



System Requirements and Architecture Guide

7.1.1 Release

Copyright © 2022 OneStream Software LLC. All rights reserved.

Any warranty with respect to the software or its functionality will be expressly given in the Subscription License Agreement or Software License and Services Agreement between OneStream and the warrantee. This document does not itself constitute a representation or warranty with respect to the software or any related matter.

OneStream Software, OneStream, Extensible Dimensionality and the OneStream logo are trademarks of OneStream Software LLC in the United States and other countries. Microsoft, Microsoft Azure, Microsoft Office, Windows, Windows Server, Excel, .NET Framework, Internet Explorer, Internet Information Server, Windows Communication Foundation and SQL Server are registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. DevExpress is a registered trademark of Developer Express, Inc. Cisco is a registered trademark of Cisco Systems, Inc. Intel is a trademark of Intel Corporation. AMD64 is a trademark of Advanced Micro Devices, Inc. Other names may be trademarks of their respective owners.

Table of Contents

Introduction	1
Technology Summary	2
Technology Overview	2
Architecture	2
Web Client Overview	4
OneStream Windows App	4
OneStream Mobile	4
OneStream Excel Add-in	4
OneStream	4
Web Server Overview	5
Application Server Overview	5
Database Server Overview	6
Deployment Environment	7
Application Folder Permissions	8
Hardware and Software Requirements	9
Minimum Environment Requirements	12
Minimum Development System Infrastructure Requirements	12
Small Environment Size Estimate (1 – 75 Concurrent Users)	13
Medium Environment Size Estimate (75 - 150 Concurrent Users)	13

Table of Contents

Large Environment Size Estimate (150 - 225 Concurrent Users) ... 14

Enterprise Environment Size Estimate (225+ Concurrent Users) .. 15

System Infrastructure Guidelines 16

 Database Configuration Requirements 16

 IIS Configuration Requirements 16

 Network Configuration Requirements 17

 Virtualized Environments 17

Third-Party Component Technology 19

 Client 19

Introduction

The purpose of this document is to provide an overview of OneStream's architecture and system requirements while giving guidance in choosing the proper deployment environment for a given user base. The anticipated audience is both those in Finance and Information Technology who make decisions on financial application deployment, desired functionality, security and support.

NOTE: While some concepts in this document apply to any OneStream deployment, this document focuses on customers who choose to implement OneStream **on premise**. For a list of the hardware and software components for each customer's OneStream Cloud Service on Microsoft Azure, see the *Cloud Architecture and Managed Services* document.

OneStream supports a Rich Internet Application (RIA) that utilizes a Service-Oriented Architecture. It is architected in such a way to be highly scalable to support thousands of users. Engineered from the ground up as a native 64-bit application, OneStream allows you to take advantage of true 64-bit technology, including performance benefits, broader scalability, and a lower cost of ownership. At the heart of OneStream is a powerful in-memory, 64-bit financial analytic engine with sophisticated algorithms and caching technology that reduces database traffic and provides for an extremely flexible multi-dimensional model with enhanced calculation capabilities.

The *Installation and Configuration Guide* and other documentation can be downloaded from MarketPlace.

Technology Summary

The following provides an overview of the major technology components involved in an on-premise OneStream deployment.

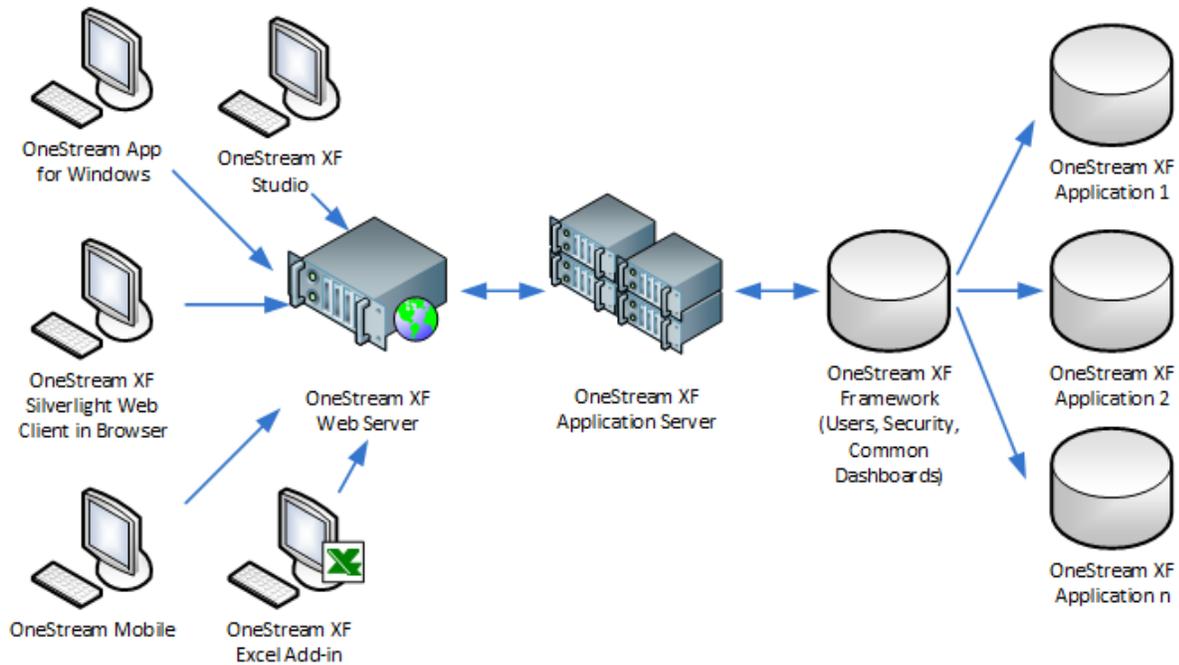
Technology Overview

OneStream is a Microsoft .NET application that incorporates major components of a Corporate Performance Management (CPM) system including Data Quality, Financial Consolidation, Budgeting, Planning, Forecasting, Modeling, Reporting and Analysis. The user interface features RIA web-based technologies to provide a browser-based and finance-focused experience that does not require custom deployment or manual installation by end users. OneStream also provides a sophisticated Microsoft Office add-in that integrates data and workflow activities in Excel for additional analysis.

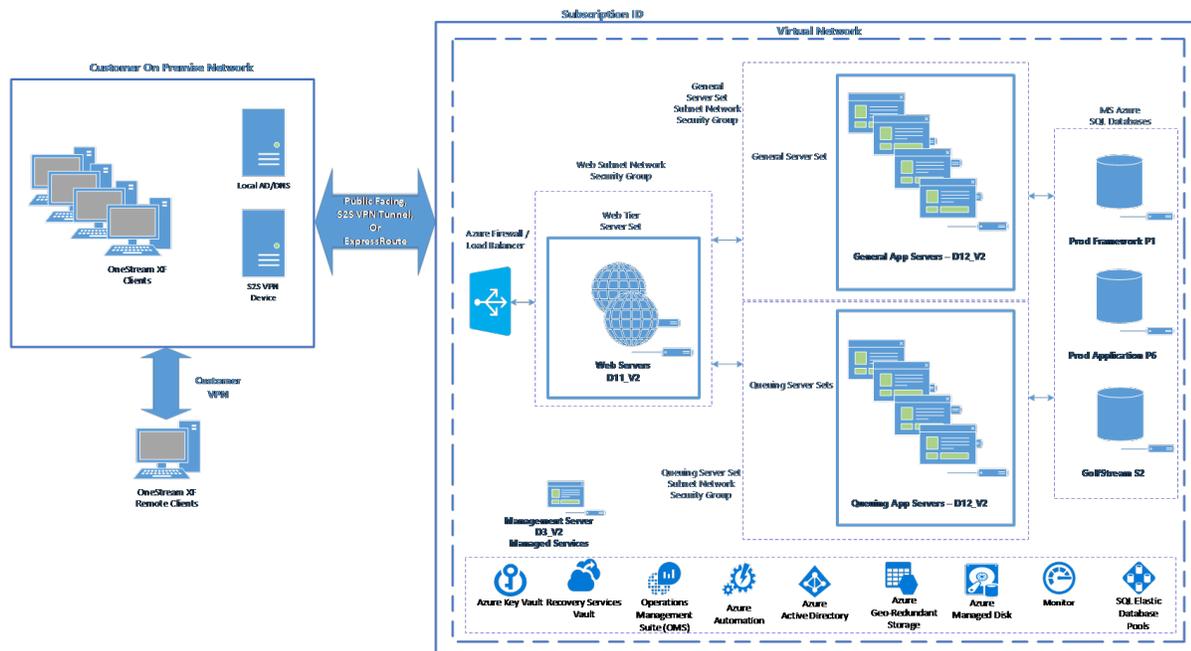
Architecture

OneStream's architecture is built for the enterprise. It supports fault tolerance and unlimited scalability with its inherent ability to support multiple web servers and application servers using a stateless 64-bit architecture. This is an example of a standard customer deployment:

Technology Summary



This is an example of a customer deployment on a private Azure subscription:



Web Client Overview

OneStream Windows App

OneStream Windows App is a browserless web application. OneStream Windows App provides a Spreadsheet feature with the potential to eliminate the need for an Excel Add-in which requires administrative rights to install on a user's desktop. It uses all firewall-friendly communications to OneStream web servers using Microsoft Windows Communication Foundation (WCF) technology. All client to server connectivity is based on SOAP and REST web services over HTTP/HTTPS. This is safely deployed with a signed SSL certificate. Microsoft ClickOnce technology is provided for true web-based deployment ease and is supported on all versions of Windows which are currently under mainstream support by Microsoft.

OneStream Mobile

OneStream offers a mobile user interface alternative (HTML5-based) via a separate URL accessible by most web browsers, including mobile browsers. Its main functions include data analysis consumption of rich reporting content and monitoring capabilities for administrators. Users simply go to a standard website deployed via OneStream on their desktop or mobile browser. Mobile users would either access a public facing OneStream mobile instance or employ a mobile-based VPN solution. No native mobile app is required.

OneStream Excel Add-in

The OneStream Excel Add-In client should be installed for any user that will need the ability to perform Excel-based analysis on OneStream financial model data. The OneStream Excel Add-In is an Excel COM add-in that securely connects to the OneStream servers through the OneStream web services.

OneStream

The OneStream client is recommended for users that need to create specialized report layouts. OneStream is a Windows client that securely connects to the OneStream servers through the OneStream web services.

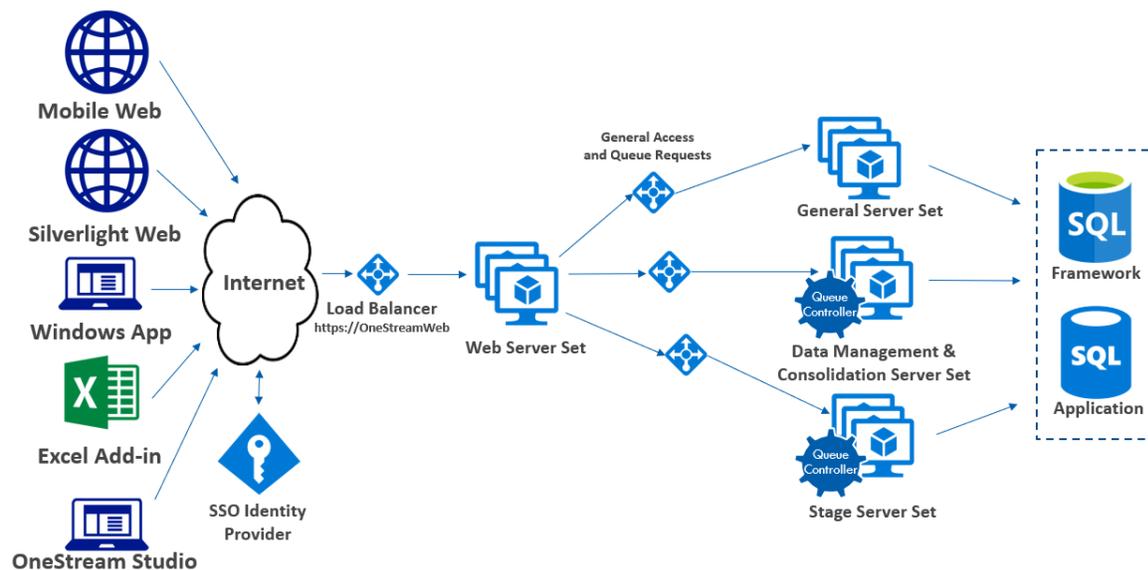
Web Server Overview

OneStream supports multiple web servers running in Microsoft Internet Information Services (IIS) to provide fault tolerance and scalability. The web server(s) are accessed by end users' Excel clients using Windows Communication Foundation (WCF) Web Services technologies. All WCF communications between the client and web servers utilize firewall friendly and secure HTTPS/SOAP protocols. After a request is received, the web servers forward the information to one or more application servers. Then they process the data for efficient transfer over the internet and return the resulting information to the client. The interaction between OneStream's clients and web servers is purposely designed to minimize internet traffic while providing a rich user experience. Since the software is built as a stateless architecture, access via the internet can be distributed to multiple web servers using a standard load balancing appliance (e.g., Cisco).

Application Server Overview

OneStream supports multiple application servers running in Microsoft IIS. The application servers represent the heart of the system and are designed for high scale processing and many concurrent requests. They are accessed via the web servers over a local area network (LAN) using WCF technology. The application servers can be configured for optimal communications performance using TCP/IP transport protocols or they can be configured for firewall friendly interaction with the web servers via a DMZ using HTTP(S) protocols. Since a broad range of capabilities is offered that require varying processing requirements, application servers can optionally be segregated according to the type of processing request. Specifically, each application server can be configured to support processor intensive consolidations, data intensive integration, and/or general transactions for end-user navigation.

The web servers utilize a proprietary load balancing algorithm to direct client requests to the appropriate application servers. For larger tasks such as data loads via OneStream's Stage, Consolidation and Data Management Sequences, the application servers utilize queuing and smart load balancing to run that task on the appropriate application server. For these types of server tasks, the request is written to a queue in the common Framework database. To prevent overloading certain application servers while others are idle, these types of servers regularly will check the queue as well as check the status of peer servers before accepting a task. The result is that the most capable server will pull this task from the queue to execute it. See *Data Management & Consolidation Server Set* and *Stage Server Set* in the diagram below. For assigning more general tasks to be executed, such as visualizing data via Cube Views, the web servers utilize a proprietary approach. See *General Server Set* in the diagram below.



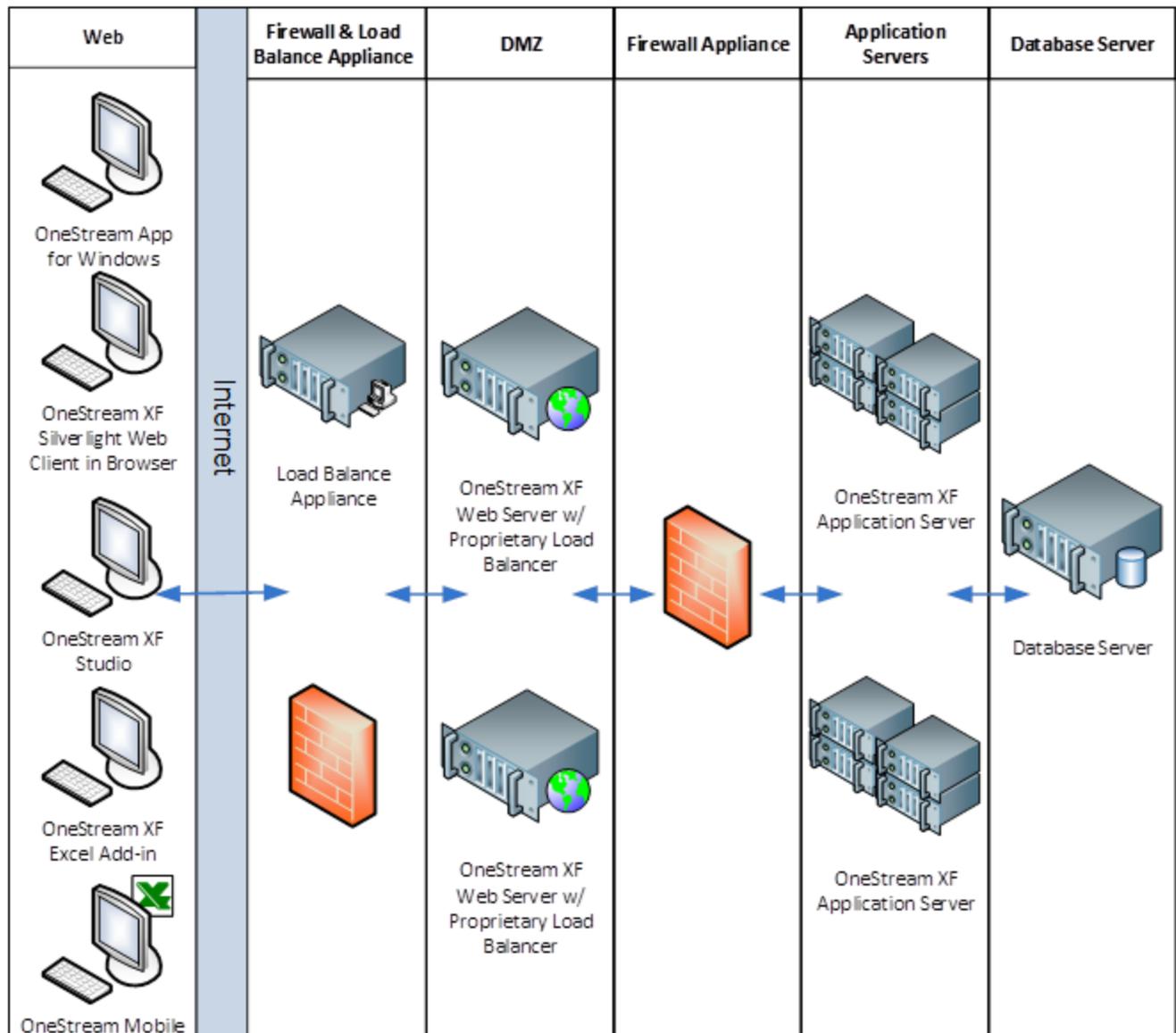
Database Server Overview

OneStream utilizes Microsoft SQL Server for all data storage. There are separate databases for each OneStream application and one Framework database containing shared metadata such as security, reports, logs, and other artifacts for use by all applications. OneStream supports SQL Server Standard Edition, however, to ensure expected performance, it is required for customers of any reasonable size to utilize a SQL Server version that supports Table Partitioning, such as Enterprise, Azure or SQL Server Standard version 2016 SP1 or higher. The “State” database is created automatically by the reporting engine. Since all application data and metadata are stored in a relational database, backup and recovery is accomplished using standard database administration functionality. The State database does not need to be backed up, as it will recreate itself if absent. All critical data required for financial and audit purposes are stored in the application databases.

Deployment Environment

OneStream's web based, N-tier architecture allows for unlimited users in a secure DMZ environment. A common configuration includes a load balancer appliance (e.g. F5 Load Balancer), one or more web servers, one or more applications servers and one database server. Specific CPU-intensive processes such as consolidation can be restricted to specific application servers to distribute or concentrate loads as desired. Accommodating additional users can be achieved by adding more web servers or application servers. Recommended server load is indicated in the Hardware and Software Requirements later in this document.

Deployment Environment



Application Folder Permissions

The OneStream application folder structure is used to store user logs and acts as the Application Server's workspace. The Application Server identity specified in the OneStream Configuration Tool requires full access to this folder structure, wherever it may reside.

Hardware and Software Requirements

The tables below identify the hardware and software required for each OneStream component. Suggested server load is also indicated.

Server configurations are intended to provide guidance only since actual production requirements may vary based on system use (number of dimensions, number of dimension members, number of concurrent users and so on). The versions listed below are recommended, given testing. Other versions may work but may not have been comprehensively tested.

Web Server Recommendations	
Supported Operating Systems	<ul style="list-style-type: none">• Windows Server 2019 (Recommended)• Windows Server 2012 R2
Recommended Hardware	<ul style="list-style-type: none">• 2 x64 Intel or AMD64 processors*• 8 GB RAM
Hard Disk Space	<ul style="list-style-type: none">• 60 GB
Required Software	<ul style="list-style-type: none">• Internet Information Server (IIS) 7.0 or higher• Windows Process Activation Service (WAS)• Microsoft .NET Framework 4.8
Recommended Network	<ul style="list-style-type: none">• 10 Gbps between all OneStream Servers

Application Server Recommendations	
Supported Operating Systems	<ul style="list-style-type: none">• Windows Server 2019 (Recommended)• Windows Server 2012 R2
Recommended Hardware	<ul style="list-style-type: none">• 8 or more x64 Intel or AMD64 processors*

Hardware and Software Requirements

Application Server Recommendations	
	<ul style="list-style-type: none"> • 32 GB RAM or higher
Hard Disk Space	<ul style="list-style-type: none"> • 60 GB
Required Software	<ul style="list-style-type: none"> • Internet Information Server (IIS) 7.0 or higher • Windows Process Activation Service (WAS) • Microsoft .NET Framework 4.8
Recommended Network	<ul style="list-style-type: none"> • 10 Gbps between all OneStream Servers

Data Server Recommendations	
Supported Operating Systems	<ul style="list-style-type: none"> • Windows Server 2016 (Recommended) • Windows Server 2012 R2
Recommended Hardware	<ul style="list-style-type: none"> • 8 x64 Intel or AMD64 processors* • 128 GB RAM
Hard Disk Space	<ul style="list-style-type: none"> • 1 TB - Depends on size of OneStream application
Required Software	<ul style="list-style-type: none"> • SQL Server SQL Server 2012 is end of Life in July 2022 and should be removed 2014, 2016 or 2017, 2019 Enterprise Edition (Recommended) <ul style="list-style-type: none"> ◦ Required for larger, more complicated deployments (i.e. 50+ users, complex consolidation and calculations) • SQL Server ,SQL Server 2012 is end of Life in July 2022 and should be removed 2014, 2016 or 2017, 2019 Standard Edition <ul style="list-style-type: none"> ◦ Acceptable for smaller, more simple deployments • SQL Server 2014 or Higher <ul style="list-style-type: none"> ◦ Required for BI Blend
Recommended Network	<ul style="list-style-type: none"> • 10 Gbps between all OneStream Servers

Hardware and Software Requirements

Client Workstation Recommendations	
Supported Operating Systems	<ul style="list-style-type: none">• Windows 8• Windows 10
Recommended Hardware	<ul style="list-style-type: none">• Exceed the minimum requirements for Operating System, and browser.• 64-bit Architecture• 8 GB RAM or higher
Required Software	<ul style="list-style-type: none">• Microsoft Office 2013 64-bit Office 2010 is End of Life as of October 13 2020, this should be removed and list 2013 minimum, although this is also end of life next year version or above (for optional Excel Add-in)• Microsoft .NET Framework 4.8• Microsoft Edge WebView2 Runtime Control (for features that embed external web content inside the OneStream Desktop application)
Recommended Software	<ul style="list-style-type: none">• 64-bit Windows OS• 64-bit Microsoft Office Excel version 2010 or higher (for optional Excel Add-in)

Note:

- OneStream and MarketPlace solutions often display multiple data elements. For optimal rendering, set screen resolution to a minimum of 1920 x 1080.
- Titanium processors are not supported for OneStream servers.
- OneStream may still work on Microsoft applications that have been ended, but our official support must follow Microsoft's mainstream support.

Minimum Environment Requirements

OneStream will provide guidelines and suggestions for your environment's minimum configuration, which is customized based on your anticipated use and complexity. The following requirements represent a minimum for most environments of an approximate size.

Minimum Development System Infrastructure Requirements

Virtual Machine - Guest Servers							
Quantity	Virtual Machine Guest Configuration	Processing Responsibilities	Logical CPUs (Processing)	Logical CPUs (Total)	Memory (GB)	Memory (Total)	Storage (GB)
1	VM Guest - Web & Application Server	User Web Requests, General, Stage/Reporting, Consolidation	8	8	32	32	60
1	VM Guest - Database Server	Database	8	8	32	32	500

NOTE: Many customers use their production or existing SQL Server instance as a place for the development database(s) to reside instead of dedicating a separate SQL Server just for OneStream development.

Basic configuration providing balanced performance for both user workloads and standard analytic processing. OneStream Software may recommend changes to this configuration based on customer application design and technical infrastructure.

As OneStream is horizontally hardware scalable, a generalized way to approach application server hardware sizing is that for approximately every 75 concurrent users, 2 General/Stage servers and 1 Consolidation server are required. This recommendation will vary from customer to customer depending on the type of concurrent usage. These are meant to be general guidelines and are historically accurate environment starting points. Each customer environment and usage pattern should still be evaluated against these recommendations with the OneStream infrastructure group. We are confident in the environmental recommendations, but they are not absolute and may change based on customer usage.

Small Environment Size Estimate (1 – 75 Concurrent Users)

Minimum Production System Infrastructure Requirements - Small Environment Size Estimate

Standard Configuration - Concurrent User Count (1 - 75)

Basic configuration providing balanced performance for both user workloads and standard analytic processing.

* OneStream Software may recommend changes to this configuration based on customer application design and technical infrastructure.

As OneStream is horizontally hardware scalable, a generalized way to approach application server hardware sizing is that for approximately every 75 concurrent users, 2 General/Stage servers and 1 Consolidation server are required. This recommendation will vary from customer to customer depending on the type of concurrent usage. These are meant to be general guidelines and are historically accurate environment starting points. Each customer environment and usage pattern should still be evaluated against these recommendations with the OneStream infrastructure group. We are confident in the environmental recommendations but they are not absolute and may change based on customer usage.

Virtual Machine - Guest Servers								
Quantity	Virtual Machine Guest Configuration	Processing Responsibilities	Logical CPUs (Processing)	Logical CPUs (Total)	Memory (GB)	Memory (Total)	Storage (GB)	Storage (Total)
1	VM Guest - Web Server	User Web Requests	2	2	8	8	60	60
1	VM Guest - Application Server	General	8	8	32	32	60	60
1	VM Guest - Application Server	Stage/Reporting	8	8	32	32	60	60
1	VM Guest - Application Server	Consolidations	8	8	32	32	60	60
1	VM Guest - Database Server	SQL Database Server	8	8	128	128	1000	1000

Fileshare					
Quantity	Machine Configuration	Fileshare Usage	Processing	Memory	Storage
1	Fileshare	Temporary Workspace For Application Server Processing Batch File Processing / Data Extracts	N/A	N/A	10 - 20 GB

Medium Environment Size Estimate (75 - 150 Concurrent Users)

Minimum Production System Infrastructure Requirements - Medium Environment Size Estimate

Standard Configuration - Concurrent User Count (75 - 150)

Basic configuration providing balanced performance for both user workloads and standard analytic processing.

* OneStream Software may recommend changes to this configuration based on customer application design and technical infrastructure.

As OneStream is horizontally hardware scalable, a generalized way to approach application server hardware sizing is that for approximately every 75 concurrent users, 2 General/Stage servers and 1 Consolidation server are required. This recommendation will vary from customer to customer depending on the type of concurrent usage. These are meant to be general guidelines and are historically accurate environment starting points. Each customer environment and usage pattern should still be evaluated against these recommendations with the OneStream infrastructure group. We are confident in the environmental recommendations but they are not absolute and may change based on customer usage.

Minimum Environment Requirements

Virtual Machine - Guest Servers								
Quantity	Virtual Machine Guest Configuration	Processing Responsibilities	Logical CPUs (Processing)	Logical CPUs (Total)	Memory (GB)	Memory (Total)	Storage (GB)	Storage (Total)
2	VM Guest - Web Server	User Web Requests	2	4	8	16	60	120
2	VM Guest - Application Server	General	8	16	32	64	60	120
2	VM Guest - Application Server	Stage/Reporting	8	16	32	64	60	120
2	VM Guest - Application Server	Consolidations	12	24	32	64	60	120
1	VM Guest - Database Server	SQL Database Server	8	8	256	256	1000	1000

Fileshare					
Quantity	Machine Configuration	Fileshare Usage	Processing	Memory	Storage
1	Fileshare	Temporary Workspace For Application Server Processing Batch File Processing / Data Extracts	N/A	N/A	20 - 30 GB

Large Environment Size Estimate (150 - 225 Concurrent Users)

Minimum Production System Infrastructure Requirements - Large Environment Size Estimate

Standard Configuration - Concurrent User Count (150 - 225)

Basic configuration providing balanced performance for both user workloads and standard analytic processing.

** OneStream Software may recommend changes to this configuration based on customer application design and technical infrastructure.*

As OneStream is horizontally hardware scalable, a generalized way to approach application server hardware sizing is that for approximately every 75 concurrent users, 2 General/Stage servers and 1 Consolidation server are required. This recommendation will vary from customer to customer depending on the type of concurrent usage. These are meant to be general guidelines and are historically accurate environment starting points. Each customer environment and usage pattern should still be evaluated against these recommendations with the OneStream infrastructure group. We are confident in the environmental recommendations but they are not absolute and may change based on customer usage.

Virtual Machine - Guest Servers								
Quantity	Virtual Machine Guest Configuration	Processing Responsibilities	Logical CPUs (Processing)	Logical CPUs (Total)	Memory (GB)	Memory (Total)	Storage (GB)	Storage (Total)
3	VM Guest - Web Server	User Web Requests	2	6	8	24	60	180
3	VM Guest - Application Server	General	8	24	32	96	60	180
3	VM Guest - Application Server	Stage/Reporting	8	24	32	96	60	180
3	VM Guest - Application Server	Consolidations	12	36	32	96	60	180
1	VM Guest - Database Server	SQL Database Server	16	16	512	512	1000	1000

Fileshare					
Quantity	Machine Configuration	Fileshare Usage	Processing	Memory	Storage
1	Fileshare	Temporary Workspace For Application Server Processing Batch File Processing / Data Extracts	N/A	N/A	20 - 30 GB

Minimum Environment Requirements

Enterprise Environment Size Estimate (225+ Concurrent Users)

Minimum Production System Infrastructure Requirements - Enterprise Environment Size Estimate

Standard Configuration - Concurrent User Count (225+)

Basic configuration providing balanced performance for both user workloads and standard analytic processing.

* OneStream Software may recommend changes to this configuration based on customer application design and technical infrastructure.

As OneStream is horizontally hardware scalable, a generalized way to approach application server hardware sizing is that for approximately every 75 concurrent users, 2 General/Stage servers and 1 Consolidation server are required. This recommendation will vary from customer to customer depending on the type of concurrent usage. These are meant to be general guidelines and are historically accurate environment starting points. Each customer environment and usage pattern should still be evaluated against these recommendations with the OneStream infrastructure group. We are confident in the environmental recommendations but they are not absolute and may change based on customer usage.

Virtual Machine - Guest Servers								
Quantity	Virtual Machine Guest Configuration	Processing Responsibilities	Logical CPUs (Processing)	Logical CPUs (Total)	Memory (GB)	Memory (Total)	Storage (GB)	Storage (Total)
4	VM Guest - Web Server	User Web Requests	2	8	8	32	60	240
4	VM Guest - Application Server	General	8	32	32	128	60	240
4	VM Guest - Application Server	Stage/Reporting	8	32	32	128	60	240
4	VM Guest - Application Server	Consolidations	12	48	32	128	60	240

* Note - For concurrency levels greater than 225 the number of VM Hosts & Guests will be multiples of the recommendations above.

Physical Machine - Database Server					
Quantity	Machine Configuration	Processing Responsibilities	Processing	Memory	Storage
1	Database Server	SQL Server	32 Logical CPUs	512 GB - 1 TB	1 TB

Fileshare					
Quantity	Machine Configuration	Fileshare Usage	Processing	Memory	Storage
1	Fileshare	Temporary Workspace For Application Server Processing Batch File Processing / Data Extracts	N/A	N/A	30 - 40 GB

System Infrastructure Guidelines

Basic configuration providing balanced performance for both user workloads and standard analytic processing.

NOTE: OneStream Software may recommend changes to this configuration based on customer application design and technical infrastructure.

As OneStream is horizontally hardware scalable, a generalized way to approach application server hardware sizing is that for approximately every 75 concurrent users, 2 General/Stage servers and 1 Consolidation server are required. This recommendation will vary from customer to customer depending on the type of concurrent usage. These are meant to be general guidelines and are historically accurate environment starting points. Each customer environment and usage pattern should still be evaluated against these recommendations with the OneStream infrastructure group. We are confident in the environmental recommendations, but they are not absolute and may change based on customer usage.

Database Configuration Requirements

- Transaction logs and data at a minimum should be stored on separate drives to spread I/O across drives. For more advanced configurations and improved throughput, create additional File Groups to spread I/O across devices.
- Scheduled SQL Server Maintenance Plan: Back up of the database and transaction log files. Re-Index: Reorganizes the data on the data and index pages by rebuilding indexes.

IIS Configuration Requirements

- No OneStream AppPool Timeout: All OneStream AppPool timeout and recycle settings should be set and remain at "0". IIS should never be triggered to recycle itself other than after the default period of inactivity.
- Ping Enabled "False": OneStream AppPool's settings should be set with "Ping Enabled" to False. Under times of high server resource utilization, IIS can potentially recycle itself if it does not receive and expected response because the server is too busy.

Network Configuration Requirements

- **App Server & DB Server On Same Segment:** OneStream Servers should all be located behind the same network switch and within close proximity to each other.
- **Consistent NIC Card Speed:** OneStream Servers should all have the same NIC card throughput speeds to prevent any backups or bottlenecks.
- **Load Balancer Appliance (No Retry):** Whether software or hardware load balancer, nothing should be attempting to manage timeout or retry requests on behalf of OneStream.

Virtualized Environments

Hardware virtualization software lets you run multiple operating systems and application instances at the same time on a single server. This provides significant flexibility and efficiencies in the use of a company's hardware resources. OneStream Software is virtualization optimized across all tiers of the environment; database, application and web.

- For optimal performance, OneStream recommends running the OneStream virtual guest servers on a dedicated host with completely dedicated CPU and RAM.
- OneStream recommends that OneStream virtual servers be housed on servers that only contain OneStream virtual servers and not those that house other applications. OneStream virtual servers and physical servers holding them should not be included within a shared or pooled virtual machine to ensure they receive the proper resources required.
- OneStream virtual machines should not be set to automatically move (live migration/VMotion) from one physical server to another except during maintenance or as the result of a server fault due to the inability of the host servers to keep up with the active in-memory object synchronization across the network. If the corporate network and/or infrastructure cannot keep up with the synchronization of the server objects in memory during a live migration under heavy processing or if a live migration causes the server to pause, a failed application process will result.
- Over committing or over subscribing of the CPUs will cause significant performance impact. Due to the highly multithreaded nature of the application architecture and depending on the process, significant performance impacts will be observed during processes like data loading, calculations or consolidations if over committing is employed.

System Infrastructure Guidelines

- Dynamic memory management by the VM Host is not recommended. RAM usage can escalate extremely quickly and if the VM guest does not have the committed RAM immediately available then significant performance impacts will be observed.
- Consolidations and certain calculations can significantly tax the I/O demands of the data server, applying contentious demands to what is ultimately one virtual file, in a virtualized data server environment. If virtual environments are used, application and data servers must be configured with adequate RAM and CPU cores.
- OneStream does not test or support our software running together with non-OneStream applications running in the same virtual environment. It is therefore recommended that software running in a virtual machine be limited to OneStream applications and other resources required to support our application environment.

Third-Party Component Technology

OneStream is constructed using both proprietary and third-party tools in the authoring, installation and running of our supported products. See *Hardware and Software Requirements* for supported version information.

Client

Third-party developer components include Developer Express (aka DevExpress; for user interface controls and reporting), Telerik (User Interface controls), and ActiPro Software (Syntax Editor). OneStream customers are not required to purchase these developer tools.

OneStream Windows App

Rich Internet Application developed using Microsoft Windows Presentation Foundation (WPF) technologies. Third-party developer components include DevExpress (for user interface controls and reporting), Telerik (User Interface controls), and ActiPro Software (Syntax Editor). OneStream customers are not required to purchase these developer tools.

Other Windows Clients

OneStream Server Configuration Utility and OneStream Database Configuration Utility are used for initial setup and updates. Both are developed using Microsoft .NET technologies. OneStream customers are not required to purchase these developer tools.

Microsoft Office

OneStream Excel Add-in (optional) is developed using Microsoft .NET technologies. In order to use the optional OneStream Excel Add-in, OneStream customers must have the Excel component of a supported version of Microsoft Office and be up to date with the required version of .NET Framework.

OneStream Code

Developer Express compression libraries are used to implement data compression for reducing network traffic. It is also used to create Zip files when extracting an entire application.

Web Server

Developed using Microsoft Internet Information Services (IIS) and the Microsoft .NET Framework.

Third-Party Component Technology

Mobile Web

Mobile interface developed using Microsoft MVC. This is a HTML5-based user interface for data consumption. Third-party developer components utilized include Bootstrap, jQuery and Newtonsoft.Json.

Application Server

Developed using Microsoft Internet Information Services (IIS) and Microsoft .NET Framework. For integration with SAP sources, Theobald ERPConnect45.dll libraries are made available during the OneStream Application Server installation.

Database Server

Microsoft SQL Server

Other Embedded Components

IdentityModel is utilized for OpenID Connect 2.0 and OAuth based authentication. RestSharp client is used for connecting to REST and HTTP authentication APIs.

In the security layer, Microsoft OWIN for the IApplicationBuilder startup interface is embedded.

For business rule compilation, the Microsoft .NET Compiler Platform (“Roslyn”) is utilized.

Installation Tool

OneStream’s installation tool was developed using third-party software.

Supported Legacy Authentication Providers

- OneStream Native
- Microsoft Active Directory (MSAD)
- LDAP
- Azure AD
- Okta
- PingFederate
- SAML 2.0

Open Source Software

OneStream’s software is distributed with certain third-party software that is subject to the MIT License, the Apache 2.0 license, GPL License, or the 3-Clause BSD License. Following is a summary of such software, the licenses to which the software is subject, and the text of the applicable license.

MIT LICENSE

Bootstrap is distributed in connection with OneStream Mobile MVC HTML5 UI.

<https://github.com/twbs/bootstrap/blob/v4.0.0/LICENSE>

Copyright (c) 2011-2018 Twitter, Inc.

Copyright (c) 2011-2018 The Bootstrap Authors

JQuery is distributed in connection with OneStream Mobile MVC HTML5 UI.

<https://github.com/jquery/jquery/blob/master/LICENSE.txt>

Copyright JS Foundation and other contributors, <https://js.foundation/>

Newtonsoft.json is distributed in connection with OneStream Mobile MVC HTML5 UI.

<https://github.com/JamesNK/Newtonsoft.Json/blob/master/LICENSE.md>

Copyright (c) 2007 James Newton-King

The MIT License is reproduced below:

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

APACHE 2.0 LICENSE

IdentityModel (Security Layer: OpenID Connect 2.0 client helper libect & OAuth)

<https://github.com/IdentityModel/IdentityModel/blob/master/LICENSE>

Third-Party Component Technology

Microsoft.OWIN is distributed in connection with OWIN IApplicationBuilder startup interface.

<https://github.com/tomi85/Microsoft.Owin/blob/master/LICENSE.txt>

RestSharp is distributed in connection with authentication for REST and HTTP API client

<https://github.com/restsharp/RestSharp/blob/master/LICENSE.txt>

The Apache 2.0 License is reproduced below:

Apache License

Version 2.0, January 2004

<http://www.apache.org/licenses/>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

Third-Party Component Technology

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.

3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:

You must give any other recipients of the Work or Derivative Works a copy of this License; and

You must cause any modified files to carry prominent notices stating that You changed the files; and

Third-Party Component Technology

You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and

If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.

7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.

8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

GNU GENERAL PUBLIC LICENSE VERSION 2

LibreOffice Dictionaries is implemented in the OneStream client for spell checking.

<https://github.com/LibreOffice/dictionaries/blob/master/en/license.txt>

The GNU General Public License is reproduced below:

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

Copyright (C) 1989, 1991 Free Software Foundation, Inc.,

51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Lesser General Public License instead.) You can apply it to your programs, too.

Third-Party Component Technology

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you

distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

GNU GENERAL PUBLIC LICENSE

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".

Third-Party Component Technology

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.

b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.

c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

Third-Party Component Technology

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

Third-Party Component Technology

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

Third-Party Component Technology

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED

TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

3-Clause BSD License for NLog

The OneStream Platform relies on NLog software for writing single-sign-on (SSO) debugging logs for troubleshooting SSO connectivity issues.

The following information applies to NLog:

Copyright (c) 2004-2020 Jaroslaw Kowalski <jaak@jkwowski.net>, Kim Christensen, Julian Verdurmen

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. * Neither the name of Jaroslaw Kowalski nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission. THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

3-Clause BSD License for Anaconda

Predictive Analytics 123 (PAM) relies on Python code and Anaconda Distribution software for the environment to execute the code to run financial prediction models within the solution.

The following information applies to Anaconda Distribution:

© 2015, Anaconda, Inc.

All rights reserved under the 3-clause BSD License:

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

Third-Party Component Technology

Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

Neither the name of Anaconda, Inc. (“Anaconda, Inc.”) nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS “AS IS” AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL ANACONDA, INC. BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Notice of Third Party Software Licenses

Anaconda Distribution contains open source software packages from third parties. These are available on an “as is” basis and subject to their individual license agreements. These licenses are available in Anaconda Distribution or at <http://docs.anaconda.com/anaconda/pkg-docs>. Any binary packages of these third party tools you obtain via Anaconda Distribution are subject to their individual licenses as well as the Anaconda license. Anaconda, Inc. reserves the right to change which third party tools are provided in Anaconda Distribution.

In particular, Anaconda Distribution contains re-distributable, run-time, shared-library files from the Intel(TM) Math Kernel Library (“MKL binaries”). You are specifically authorized to use the MKL binaries with your installation of Anaconda Distribution. You are also authorized to redistribute the MKL binaries with Anaconda Distribution or in the conda package that contains them. Use and redistribution of the MKL binaries are subject to the licensing terms located at <https://software.intel.com/en-us/license/intel-simplified-software-license>. If needed, instructions for removing the MKL binaries after installation of Anaconda Distribution are available at <http://www.anaconda.com>.

Third-Party Component Technology

Anaconda Distribution also contains cuDNN software binaries from NVIDIA® Corporation (“cuDNN binaries”). You are specifically authorized to use the cuDNN binaries with your installation of Anaconda Distribution. You are also authorized to redistribute the cuDNN binaries with an Anaconda Distribution package that contains them. If needed, instructions for removing the cuDNN binaries after installation of Anaconda Distribution are available at <http://www.anaconda.com>.

Anaconda Distribution also contains Visual Studio Code software binaries from Microsoft Corporation (“VS Code”). You are specifically authorized to use VS Code with your installation of Anaconda Distribution. Use of VS Code is subject to the licensing terms located at <https://code.visualstudio.com/License>.

Cryptography Notice

This distribution includes cryptographic software. The country in which you currently reside may have restrictions on the import, possession, use, and/or re-export to another country, of encryption software. BEFORE using any encryption software, please check your country’s laws, regulations and policies concerning the import, possession, or use, and re-export of encryption software, to see if this is permitted. See the Wassenaar Arrangement <http://www.wassenaar.org/> for more information.

Anaconda, Inc. has self-classified this software as Export Commodity Control Number (ECCN) 5D992b, which includes mass market information security software using or performing cryptographic functions with asymmetric algorithms. No license is required for export of this software to non-embargoed countries. The Intel(TM) Math Kernel Library contained in Anaconda, Inc.’s software is classified by Intel(TM) as ECCN 5D992b with no license required for export to non-embargoed countries and Microsoft’s Visual Studio Code software is classified by Microsoft as ECCN 5D992.c with no license required for export to non-embargoed countries.

The following packages are included in this distribution that relate to cryptography:

- `openssl` The OpenSSL Project is a collaborative effort to develop a robust, commercial-grade, full-featured, and Open Source toolkit implementing the Transport Layer Security (TLS) and Secure Sockets Layer (SSL) protocols as well as a full strength general purpose cryptography library.
- `pycrypto` A collection of both secure hash functions (such as SHA256 and RIPEMD160), and various encryption algorithms (AES, DES, RSA, ElGamal, etc.).
- `pyopenssl` A thin Python wrapper around (a subset of) the OpenSSL library.

Third-Party Component Technology

- `kerberos` (krb5, non-Windows platforms) A network authentication protocol designed to provide strong authentication for client/server applications by using secret-key cryptography.
- `cryptography` A Python library which exposes cryptographic recipes and primitives.