

Quest® IT Security Search 11.4.1

Update 2 Release Notes

January 2020

These release notes provide information about the Quest® IT Security Search Update 2 release.

About this release

IT Security Search provides IT administrators, IT managers and security teams with a way to navigate the expanse of information about the enterprise infrastructure.

i | **IMPORTANT:** This document is for IT Security Search 11.4.1 and Update 2 for this version. IT Security Search 11.4.1 Update 2 can be installed only on top of version 11.4.1 with or without Update 1.

New features

New features in IT Security Search 11.4.1 Update 2:

- **Group membership and traversal functions in search queries**

In an IT Security Search query, a function transforms the results of a smaller query to other objects. IT Security Search functions take a query as their single argument and return a collection of objects. Functions work only for data provided by the Warehouse connector. The following functions are available at this time:

- **Members**
Returns the direct members of all groups that the argument query returned.
- **Members_Deep**
Returns both direct and indirect members of all groups that the argument query returned.
- **MemberOf**
Returns all groups that directly contain the accounts returned by the argument query.
- **MemberOf_Deep**
Returns all groups that directly or indirectly contain the accounts returned by the argument query.

You can condense advanced use scenarios to compact function-powered queries. For example, if you want events from all computers where user **martystu** is an administrator, it can be done with a single query like this:

```
memberof_Deep(Who=martystu) AccountSID="S-1-5-32-544" | Where="{DomainName}"  
Who=martystu
```

For details about how this particular query works, see [Using Functions in Queries](#).

- **Feature preview: [Splunk connector](#)**

New features in IT Security Search 11.4.1 Update 1:

- **Advanced multi-stage search language (search-in-search capabilities)**

Transfer the results of a search to the next search in a row; the results flow without interruptions. Each of your established search workflows can now be consolidated into a single search query. This feature relies on the familiar pipe syntax used by shell languages and various search APIs. For more details, see [Search Term Syntax](#).

- **Context parameter for currently logged-on user**

The parameter can help configure flexible role-based access for groups and users or make searches (saved and regular) tuned for self-audit purposes. If you specify the **{Context.CurrentUser}** variable in your query, it is automatically resolved to information that identifies the currently logged-on user. Use the parameter in search queries and in operator scope-limiting queries that define role-based access.

- **Customizable columns in the event grid**

In the event result grid, the new **Columns** drop-down menu provides tools for specifying which event fields to display. The layout you configure is also kept in the PDF and CSV files that you export the search results to.

New in IT Security Search 11.4.1:

- **Improved Hybrid Active Directory forensics**

A number of new Azure object properties are now available in search results, including the following:

- Permissions for Azure applications
- Security rules for network security groups
- Membership details for Azure users and groups

In addition, Azure events collected by Change Auditor now contain links to the details of Azure objects that occur in the **Who** and **Whom** fields.

- **Fine-grained scope definition for IT Security Search operators**

You can now use regular search queries to fine-tune the scope of objects visible to IT Security Search operators. For example, this helps segregate information that users can see based on Active Directory domain or a Azure tenant.

- **FIPS 140-2 mode compatibility**

IT Security Search can now function in Microsoft Windows environments where FIPS 140 revision 2 (FIPS 140-2) mode is enabled. For more information about FIPS 140-2 mode, see <https://docs.microsoft.com/en-us/windows/security/threat-protection/security-policy-settings/system-cryptography-use-fips-compliant-algorithms-for-encryption-hashing-and-signing>.

- **Feature preview: HTTPS API for forwarded Change Auditor events**

See also:

- [Enhancements](#)
- [Resolved issues](#)

Feature Previews

IT Security Search 11.4.1 Update 2 contains early implementations of features that will be completed in the coming versions. These feature previews are provided as-is, so that you can try them out, give us feedback and help us make them more useful in future releases.

HTTPS API for Forwarded Change Auditor Events

The Warehouse connector provides preliminary support for retrieval of forwarded Change Auditor data.

Before You Begin

First, make sure the **ITSS.Warehouse** service is running on your IT Security Search server. This is required for a successful Change Auditor subscription.

Getting Change Auditor Ready

To make Change Auditor push audit data to Warehouse, run the **CreateCAITSSEventSubscription.ps1** PowerShell script, which is located in the **<Change Auditor installation folder>\Client\PowerShell Sample Scripts** folder on your Change Auditor coordinator. This will start a multi-step configuration procedure in the command prompt, where you will need to specify the settings for your particular environment.

The following are examples of values that you can supply for some of the prompts:

- Specify Change Auditor installation name
DEFAULT
- Enter the number(s) of the subsystem events to be forwarded (separate multiple entries with commas)
1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18
- Specify the destination URL and port for the ITSS warehouse instance
https://myitssserver:443/warehouse/changeauditor/events



NOTE: To find out which port is used, check the **HKEY_LOCAL_MACHINE\SOFTWARE\Quest\IT Security Search Warehouse API\ListenPort** registry value on the IT Security Search server. To see whether HTTPS is used instead of HTTP, check the **HKEY_LOCAL_MACHINE\SOFTWARE\Quest\IT Security Search Warehouse API\ListenScheme** registry value.

- Enter a coordinator DNS or NetBIOS name (or press enter to finish)
mycacoordinatorvm1,someothercacoordinatorvm9

The following additional scripts are also provided to let you manage your IT Security Search subscriptions:

- **GetCAITSSEventSubscriptions.ps1**
- **ModifyCAITSSEventSubscription.ps1**
- **RemoveCAITSSEventSubscription.ps1**.

Getting IT Security Search Ready



IMPORTANT:

- It is not recommended that you use the Change Auditor connector and the Warehouse connector to get data from the same Change Auditor coordinator at once. This will result in duplicate events in your searches.
- For this feature preview, the lifetime of stored Change Auditor events is limited to 30 days after their "Time Detected" date. Older events are automatically purged from the Warehouse.

At this time, the Warehouse connector settings in the web UI do not expose Change Auditor-related options. You need to edit the configuration file manually.

To set up retrieval of Change Auditor data from Warehouse

1. On your IT Security Search server, make sure the **%ProgramData%\Quest\IT Security Search\settings.xml** file exists. If it doesn't, this means IT Security Search settings have never been configured. To make IT Security Search create the file, you can change some minor option, save the settings and then change it back and save the settings again.
2. Stop the **ITSS.Server** (Quest IT Security Search) service.
3. Open the **%ProgramData%\Quest\IT Security Search\settings.xml** file in a text editor.
4. Change this:

```
<connector active='false' key='WarehouseCA'>
```

to this:

```
<connector active='true' key='WarehouseCA'>
```
5. Save the configuration file.
6. Start the **ITSS.Server** (Quest IT Security Search) service.

After you have completed these steps, data pushed by Change Auditor to Warehouse should appear in your searches.

Splunk Connector

The new Splunk connector provides preliminary support for retrieval of searchable data from Splunk. The connector is available in the **Data Sources** list in freshly installed IT Security Search 11.4.1 Update 2.

The connector has the following minimal configuration options:

- Splunk server URI
- The user name and password of the account to use for access to Splunk

One additional setting that you may want to configure is the number of retrieved Splunk results. By default, Splunk returns 50,000 objects, whereas IT Security Search shows 100,000 per page. To make these limits consistent, take the following steps:

1. On the Splunk server, open (or create if necessary) the **%programfiles%\Splunk\etc\system\local\limits.conf** file (on Windows) or **/opt/splunk/etc/system/local/limits.conf** file (on Linux) in a text editor.
2. Add the following lines to the file:

```
[restapi]
maxresultrows = 100000
```
3. Restart Splunk.

IT Security Search provides a predefined Splunk-to-IT Security Search field mapping. If you find that this mapping doesn't suit you, call Quest Support. This will help improve Splunk integration for you and everyone else.

Enhancements

Table 1: General enhancements in IT Security Search 11.4.1 Update 2

Enhancement	Issue ID
In situations where a search finds nothing directly but produces results of a type that you aren't looking for, there is now a suggestion that you check those results.	IS-2410
When you configure the InTrust connector, you can now specify multiple repositories at once.	IS-2702
The Reset Settings action link is now available on all connector configuration pages so that you can easily restore the default values.	IS-2166
If you change the set of columns in the result grid while any rows are selected or any facets or filters enabled, your filters and row selection are not cleared anymore in the updated grid.	IS-2455, IS-2167
Search queries that explicitly specify the types of objects to look for are now optimized for that case and run faster on large sets of data.	IS-2120
You can now sort the item groupings by number of items, in descending or ascending order.	IS-854

Enhancement	Issue ID
Sorting in ascending order helps you focus on seldom-occurring items, which may be the most relevant.	
IT Security Search now shows a link to a dedicated video playlist (https://www.quest.com/ITSSVideos) with tips and feature demos. The link is available on the About screen (click the question mark icon to get there).	IS-1407

Table 2: General enhancements in IT Security Search 11.4.1 Update 1

Enhancement	Issue ID
Now the InTrust suite setup has an option to download IT Security Search.	IN-9122
In compliance with recommended security practices, the use of localhost and IP address 127.0.0.1 for setting up connection between IT Security Search services is now disallowed. For the same reason, the New-SslCertificate.ps1 script doesn't create self-signed certificates for localhost and 127.0.0.1 anymore.	IS-1466

Table 3: General enhancements in IT Security Search 11.4.1

Enhancement	Issue ID
There have been across-the-board performance improvements: searches now start faster, and the user interface is generally more responsive.	IS-1293
You can now fine-tune the column layout for export of search results to CSV or PDF. For that, use the new ITSS-ExportFields.psm1 PowerShell script that comes with IT Security Search. The script lets you rearrange and resize columns for arbitrary object types. For details, see Additional Utility Scripts .	IS-1220
The welcome wizard that was previously shown by default on the IT Security Search landing page has been replaced by an unobtrusive notification popup.	IS-1003
In the Active Roles connector settings, error reporting has been improved for connection tests.	IS-936
The Warehouse installer now automatically supplies the current user account in the Account name field.	IS-703
A major update of third-party components was made, including an update of Elasticsearch to version 2.4.4. The newer Elasticsearch component helped resolve a known issue where IT Security Search generated huge logs daily.	IS-1456
During installation and upgrade, IT Security Search setup now clearly states which services it requires and tells you what to do if they are stopped.	IS-1427
IT Security Search setup now lets you customize where Warehouse keeps its data stores.	IS-807
Display of Azure objects in search results has been improved: more properties are shown for them, and each Azure object type has its own set of relevant columns.	IS-1750, IS-1596

Deprecated features

The Enterprise Reporter connector is being phased out. In future versions, support for Enterprise Reporter data will be provided only in the IT Security Search Warehouse connector, which will have all the features of the current Enterprise Reporter connector and more.

Currently, using the Enterprise Reporter connector is recommended only if you work with information about effective permissions. Otherwise, consider switching to the IT Security Search Warehouse connector.

Resolved issues

The following is a list of issues addressed in IT Security Search 11.4.1 Update 2.

Table 4: Resolved issues in IT Security Search 11.4.1 Update 2

Resolved Issue	Issue ID
<p>When you run searches on data provided by Enterprise Reporter, you get the following error message:</p> <pre>Ambiguous column name 'WhenCreated'.</pre> <p>This is caused by changes in the Enterprise Reporter database schema in version 3.2.1.</p>	IS-2707
<p>IT Security Search uses an unreliable account impersonation method for connection to SQL Server. As a result, the connection uses the computer account of the IT Security Search server, and this fails with an error like the following:</p> <pre>System.Data.SqlClient.SqlException (0x80131904): Login failed for user 'domain_name\itss_server_name\$'.</pre>	IS-2757
<p>If the network link used by any of the enabled IT Security Search connectors is slow, then it takes a long time to show the details pages for items and may make the application unresponsive indefinitely. This happens even where no data from that connector is actually used.</p>	IS-2780, IS-2788
<p>If you add tabs to the result grid and later try to remove them by clicking their cross icons, in some situations the tabs stay there.</p>	IS-1736

The following issues were resolved in previous releases of IT Security Search.

Table 5: Resolved issues in IT Security Search 11.4.1 Update 1

Resolved Issue	Issue ID
<p>If an IT Security Search operator's scope is limited by a query that contains the name of a specific field (for example, Source="Active Roles"), then that operator may not be able to view details pages when clicking the links in search results.</p>	IS-2023
<p>If the data store for the Warehouse component is in a network share that is not hosted on the IT Security Search server, then Active Roles events can be absent from search results.</p>	IS-1783
<p>Indexing of effective group membership data from Enterprise Reporter is slow and causes the "tempdb" database to exceed its size limit.</p>	IS-2099 IS-1159
<p>Indexing fails during calculation of group membership data from Enterprise Reporter if there is circular membership among the groups (meaning that groups are their own members through membership in other groups).</p>	IS-2121
<p>In InTrust connector settings, if you select a repository but then click Cancel, the repository is still there the next time you reopen the settings.</p>	IS-1716

Resolved Issue	Issue ID
The breadcrumbs area contains garbage.	IS-1972

Table 6: Resolved issues in IT Security Search 11.4.1

Resolved Issue	Issue ID
In some cases the Warehouse connector can produce huge error messages.	IS-1282 IS-1719
In some cases, if you pin an object type as a tab and the object type name is not all-lowercase, then you get duplicate tabs for it: one has your original spelling and the other is all-lowercase.	IS-1320
Sometimes if you copy a value from the search grid, garbage can be appended to the copied string.	IS-1310
For computer local users, "null" is shown on the Member Of tab.	IS-781
For some types of object (particularly, objects that reference other objects through attributes), when you click the View Details link, you get the details for the wrong object.	IS-1465
If you expand or collapse the contents of a facet while a search is in progress, you may get an incomplete list of results.	IS-1421
The Warehouse store index may become corrupted if the Warehouse service is stopped while the index is being built.	IS-1411
If you use negative expressions in Warehouse searches, you may get incorrect search results for Enterprise Reporter data.	IS-1440
The web UI doesn't get dates from the IT Security Search server in a consistent format. It isn't always clear which number is the month and which is the day.	IS-1659
The details view for an Active Directory account shows the Last Logon field with a timestamp taken from Active Directory. However, it's possible that there are more recent logons by the account. Information about the last logons should be available in the events view instead of the details view.	IS-1751
When you try to click a facet to filter results, it can suddenly move away from the cursor.	IS-1880
If you use the Warehouse connector for working with Enterprise Reporter data in an environment with a large number of Active Directory objects, then data for container objects with a lot of members may fail to be saved in the Warehouse store.	IS-1580
If multiple events of the same kind (meaning, with the same values in fields such as What , Who , Whom and Where) occur less than a second apart, then the View Details link for all of these events may point to the newest of them.	IS-1043

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 7: General known issues

Known Issue	Issue ID
Internet Explorer becomes unresponsive when IT Security Search shows a modal dialog box on top of the browser windows. You can work around this by minimizing all windows and clicking the close button in the modal window; Internet Explorer resumes working.	IS-360
After an IT Security Search upgrade, the layout of the controls in the web interface can appear broken (missing blocks of data, misplaced elements and so on). You can correct this by refreshing the page, preferably with a cache cleanup (Ctrl+F5).	—
During the IT Security Search Warehouse installation step of IT Security Search setup, an unused service connection point is created in Active Directory. This operation is skipped if the user account used for installation doesn't have the required privileges. Whether or not the service connection point is created, this has no effect on the installation or operation of IT Security Search.	IS-954
If you are upgrading IT Security Search from version 11.3 or later and you use data sending from Enterprise Reporter 3.0, you may need to go to Enterprise Reporter Configuration Manager and resend all data to IT Security Search. Otherwise, no pre-upgrade Enterprise Reporter data will be available to IT Security Search.	—
Search results from InTrust repositories and IT Security Search Warehouse may be incomplete. Eligible objects will be skipped if their names contain any of the following characters: . @ " This issue affects the following: <ul style="list-style-type: none">• Searches for InTrust-provided events• Searches for data stored in IT Security Search Warehouse (Enterprise Reporter data and Active Roles events)• Results from the Test query link in operator scope options (on the IT Security Search Settings page, on the Security tab)	IS-1162
The IT Security Search Warehouse component may become inaccessible if you reinstall IT Security Search into the same organization where IT Security Search was previously deployed. Root-cause: Newly installed server will receive new identification and data collected by a server with another ID will not be available for it. Workaround: <ol style="list-style-type: none">1. In InTrust Deployment Manager select Storage tab2. On each Repository that have exclamation sign on the right panel on Security section, click Edit link	IS-1256

3. Specify valid InTrust server in **Managed by this server** combobox. Click **Apply**.

After the reconfiguration is finished, the following services should be started on IT Security Search server:

- **Quest IT Security Search Warehouse API**
- **Quest IT Security Search Active Roles Data Attendant**

It is recommended to either deploy a separate InTrust organization for IT Security Search every time you install the server or always perform the reconfiguration. InTrust system protects data collected by a specific server and prevents unauthorized access even for queries from the same computer.

System requirements

Before installing IT Security Search 11.4.1 Update 2, ensure that your system meets the following minimum hardware and software requirements.

Compatibility

The following versions of data-providing systems are supported in this version of IT Security Search:

- InTrust 11.4.1, 11.4, 11.3.2, 11.3.1, 11.3
- Change Auditor 7.0.3, 7.0.2, 7.0.1, 7.0, 6.9.5, 6.9.4, 6.9.3, 6.9.2, 6.9.1, 6.9
- Enterprise Reporter 3.2.1, 3.2, 3.1, 3.0
- Recovery Manager for Active Directory 10.0.1, 10.0, 9.0.1, 9.0, 8.8.1
- Active Roles 7.4.1, 7.4, 7.3.2, 7.3.1, 7.2.1, 7.2, 7.1

Software Requirements

- Operating system:
 - Microsoft Windows Server 2019
 - Microsoft Windows Server 2016
 - Microsoft Windows Server 2012 R2
 - Microsoft Windows Server 2012
 - Microsoft Windows Server 2008 R2

- Additional software:
 - Microsoft .NET Framework 4.7.2 or later
 - Microsoft Windows PowerShell 3.0 or later
 - Microsoft SQL Server 2012 or later (all editions)
This is a requirement of the IT Security Search Warehouse component, which needs it for internal configuration management.
- Additional requirements for the Recovery Manager for Active Directory connector:
 - Enable remote commands in Windows PowerShell. For details, see <https://technet.microsoft.com/en-us/magazine/ff700227.aspx>.
 - The PowerShell script execution policy must be set to **RemoteSigned**. Run the following cmdlet:
`Set-ExecutionPolicy RemoteSigned`
- Additional requirements for the Active Roles connector:
 - Active Roles Management Tools
 - The PowerShell script execution policy must be set to **RemoteSigned**.

Browser Compatibility

The IT Security Search Web interface works correctly with the following browsers:

- Microsoft Edge
- Microsoft Internet Explorer 11
- Google Chrome 72.0 or later
- Mozilla Firefox 65.0 or later

The minimum supported monitor resolution is 1024x768.

Hardware Requirements

- CPU: 6 cores minimum; 16 cores recommended
- RAM: 8GB minimum; 16GB or more recommended
- Disk: 200GB (SSD recommended); disk space requirements are very dependent on the volume of Enterprise Reporter and Active Roles data being processed, because the index size varies proportionally; the indexes for Change Auditor, Recovery Manager for AD and InTrust data do not consume any disk space on the IT Security Search computer, because they are located in the data stores used by these systems
- If you deploy on a virtual machine, make sure the CPU and memory requirements above are met, and do not overload the virtual machine host

To find out the disk requirements for IT Security Search installation, consider the sections below. They describe how much disk space is used for indexing data provided by specific connectors.

Disk Space for Legacy Enterprise Reporter Data

These numbers are for a sample environment with 10000 of each type of Enterprise Reporter object. Scale the values according to your own circumstances.

Object type	Size of an index entry	Number of objects	Size of the index
Computers	1KB	10000	10MB
Files	0.2KB	10000	2MB
Groups	2.5KB	10000	25MB
Shares	1KB	10000	10MB
Users	2KB	10000	20MB
Total		50000	67MB

Disk Space for Enterprise Reporter Data in Warehouse

These are the average index entry sizes for each type of Enterprise Reporter object. Use them in calculating the required disk space for your particular on-premises or hybrid environment.

Note that there are generally multiple index entries per object, depending on how often objects are changed.

Object type	Average size of an index entry, in kilobytes
AD Permissions	2.1
AD Contacts	3.3
Computers	1.6
Groups	1.5
Files	1.5
OUs	2.3
Shares	2.1
Users	1.6
Azure Applications	1.6
Azure Contacts	1.6
Azure Devices	5
Azure Groups	1.4
Azure Network Security Groups	2.2

Object type	Average size of an index entry, in kilobytes
Azure Resource Groups	1.5
Azure Resource Subscriptions	5
Azure Resources	1.6
Azure Roles	1.4
Azure Service Principals	1.5
Azure Tenants	2.8
Azure Users	3.4
Azure Virtual Machines	2.5

Disk Space for Active Roles Event Data

An index entry for a single Active Roles event in IT Security Search Warehouse takes 0.5KB on average. Estimate the event rate in your environment to calculate the required disk space.

Disk Space for InTrust and Change Auditor Data

To display InTrust and Change Auditor events, IT Security Search uses the built-in indexes in InTrust and Change Auditor data stores, so no additional disk space is required.

Where to Install

It is recommended that you install IT Security Search in the same domain as the servers of your data-providing systems: InTrust, Enterprise Reporter, Change Auditor, Recovery Manager for Active Directory and Active Roles. Do not install IT Security Search on any of those systems' servers.

Product licensing

This product does not require licensing.

Upgrade and installation instructions

IT Security Search 11.4.1 Update 2 can be installed only on top of version 11.4.1 with or without Update 1. Do one of the following:

- If you don't have IT Security Search on your computer, first install IT Security Search 11.4.1 by running **ITSearchSuite.exe**. Then take the steps from **To apply Update 2** below.
- If your IT Security Search version is older than 11.4.1, upgrade it to version 11.4.1 by running **ITSearchSuite.exe**. Then take the steps from **To apply Update 2** below.
- If you have IT Security Search 11.4.1 with or without Update 1, take the steps from **To apply Update 2** below.

CAUTION: When you specify the organization and configuration database for the Warehouse component during installation of a new instance of IT Security Search, do not select an existing InTrust or Warehouse organization or configuration database. If you do, that database can become corrupted. Always create a new organization and configuration database for each instance.

To apply Update 2

1. Run **ITSearch_Update2_11.4.1.17592.exe**. It is a self-extracting archive which contains the following files:
 - ITSearchWH.msi
 - ITSearch.msi
2. Run **ITSearchWH.msi** to update IT Security Search Warehouse.
3. Run **ITSearch.msi** to update IT Security Search.

For more details, see [Installing IT Security Search](#).

More resources

Additional information is available from [online product documentation](#).

Globalization

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.

We are more than just a name

We are on a quest to make your information technology work harder for you. That is why we build community-driven software solutions that help you spend less time on IT administration and more time on business innovation. We help you modernize your data center, get you to the cloud quicker and provide the expertise, security and accessibility you need to grow your data-driven business. Combined with Quest's invitation to the global community to be a part of its innovation, and our firm commitment to ensuring customer satisfaction, we continue to deliver solutions that have a real impact on our customers today and leave a legacy we are proud of. We are challenging the status quo by transforming into a new software company. And as your partner, we work tirelessly to make sure your information technology is designed for you and by you. This is our mission, and we are in this together. Welcome to a new Quest. You are invited to Join the Innovation™.

Our brand, our vision. Together.

Our logo reflects our story: innovation, community and support. An important part of this story begins with the letter Q. It is a perfect circle, representing our commitment to technological precision and strength. The space in the Q itself symbolizes our need to add the missing piece — you — to the community, to the new Quest.

Contacting Quest

For sales or other inquiries, visit www.quest.com/contact.

Technical support resources

Technical support is available to Quest customers with a valid maintenance contract and customers who have trial versions. You can access the Quest Support Portal at <https://support.quest.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
- Engage in community discussions
- Chat with support engineers online
- View services to assist you with your product

Third-party contributions

This product contains the following third-party components. For third-party license information, go to <http://www.quest.com/legal/license-agreements.aspx>. Source code for components marked with an asterisk (*) is available at <https://opensource.quest.com>.

Table 8: List of Third-Party Contributions

Component	License and/or Acknowledgement
Angular.js 1.5.3	MIT Copyright (c) 2010-2017 Google, Inc. http://angularjs.org
angular-file-upload 1.1.5	MIT Copyright (c) 2013 nerv. https://github.com/nervgh
angular-timer 1.1.9	MIT Copyright (c) 2013 Siddique Hameed
angular-translate 2.8.1	MIT Copyright (c) 2015 The angular-translate team, Pascal Precht
angular-ui-bootstrap 2.5.0	MIT Copyright (c) 2012-2017 the AngularUI Team, https://github.com/organizations/angular-ui/teams/291112
angular-ui-utils 0.0.3	MIT Copyright (c) 2015 the AngularUI Team, http://angular-ui.github.com
Bootstrap 3.1.1	MIT Copyright (c) 2011-2016 Twitter, Inc. Apache 2.0 Copyright 2002-2014 The Apache Software Foundation
Castle.Core 4.3.1	Apache 2.0 Copyright 2004-2018 Castle Project - http://www.castleproject.org/
CommandLineParser 2.3.0	MIT Copyright (c) 2005 - 2018 Giacomo Stelluti Scala & Contributors
Community MSI Extensions 1.4*	Eclipse Public License 1.0 Copyright (c) Application Security Inc. and Contributors The source code for this component is available at https://opensource.quest.com/releases/WixUserPrivilegesExtension.zip

Component	License and/or Acknowledgement
CsQuery 1.3.4	MIT Copyright (c) 2012 James Treworgy
CsvHelper 7.1.1	Dual licensing under Microsoft Public License (MS-PL) and Apache 2.0 Copyright 2009-2017 Josh Close and Contributors
daterangepicker 2.1.25	MIT Copyright (c) 2012-2017 Dan Grossman
DotNetZip 1.13.3	DotNetZip 1.13.3 Copyright (c) 2006 - 2011 Dino Chiesa Copyright (c) 2006, 2007, 2008, 2009 Dino Chiesa and Microsoft Corporation. Copyright (c) 2000,2001,2002,2003 ymnk, JCraft, Inc. Copyright (C) 1995-2004 Jean-loup Gailly and Mark Adler Copyright 2002-2014 The Apache Software Foundation
ElasticSearch 2.4.4	Apache 2.0 Copyright 2009-2015 Elasticsearch This product includes software developed by The Apache Software Foundation (http://www.apache.org/). License is here: https://github.com/elasticsearch/elasticsearch/blob/master/LICENSE.txt
Elasticsearch.Net 2.5.8	Apache 2.0 Copyright (c) 2014-2018 by Elasticsearch BV
Google Open Sans 1.10	Apache 2.0 Digitized data copyright © 2010-2011, Google Corporation.
HighCharts 3.0.4	Highsoft Solutions AS OEM License Agreement 2.0 (c) 2009-2013 Torstein Hønsi
JRE 8	© 1995, 1996, Sun Microsystems, Inc. All rights reserved. 2550 Garcia Avenue, Mountain View, California 94043-1100 U.S.A.
JetBrains.Annotations 2018.2.1	MIT Copyright (c) 2016 JetBrains http://www.jetbrains.com
jQuery 3.3.1	MIT Copyright 2018 The jQuery Foundation
jquery.fileDownload 1.4.5	MIT Copyright (c) 2014 John Culviner

Component	License and/or Acknowledgement
Kendo UI Web 2014.3.1316	Kendo UI Web Copyright 2013 Telerik AD. All rights reserved.
keycloak-js-bower 3.2	Apache 2.0 Copyright 2017 Red Hat
Linq2Rest 4.1.0	Microsoft Public License (Ms-PL) 1.0 Copyright © Reimers.dk 2014
Log4Net 2.0.8	Apache 2.0 Copyright 2004-2017 The Apache Software Foundation
Lucene.Net 3.0.3	Apache 2.0 Copyright 2013 The Apache Software Foundation
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