundation. All rights reserved. Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.AspNetCore.Connections.Abstractions 2.2.0	Copyright © .NET Foundation. All rights reserved. Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.AspNetCore.Http.Connections.Client 1.1.0	Copyright © .NET Foundation. All rights reserved. Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.AspNetCore.Http.Connections.Common 1.1.0	Copyright © .NET Foundation. All rights reserved. Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.AspNetCore.Http.Features 2.2.0	Copyright © .NET Foundation. All rights reserved. Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.AspNetCore.SignalR.Client 1.1.0	Copyright © .NET Foundation. All rights reserved. Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.AspNetCore.SignalR.Client.Core 1.1.0	Copyright © .NET Foundation. All rights reserved. Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.AspNetCore.SignalR.Common 1.1.0	Copyright © .NET Foundation. All rights reserved. Licensed under the Apache 2.0 license. For the

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Microsoft.AspNetCore.SignalR.Protocols.Json 1.1.0	Copyright © .NET Foundation. All rights reserved. Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.CSharp 4.7.0	Licensed under the MIT license. For the license text, see: https://opensource.org/license/MIT
Microsoft.Extensions.Configuration 2.2.0	Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.Extensions.Configuration.Abstractions 2.2.0	Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.Extensions.Configuration.Binder 2.2.0	Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.Extensions.DependencyInjection 2.2.0	Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.Extensions.DependencyInjection.Abstractions 2.2.0	Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.Extensions.Logging 2.2.0	Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.Extensions.Logging.Abstractions 2.2.0	Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.Extensions.ObjectPool 2.1.0	Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.Extensions.Options	Licensed under the Apache 2.0 license. For the

Component	License of Acknowledgement
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Microsoft.Extensions.Primitives 2.2.0	Licensed under the Apache 2.0 license. For the license terms, see: https://licenses.nuget.org/Apache-2.0
Microsoft.IdentityModel.JsonWebTokens 5.7.0	Licensed under the MIT license. For the license text, see: https://opensource.org/license/MIT
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Legend

-  **WARNING:** A WARNING icon highlights a potential risk of bodily injury or property damage, for which industry-standard safety precautions are advised. This icon is often associated with electrical hazards related to hardware.

-  **CAUTION:** A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.