Relativity®

System Requirements

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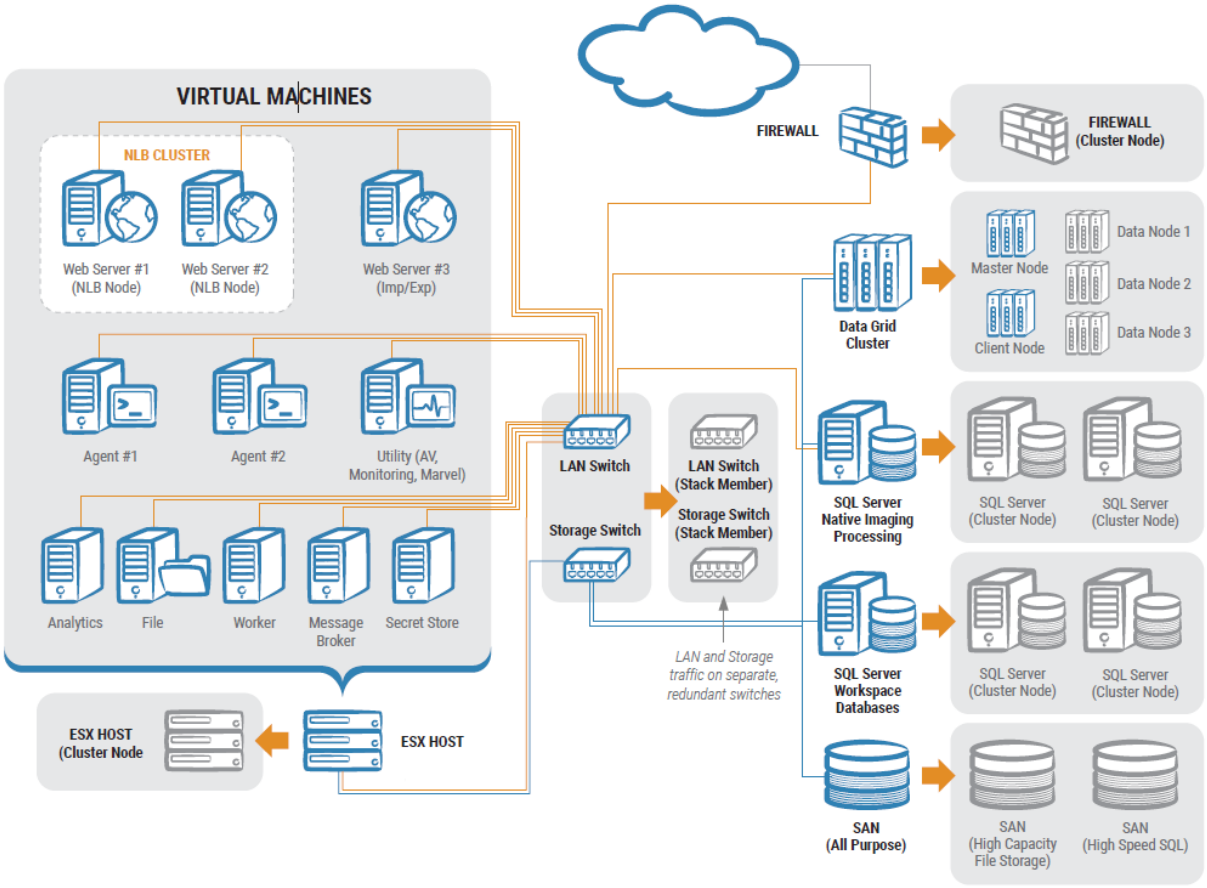
1 System requirements

These system requirements contain detailed information about the software and hardware you use to host Relativity in your environment and in the cloud. These requirements also provide various recommendations for configuring a new deployment of Relativity, as well as scaling your environment as the number of users and the amount of data continue to grow.

2 Infrastructure overview

Relativity is designed with a scalable infrastructure that you can tailor to the requirements of your environment. It is developed on the .NET framework with a Microsoft SQL Server back-end. As illustrated in the following diagram, all areas of the platform are scalable providing support for any hardware vendor, hypervisor, and storage protocol.



Web server

The Web Server is the gateway for all users to access Relativity. It authenticates the user with the system, contains APIs for searching and third-party applications, transfers documents to the end user in the Relativity Viewer, and is responsible for communications during imports and exports in workspaces. There are different mechanisms for authentication into the system including forms, active directory, two-factor, SAML 2.0, and OpenID Connect.. User sessions can be load balanced with the included Relativity User Load Balancer or via available hardware load balancing solutions.

Agent server (core)

Agents in Relativity are responsible for running all background processing tasks. When a user submits a job, such as a Production or OCR job, the associated agent(s) will pick up the job and complete the work. The agents run under a Windows Service and often require various levels of CPU, RAM and I/O, depending on the job type. The agents can be scaled vertically and horizontally to accommodate organizational needs.

Agent server (conversion)

In Relativity 9.6 and above, viewer conversion jobs are handled by the Conversion agents. Any Relativity agent server designated as a conversion agent server should only have one conversion agent deployed. Conversion jobs are multi-threaded and one conversion agent may utilize all available processor cores on a server.

For more information, see System requirements on page 4.

Agent server (dtSearch)

dtSearch queries are multi-threaded and spawn as many threads as there are sub-indexes or cores — whichever number is lowest will be the constraint. One dtSearch search agent may be able to utilize all available processor cores on a server. Therefore, each Relativity agent server that is designated to be a dtSearch search agent server should only have one dtSearch search agent and nothing else.

SQL Server (workspaces)

This SQL Server is where the structured text and metadata resides for the documents. Each Relativity workspace is represented by its own SQL Server database. Environments may have one or more SQL Servers. In addition to workspace databases there are Relativity system databases present on each server that contain tables for system configurations, agent job queues, users/groups, etc.

SQL Server (Invariant/Worker Manager server)

Relativity processing has individual store databases that correspond to each Relativity workspace database with processing enabled. Total memory and processor requirements for this role are not as demanding as the SQL Servers that house workspace databases. This server is also used for native imaging and save as PDF request management.

Worker

The 'Worker' role is responsible for handling enhanced native imaging and processing jobs. Relativity has placed a hard cap on the amount of threads that each Worker server is allowed to spawn, the hard cap is 16 threads. Each processor core and 2GB RAM will create two threads. Therefore, it is suggested that 8 logical cores and 16GB RAM be allocated to each worker server to get the most throughput.

Note: Refer to the Performance Baselines and Recommendations guide for a breakdown of performance metrics.

Secret Store

The Secret Store is a required component that provides secure, auditable storage for Relativity secrets. A secret could be user credentials, a database connect string, an instance setting that contains confidential information such as your SMTP credentials, or a TLS certificate. All confidential information is stored securely in the Secret Store database that can be accessed only from authenticated servers.

For more information, see The Relativity Secret Store Guide.

Message broker

The Relativity service bus is a message delivery service that communicates information about agent jobs to different application components. This infrastructure feature supports this communication by routing messages between application components. For example, Relativity uses the message broker for submitting conversion jobs to agents and returning converted documents.

Analytics

The analytics server is responsible for building and storing the conceptual indexes in the environment. Once an index is built, the server is also used to run the conceptual features such as categorization and clustering. In addition to conceptual indexing, structured analytics sets are run on this server for textual

analysis features such as email threading or language identification. The indexes and structured analytics sets are stored on disk in a configurable location.

File server

This server may not be required depending on the available storage. Relativity doesn't install any software on a file server for Relativity. Relativity just needs to know where the files (Natives/Images) live and the web servers need to be able to access those locations. The same applies to dtSearch, Analytics index, and viewer cache location(s).

Data Grid master node

This is the server within a cluster that manages changes across the entire cluster.

Data Grid client node

This is the server that serves as the gateway through which data enters a cluster. When there is more than one in an environment, these can be thought of as load balancers which service requests for data.

Data Grid data node

This is the server that stores data within a cluster.

3 Scalability

You can scale Relativity installations to handle the performance, storage, and other environmental factors necessary to support the addition of new users, continual growth of data, and increased demands for searching capabilities.

3.1 Tier level definitions

We have identified tier levels that support varying numbers of users and sizes of active data. You can use these tier level definitions to determine the cores, RAM, and other equipment required to support the rapid growth of your Relativity installation. Key terms used in the following table include:

- **Enabled User Accounts** – amount of enabled Relativity User accounts.
- **Simultaneous Users** - average amount of simultaneous users logged into Relativity.
- **Active SQL Data (TB)** - total amount of disk space consumed by SQL databases (mdf) and full text (ndf) indexes.
- **Active Record Count (MM)** – total amount of records (documents) included across all active Relativity workspaces.
- **Active File Size (TB)** - total amount of disk space consumed by native and image files.

This table identifies the combination of users, data, and file sizes associated with each tier.

	Tier 1 - Entry Level Environment	Tier 2 - Mid Level Environment	Tier 3 - Large Scale Environment
Enabled User Accounts	< 300	300 - 1000	1000+
Simultaneous Users	< 100	100 - 500	500+
Active SQL Data (TB)	< 1	1 - 10	10+
Active Record Count (MM)	< 20	20 - 100	100+
Active File Size (TB)	< 5	5 - 30	30+

The equipment used to support environments at each tier is described in the following table.

	Tier 1 - Entry Level Environment	Tier 2 - Mid Level Environment	Tier 3 - Large Scale Environment
Total Cores for Non-SQL	< 48	48 - 192	192+
Total Memory (GB) for Non-SQL	< 96	96 - 384	384+

	Tier 1 - Entry Level Environment	Tier 2 - Mid Level Environment	Tier 3 - Large Scale Environment
Total Cores for SQL Server	< 16	16 - 96	96+
Total Memory (GB) for SQL Server	< 128	128 - 1024	1024+
Total SQL Storage I/O (Gbps)	4 - 8	8+	16+
SQL Tempdb Storage	Separate spindles	SSD or flash	SSD or flash

Note: Microsoft SQL Server Fast Track combines pre-configured servers, storage, and networking with SQL Server 2012 R2 Enterprise for a scalable enterprise data warehouse platform. You can choose industry-standard hardware from Dell, HP, Cisco, IBM, EMC, and other leading vendors.

4 Required configurations for new deployments

Contact Client Services for assistance with designing your Relativity infrastructure.

Notes:

- The following Tier 1 example environments provide information for different user and data counts. Most new deployments adhere to one of these Tier 1 examples.
- Refer to the Performance Baselines and Recommendations guide to determine if your processing needs can be achieved with your selected number of named users. For example, you have 30 named users but process a heavy amount of data daily. For best performance, add additional workers to your current tier or move up a tier.

4.1 Tier 1 - Hardware requirements (25-50 named users)

We support the installation of all Relativity components on a single device for 25-50 named user agreements. We also require that a hypervisor is installed to this device so each Relativity role has its own virtual machine.

Hardware	Minimum Requirements
Memory	192GB RAM
Processor	64 logical cores (2GHz)
Storage	This server can be attached to a storage device (SAN, DAS, NAS).

The following table provides virtual machine specifications for the single server setup.

Tier 1 (25-50 named users) - Single Server Deployment	Quantity	Memory (GB)	CPU
Web	2	8	4
Agent (core)	2	4	4
Agent (dtSearch)	1	4	4
Agent (conversion)	1	8	4
Analytics	1	32	4
Worker	1	16	8
Secret Store	1	4	4
SQL (workspace databases)	1	64	8
SQL (Invariant/Worker Manager server)	1	16	4
Data Grid master/data/client node	1	16	4
Message broker server	1	4	4

While Relativity supports the use of virtual machines, differing configurations are required depending on the tier level of your environment. The number of SQL Servers is influenced by High Availability and Disaster Recovery requirements as described in Infrastructure configuration. You can distribute Relativity workspace databases across multiple SQL instances.

This table lists the recommendations for environments at Tier 1.

Tier 1 (100+ named users) - Entry Level Environment	Quantity	Memory (GB)	CPU
Web	2	16	8
Agent (core)	2	4	4
Agent (dtSearch)	1	4	4
Agent (conversion)	1	16	8
Analytics	1	32	8
Worker	2	16	8
Secret Store	1	4	4
Message broker server	1	4	4
SQL (workspace databases)	1	64	8
SQL (Invariant/Worker Manager server)	1	16	4
Data Grid master node	1 or 3	16	4
Data Grid data nodes	2+	64	4
Data Grid client nodes	2+	16	4
(optional) Data Grid monitoring node	1	8	4

4.2 Tier 2 - Hardware requirements (300 or more named users)

For Tier 2 environments, additional virtual machines are required as well as increased RAM and CPUs as illustrated in the following table. Additionally, it is suggested that SQL (Workspace Databases) instances are not virtualized when supporting larger datasets.

Tier 2 (300+ named users) - Mid Level Environment	Quantity	Memory (GB)	CPU
Web	4	16	8
Agent (core)	3	8	8
Agent (dtSearch)	2	8	8
Agent (conversion)	3	16	8
Analytics (structured analytics)	1	32	8
Analytics (Analytics indexing)	1	32	4
Worker (processing, imaging)	4	16	8

Tier 2 (300+ named users) - Mid Level Environment	Quantity	Memory (GB)	CPU
Secret Store	1	4	4
Message broker server	1	4	4
SQL (workspace databases)	2	256	16
SQL (Invariant/Worker Manager server)	1	32	4
Data Grid master node	1 or 3	16	4
Data Grid data node	2+	64	8
Data Grid client node	2+	16	4
(optional) Data Grid monitoring node	1	8	4

Please take the following into consideration for any sized environment:

Note: For the File (Document) role, the type of storage system used will determine if you need to install the Windows operating system.

File (Document)	■ Processor: 4 cores (2GHz) ■ Memory: 4GB RAM ■ Network: Gigabit Ethernet ■ Storage: See Storage.
SMTP (Notification)	Relativity requires an active SMTP server on your network. It interfaces with this server to send notifications and monthly billing statistics. The hardware requirements for this role are minimal. You can leverage an existing SMTP server in the network or merge this server with the agent server role.

4.3 Storage

For each type of data, the amount of recommended space depends on the number of records imported, as well as the type and length of the expected reviews. Each server or VM needs space for the OS, page file and Relativity installation files. For the Relativity Processing SQL Server, all the same SQL data is required with the exception of SQL Full Text Indexes. Throughput, especially when multiple SQL Servers or Data Grid Data Nodes are virtualized on a single host, should be put through a regiment of rigorous random and sequential read/write IO testing before installation of Relativity is completed.

Recommended space by data type:

Data Type	25-50 Named Users	100+ Named Users	Disk I/O
SQL databases	500 GB	750 GB	High
	The databases can live across multiple storage volumes and SQL instances.		
SQL full text indexes	150 GB	250 GB	Moderate
	Index size depends on the number of fields and records indexed.		
SQL database logs	150 GB	250 GB	High
	Regular transaction log backups keep these values small and provide point in time recovery.		
SQL Tempdb	80 GB	80 GB	High
	We recommend eight 10GB Tempdb data files for new deployments. SSDs recommended.		
SQL backups	500 GB	1000 GB	Low-High
	We recommend having a backup strategy. This volume is not required. Larger data sizes may require higher I/O throughput.		
dtSearch indexes	150 GB	250 GB	Moderate
	The dtSearch index share is typically stored in the same location as the files.		
Analytics indexes	150 GB	250 GB	High
	The Analytics index volume is mounted to the Analytics virtual machine with speed and connectivity similar to that of SQL Server.		
Files (natives/images)	1500 GB	3000 GB	Low-High
	The files may not require a Windows installation depending on the storage. Multiple Processing Workers online will require more file storage I/O.		

Data Type	25-50 Named Users	100+ Named Users	Disk I/O
Viewer cache	500GB	1000GB	High
	Temporarily store natives, images, productions, and other file types the viewer uses. It is recommended that the cache be stored on tier-one storage (SSDs) in environments with hundreds of concurrent users. Recommended 1TB viewer cache space available for every 100 concurrent users.		
Agent (conversion)	250 GB	250 GB	High
	This is the Windows temp directory used during document conversion.		
Worker (native imaging/processing)	250 GB	250 GB	High
	This is the Windows temp directory used by native applications during imaging and processing. This temp location never exceeds 250GB for each Worker server.		
Data Grid data node	1 TB	1-10 TB	High

5 Infrastructure configuration

Infrastructure configuration
Relativity supports the following technologies as part of its infrastructure configuration:

- **Virtualization**
  We suggest virtualizing all Relativity roles except for SQL (workspace databases) and Data Grid Data Nodes. Any hypervisor is supported.

  Note: Virtualizing SQL and Data Grid nodes may simplify meeting HA and DR requirements. However, it can introduce additional layers of complexity when properly configuring and troubleshooting performance and stability related issues. If these roles are virtualized, they should be put through a regiment of rigorous random and sequential read/write IO testing before installation of Relativity is completed. This data should be recorded as a benchmark. CPU and memory usage should be monitored as well to ensure there is no memory and CPU contention.

  The worker servers are CPU intensive and do not store any critical data. Consider not virtualizing this role to possibly reduce licensing costs, assuming there is more than one worker server available.

  We're not opposed to virtualizing SQL (native imaging/processing). This server demands less hardware resources, and any performance issues would impact only these Relativity features.
- **High Availability (HA)**
  Relativity supports SQL Server Failover and File Server Clustering along with available hypervisor solutions.
- **Disaster Recovery (DR)**
  Relativity supports Microsoft SQL Server mirroring, log shipping, and SAN replication technologies. These approaches typically require manual failover and increased downtime.
- **Web Server Load Balancing**
  Relativity supports only single affinity in Windows Network Load Balancing (NLB). The Relativity User Load Balancer (RULB) provides the ability to distribute the user load evenly.
- **Perimeter Networking (DMZ)**
  Relativity requires certain ports to remain open for proper server communication. For more details, download the Relativity Infrastructure Ports Diagram from the Relativity Community. Note that you must have a valid username and password to download this content.

5.1 Guides for infrastructure management

Review the following guides to become familiar with best practices for managing the Relativity infrastructure:

- Pre-Installation Guide
- Environment Optimization Guide
- Infrastructure Planning Recommendations

6 Software requirements

Relativity has specific software requirements for servers or virtual machines, user workstations, and the Relativity Desktop Client. The requirements for servers differ by the role assigned to them in your system configuration.

Note: Make sure that you install the latest service packs and updates for your Windows Operating system and the latest service packs and cumulative updates for your SQL Server. However, compatibility for higher .NET versions is not guaranteed and we do not recommend installing higher .NET versions than what is listed as required by your Relativity version.

6.1 System (servers or virtual machines)

Note: Relativity is compatible with local settings Only for webservice servers.

The general software requirements for servers and virtual machines include Microsoft Windows Server and .NET technologies. Microsoft Office and other applications are required for worker servers.

The following table provides software requirements by server role.

Server Role	Software Requirements
Web	■ Windows Server 2016 or Windows Server 2012 R2 ■ .NET Version 4.7 or .NET Version 4.6.2 ■ .NET Version 3.5
Agent	■ Windows Server 2016 or Windows Server 2012 R2 ■ .NET Version 4.7 or .NET Version 4.6.2 ■ .NET Version 3.5
Analytics	■ Windows Server 2016 or Windows Server 2012 R2 ■ .NET Version 4.7 or .NET Version 4.6.2 ■ .NET Version 3.5 ■ Java
Secret Store	■ Windows Server 2016 or Windows Server 2012 R2 ■ .NET Version 4.7 or .NET Version 4.6.2

Server Role	Software Requirements
Message broker	■ .NET Version 4.7 (compatible with Relativity 9.5.259.2 and higher) or .NET Version 4.6.2 (required in 9.5.196.102 and higher) ■ Service Bus for Windows Server 1.1 with TLS 1.2 Support ■ Windows Server 2012– For more information, see Compatibility considerations for Service Bus for Windows Server on page 25. ■ RabbitMQ
SQL	■ Windows Server 2016 or Windows Server 2012 R2 ■ SQL Server 2012, SQL Server 2014, SQL Server 2016, or SQL Server 2017 ■ .NET Version 4.7 or .NET Version 4.6.2 ■ .NET Version 3.5 Fix for Microsoft KB3138319, KB 3151109 and KB3120595: ■ Cumulative Update 11 for SQL Server 2012 SP 2 ■ Cumulative Update 5 for SQL Server 2014 SP1 ■ Cumulative Update 13 for SQL Server 2014

<table>
<tr><th>Server Role</th><th>Software Requirements</th></tr>
<tr><td>Worker</td><td>
<table>
<tr><th>Software</th><th>Description</th><th>Required for system installation?</th></tr>
<tr><td>Windows Server 2016 or Windows Server 2012 R2</td><td>Required server software.</td><td>Yes</td></tr>
<tr><td>.NET Version 4.7 or .NET Version 4.6.2</td><td>Required server software.</td><td>Yes</td></tr>
<tr><td>Desktop Experience (Windows Server feature)</td><td>Required server software.</td><td>Yes</td></tr>
<tr><td>Microsoft Office 2010 Professional SP2 (32-bit)
or
Microsoft Office 2013 Professional (32-bit)*

Note: *Some features found in files created in different versions of Office may not be available or render correctly when processed or imaged using a different version than the file was originally created in. For more information about features differences between Office versions, please consult the appropriate Microsoft documentation.

or Microsoft Office 2016 Professional (32-bit)
Note the following details regarding our support of Office 2016:
■ You must install a version no earlier than 16.0.4783.1000 (the December 2018 update for Microsoft Office).</td><td>This includes:
■ Excel – used for Processing and Native Imaging of most spreadsheet based documents (xlsx, xlsm, xlsb, odc, ods, etc.).
■ Word – used for Processing and Native Imaging of DOCX, DOCM, DOTX, DOTM, DOC, etc.
■ Powerpoint – used for Processing and Native imaging of PPTX, PPTM, PPSM, POTX, POTM, etc.
■ Outlook – used for Processing and Native imaging of PST, OST, etc.
■ OneNote – used for Processing and Native Imaging of ONE and TMP files, etc.
■ Publisher – used for Processing and Native Imaging of PUB files, etc.</td><td>Yes</td></tr>
</table>
</td></tr>
</table>

Server Role	Software Requirements		
	Software	**Description**	**Required for system installation?**
	■ We recommend that you upgrade Invariant prior to upgrading Microsoft Office. If you upgrade Microsoft Office first, your workers will fail to validate, and Invariant won't run until you upgrade it. ■ We recommend that you uninstall Microsoft Office 2013 before installing Office 2016. ■ OneNote 2016 can't export files containing more than 300 pages to PDF. Processing extracted text will fail in this case, as well. ■ With the introduction of Office 2016 support, the font used to image text files is now Google's Noto Sans; previously, this was Microsoft's Arial Unicode.	**Note:** The Courier New font must be installed on your machine. This font is installed by default when you install Microsoft Office, in which case you must ensure that you don't remove it. **Note:** Relativity doesn't support add-ins for Microsoft Office.	
	Microsoft Works 6–9 File Converter	If you install Microsoft Office 2013, then the Microsoft Works Converter is also required. There are two ways to get the Microsoft Works 6–9 File Converter: ■ Download it here. ■ Through the Microsoft Office 2013 installer	Yes ■ This is only required if you're using Office 2013.
	Microsoft Visio 2010	Used for processing and ima-	No

Server Role	Software Requirements		
	Software	**Description**	**Required for system installation?**
	Professional or Standard SP2 (32-bit) (recommended) or Microsoft Visio 2013 Professional or Standard SP1 (32-bit)	ging VSD, VDX, VSS, VSX, VST, VSW files	■ This is only required for processing and imaging VSD, VDX, VSS, VSX, VST, VSW files.. You can still install processing without this component, but you won't be able to process or image those files without it.
	Microsoft Project 2010 Professional or Standard SP2 (32-bit) (recommended) or Microsoft Project 2013 Professional or Standard SP1 (32-bit)	Used for processing and native imaging of MPP files.	No ■ This is only required for processing and imaging MPP files. You can still install processing without this component, but you won't be able to process or image MPP files without it.
	(optional) Lotus Notes v8.5 and higher ■ Lotus Notes v8.5.3 with Fix Pack 6 ■ Lotus Notes v8.5.2 with Fix Pack 4 ■ Lotus Notes v9.0 ■ Lotus Notes v9.0.1 ■ Lotus Notes v10.0.1	It is recommended that you install Lotus Notes 9 or higher on your workers, because Lotus Notes version 8.5.x cannot read certain Lotus 9 databases. Please note that some Lotus 9 databases cannot be opened in 8.5.x and will generate an error during processing.	No ■ After you install Lotus Notes on the worker, you should restart the worker machine, but there is no need to restart the queue manager service.

Server Role	Software Requirements		
	Software	**Description**	**Required for system installation?**
	Solidworks eDrawings Viewer 2017 (64-bit) version only with SP5 or above Solidworks eDrawings Viewer 2018 (64-bit) Solidworks eDrawings Viewer 2019	Used for processing (text extraction) and imaging for CAD files. This is the only optional component. ■ To download the viewer, go here. ■ Solidworks eDrawings Viewer 2017 SP5 and above is supported.	No ■ The Solidworks eDrawings Viewer is not a pre-requisite for general use of Relativity Processing. Solidworks is only required for performing native imaging and text extraction on any supported CAD files in your data sources. You should install it only on the worker designated to perform these types of jobs. If you attempt to process a CAD file without the Solidworks viewer installed, you receive a simple document-level error prompting you to install it. Once you install the Solidworks viewer, you can retry that error and proceed with your processing job.
	JungUm Global Viewer v9.1 or higher	This is required for processing and imaging GUL files (for Korean documents).	No ■ After you install the JungUm Global Viewer on the worker, you should restart the worker machine, but there is no need to restart the queue manager service.

<table>
<tr><th>Server Role</th><th>Software Requirements</th></tr>
<tr><td></td><td>
<table>
<tr><th>Software</th><th>Description</th><th>Required for system installation?</th></tr>
<tr><td>Hancom Office Hanword 2014 Viewer</td><td>Used for processing and imaging HWP files.</td><td>No
This is only required for processing and imaging HWP files. You can still install processing without this component, but you won't be able to process or image HWP files without it.</td></tr>
</table>
* Microsoft Project and Visio are not required to install and use Relativity Processing. These components are only required if you intend to process Project and Visio files, specifically.
</td></tr>
</table>

6.2 Workstations (end-user PCs)

In Relativity, end users perform their reviews on workstations. Each workstation should be configured with a browser in which to use the Relativity web application, an operating system on which to run the Relativity Desktop Client, and the currently supported version of .NET.

Supported browsers for Relativity Web application	Supported operating systems for Relativity Desktop Client	Supported .NET version
■ Microsoft Internet Explorer 11.x* **Note:** As of August 31, 2017, we no longer support Internet Explore (IE) 10. Please upgrade to a compatible version of IE 11. ■ Google Chrome latest version (on both PC and Mac) ■ Apple Safari v11+ (Mac OS X 10.9) ■ Apple Safari v11+ (Mac OS X 10.10) ■ Firefox latest version (on both PC and Mac)*	■ Windows 10 ■ Windows 8 Desktop Mode (PC) ■ Windows 8.1 ■ Windows 7 ■ Windows Server 2012 R2 ■ Windows Server 2016	■ .NET Version 4.7 or .NET Version 4.6.2

* Although IE11 and Firefox are currently supported in Relativity 9.6, performance testing indicates that they are slower when rendering the List Page in Relativity. IE11 is slower at DOM manipulation in the browser making it less performant in the HTML5 Viewer. For these reasons, we recommend using Chrome.

6.3 Relativity Desktop Client

The Relativity Desktop Client (RDC) is a utility used for importing and exporting documents, images, natives, and productions. This utility requires the following software:

The Relativity Desktop Client requires Microsoft .NET 4.6.2 or above and Visual C++ 2015 Redistributable Update 3 RC.

Your operating system determines whether you need to download the 64-bit or 32-bit version of these applications:

- If you're running a 32-bit machine, you must install the RDC 32-bit and the Visual C++ 2015 Redistributable Update 3 RC. For more information, see Microsoft Visual C++ 2015 Redistributable Update 3 RC.

- If you're running a 64-bit machine, you want to install the RDC 64-bit and the Visual C++ 2015 Redistributable Update 3 RC You may notice a significant improvement in the speed of the RDC with the 64-bit version. However, a 64-bit machine can have both the x86 and x64 redistributables installed at the same time, and it can run the 32-bit or 64-bit version of the RDC.

6.4 Licensing Microsoft products

Relativity requires Microsoft Windows and Microsoft SQL Server, both of which you need to license through Microsoft or one of their resellers. If using Relativity Processing or Native Imaging, you also need to license Microsoft Office, Visio, and Project through Microsoft or one of their resellers.

If Relativity is hosted for external customers, you may need to license Microsoft products through Microsoft's SPLA (Service Provider License Agreement). You can find more information about Microsoft's SPLA program on Microsoft's Hosting site.

Note: We recommend contacting Microsoft, or one of their resellers, for guidance on the licensing options available.

7 Relativity compatibility matrix

7.1 Relativity system requirements matrix

The following table breaks down the supported operating systems, framework, IIS versions, browsers, and versions of SQL Server per Relativity version. For additional Chrome, Firefox, and Safari supported version details, see End user browser and operating system requirements on the next page.

Software	9.6	9.7	10.0	10.1
Operating systems - Relativity Desktop Client				
Windows Server 2012 R2 (64-bit)	√	√	√	√
Windows 7	√	√	√	√
Windows 8 (Desktop Mode only)	√	√	√	√
Windows 8.1	√	√	√	√
Windows 10	√	√	√	√
Operating systems - servers				
Windows Server 2012 R2	√	√	√	√
Windows Server 2016	√	√	√	√
Framework				
Microsoft .NET Version 3.5	√	√	√	√
Microsoft .NET Version 4.6.2	√	√	√	√
Microsoft .NET Version 4.7	√	√	√	√
SQL versions				
SQL Server 2012	√	√	√	√
SQL Server 2014*	√	√	√	√
SQL Server 2016*	√	√	√	√
SQL Server 2017*				√

*See Compatibility considerations for Service Bus for Windows Server below.

7.1.1 Compatibility considerations for Service Bus for Windows Server

Microsoft recommends using Windows Server (version 2012, 2012 R2, or 2016), and Microsoft SQL Server (version 2012, 2016, or 2017) with the Service Bus 1.1 with TLS 1.2 Support update. As of

February 5, 2018, Relativity has tested the Service Bus TLS 1.2 update using the following platform combinations:

- Windows Server 2012 and SQL Server 2012
- Windows Server 2012 R2 and SQL Server 2016
- Windows Server 2016 and SQL Server 2014
- Windows Server 2016 and SQL Server 2016
- Windows Server 2016 and SQL Server 2017

While we aren't aware of any issues on these platforms (including SQL Server 2014), Relativity can't guarantee compatibility outside of Microsoft's official support matrix. Future updates from Microsoft may impact the stability of your infrastructure if you aren't running the service bus on a supported OS and SQL platform.

Note: For information on service bus compatibility, see the Workarounds for Service Bus 1.1 with TLS 1.2 section for your version of Relativityin the Upgrade Guide.

7.2 End user browser and operating system requirements

Note: As of August 31, 2017, we no longer support Internet Explore (IE) 10. Please upgrade to a compatible version of IE 11.

Software	9.6	9.7	10.0	10.1
IE 11	√*	√	√	√
Chrome (for Windows and Mac OSX)	latest version	latest version	latest version	latest version
Firefox (for Windows and Mac OSX)	latest version*	latest version	latest version	latest version
Safari (OSX 10.9)	v. 11+	v. 11+	v. 11+	v. 11+
Safari (OSX 10.10)	v. 11+	v. 11+	v. 11+	v. 11+

* Although IE11 and Firefox are currently supported in Relativity 9.6, performance testing indicates that they are slower when rendering the List Page in Relativity. IE11 is slower at DOM manipulation in the browser making it less performant in the HTML5 Viewer. For these reasons, we recommend using Chrome.

Note: Relativity does not currently support the Linux operating system for any browser.

7.3 Internet Explorer with Compatibility View

Relativity doesn't support using Internet Explorer with Compatibility View enabled. Disable Compatibility View in Internet Explorer using the following steps:

1. Press the **Alt** key.
2. Click **Tools** > **Compatibility View settings**.
3. Remove your URL for Relativity from the list of **Websites you've added to Compatibility View**.
4. Deselect the checkbox labeled **Display intranet sites in Compatibility View**.
5. Click **Close**.

7.4 Relativity release matrix

The following table lists the Invariant (worker manager server) and Outside In versions released with each Relativity release. Along with the Relativity Analytics engine and Secret Store versions compatible with each release of Relativity.

Relativity version	Relativity release date	Outside In version	Invariant version	Analytics engine version	Secret Store version
10.1.290.1	July 15, 2019	Outside In 2019.2.1	5.1.271.8	4.0.6	1.2.4.3

Note: When upgrading to Relativity 5.1.271.8, you must manually upgrade your Invariant workers. This means that you must run the installer on all of the workers.

8 Elasticsearch system requirements

Depending on your infrastructure tier, you have different server specifications and recommendations for the Elasticsearch cluster available to you. Elasticsearch is built on a distributed architecture made up of many servers or nodes. A node is a running instance of Elasticsearch (a single instance of Elasticsearch running in the JVM). Every node in an Elasticsearch cluster can serve one of three roles.

- Master nodes are responsible for managing the cluster.
- Data nodes are responsible for indexing and searching of the stored data.
- Client nodes are load balancers that redirect operations to the node that holds the relevant data, while offloading other tasks.

Set up an entirely separate cluster to monitor Elasticsearch with one node that serves all three roles: master, data, and client. While this setup doesn't take advantage of the distributed architecture, it acts as an isolated logging system that won't affect the main cluster.

8.1 Infrastructure considerations

Consider the following factors when determining the infrastructure requirements for creating an Elasticsearch environment:

- **Infrastructure tier** – When you build out your initial Relativity environment, we use these measures to determine a tier level of 1, 2, or 3. This tier level takes into consideration the number of users, SQL sizes, and the amount of data and activity in your system.
- **Virtual versus physical servers** – Although Elastic recommends physical servers, our implementation doesn't require physical servers. Virtual servers can be implemented for all nodes.
- **Storage type** – Elasticsearch is a distributed system and you should run it on storage local to each server. SSDs are not required.
- **Network connectivity** – Because of the distributed architecture, network connectivity can impact performance, especially during peak activity. Consider 10 GBit as you move up to the higher tiers.
- **Client nodes** – Larger clusters that do not perform heavy aggregations (search against your data), may perform better without client nodes. Simply usie a master and data node configuration with a load balancer to handle data in your cluster.

Note: Elasticsearch won't t allocate new shards to nodes once they have more than 85% disk used.

8.2 Other considerations

- Shield is one of the many plugins that comes with Elasticsearch. Shield provides a user name and password for REST interaction and JWKS authentication to Relativity. JWKS is already running on your Relativity web server.
- The Elasticsearch cluster uses the certificate from a Relativity web server or a load balanced site for authentication to Relativity.

- You can set up the nodes for TLS communication node to node. TLS communication requires a wild card for the nodes that contains a valid chain and SAN names. This is highly recommended for clusters that are in anyway exposed to the internet. You can request a script which can be used against an installation of OpenSSL to create the full chain that is not readily available. All of the certificates are contained within a Java keystore which is setup during installation by the script. To request this script, contact support@relativity.com.
  If you have a chain of certificates with a wild card certificate and private key that contains SAN names of the servers, you can use those certificates to build the Java keystore for TLS.

8.3 Elasticsearch cluster system requirements

The number of nodes required and the specifications for the nodes change depending on both your infrastructure tier and the amount of data that you plan to store in Elasticsearch.

Note: These recommendations are for audit only.

8.3.0.1 Test (425 GB)

Node type	# of nodes needed	CPU	RAM	DISK (GB)
Master/Client/Data	1	8	32	500
Monitoring cluster	0-1	4	8	200

8.3.0.2 Tier 1 (850 GB)

Node type	# of nodes needed	CPU	RAM	DISK (GB)
Master/Data	1	8	32	1000
Client/Data	1	8	32	1000
Monitoring cluster	0-1	4	8	200

8.3.1 Tier 2 (1.5-3TB)

Node type	# of nodes needed	CPU	RAM	DISK (GB)
Data	2-4	8	32	1800
Master*	3	4	8	200
Monitoring cluster	0-1	4	8	200

*Inactive master nodes are used as clients.

8.3.2 Tier 3 (3-15 TB)

Node type	# of nodes needed	CPU	RAM	DISK (GB)
Data	4-20	8	64	1800
Master*	3	4	8	200
Monitoring cluster	1	4	8	200

*Inactive master nodes are used as clients.

To assess the sizes of a workspace's activity data and extracted text, contact support@relativity.com and request the **AuditRecord and ExtractedText Size Gatherer** script.

If you have further questions after running the script, our team can review the amount of activity and monitoring data you want to store in Elasticsearch and provide a personalized recommendation of monitoring nodes required.

8.4 Java version compatibility

See theElastic website for compatible Java versions.

9 Processing system requirements

The following information displays the system requirements for the Processing infrastructure.

9.1 Processing worker hardware specifications

The following table displays the hardware specifications for Processing workers. These requirements are determined by the number of workers needed to achieve a specified range of throughput (# of GB/day).

Worker Specifications	
CPU	8 core
RAM	16 GB
Network	1 Gbps
Storage	Windows Temp SSD recommended
Server	Physical recommended *
Expected throughput	100-150 GB/day **

* The primary reason for using physical workers is for performance. The overhead from virtualization can cause degradation in performance, particularly during text extraction and other CPU-intensive operations. If you do choose to virtualize your workers, beware of over-committing resources on the host. If you have hyper-threading enabled on the host, you may need to allocate 16 vCPUs to each worker to achieve results similar to those in the See the Processing performance section in the Performance Baselines guide.

** Processing source data and system load may impact performance.

9.1.1 Worker manager server software requirements

In addition to meeting the processing system requirements, we recommend referring to the Worker Manager Server Installation Guide for information about other required and optional software on the processing worker.

9.2 Tier hardware requirements

The following table displays the supporting infrastructure per number of workers you want to deploy. Refer to an applicable tier to locate the necessary hardware components to complete your processing infrastructure.

	Tier 1 *Entry Level Environment*	**Tier 2** *Mid Level Environment*	**Tier 3** *Large Scale Environment*
# of Workers	1 - 2	3 - 7	8+
GB/day (source data)	100 - 300	300 - 800	800+

	Tier 1 *Entry Level Environment*	Tier 2 *Mid Level Environment*	Tier 3 *Large Scale Environment*
Invariant (worker manager server) SQL Server	■ Processor: 4 cores ■ Memory: 16 GB ■ Storage I/O (Gbps): 4	■ Processor: 4 - 8 cores ■ Memory: 32 GB ■ Storage I/O (Gbps): 4 - 8	■ Processor: 4 - 8 cores ■ Memory: 64 GB ■ Storage I/O (Gbps): 4 - 8+
File Server	■ Commodity NAS ■ 1+ Gbps network	■ Dedicated NAS (write-back cache available) ■ 4+ Gbps network	■ Enterprise class NAS (SSD tier available) ■ 10+ Gbps network

Note: By default, when you install Relativity, each worker in your environment is designated to do all available work (processing and imaging).

9.3 Required Microsoft Visual C++ redistributables

The following table breaks down which versions of Microsoft Visual C++ are required for which versions of Relativity/Invariant. Note that you're required to install each version of Microsoft Visual C++ only if you're upgrading to the Relativity/Invariant version listed and not if you're installing it for the first time.

	Required Microsoft Visual C++ version (Redistributable x86 and x64)			
Relativity/Invariant version	**2010**	**2012**	**2013**	**2015**
9.3/4.3 (all monthly versions included)	√	√		
9.4/4.4 (all monthly versions included)	√	√	√	
9.5.41.87/4.5.32.2	√	√	√	
9.5.69.85/4.5.60.2	√	√	√	
9.5.133.118/4.5.126.16	√	√	√	
9.5.162.111/4.5.132.8	√	√	√	
9.5.196.102/4.5.188.20	√	√	√	√
9.5.219.30/4.5.189.29	√	√	√	√
9.5.253.62/4.5.245.54	√	√	√	√

	Required Microsoft Visual C++ version (Redistributable x86 and x64)			
Relativity/Invariant version	**2010**	**2012**	**2013**	**2015**
9.5.292.12	√	√	√	√
9.5.309.48	√	√	√	√
9.5.342.116	√	√	√	√
9.5.370.136	√	√	√	√
9.5.411.4	√	√	√	√
9.6.50.31/4.6.48.34	√	√	√	√
9.7.229.5/4.7.230.2	√	√	√	√
10.0.318.5/5.0.267.2	√	√	√	√
10.1.290.1/5.1.271.8	√	√	√	√

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