exterro®
Data Risk Management

BENCHMARK METRICS

FTK SUITE 8.3

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About Exterro

Exterro was founded with the simple vision that applying the concepts of process optimization and data science to how companies manage digital information and respond to litigation would drive more successful outcomes at a lower cost. We remain committed to this vision today. We deliver a fully integrated Data Risk Management platform that enables our clients to address their privacy, regulatory, compliance, digital forensics, and litigation risks more effectively and at lower costs. We provide software solutions that help some of the world's largest organizations, law enforcement and government agencies work smarter, more efficiently, and support the Rule of Law.

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1 Processing Metrics

The processing count and time of various evidence in FTK 8.3 version are recorded.

AWS Machine Configuration:

Machine Details	FTK Central	MSSQL
Machine Type	m5.8x large	
VCPU	32	
No. of Cores	16	
Ram	128 GB	
Server OS Versions	Windows Server 2022 Data Center	
Processor	Intel(R) Xeon(R) Platinum 8259CL CPU @ 2.50GHz 2.50 GHz	
Type of Drive	SSD	
Network Bandwidth	10 Gbps	
Application Version	8.3.0.821	
Schema Version	7.1.257.0	
Case Schema Version	7.1.258.0	

Total Disk Space:

- **For FTKC**: 3.2 TB (200GB, 3 TB)
- **For MSSQL**: 4 TB (500GB, 3TB, 500GB)

Distributed Processing Manager:

- Exterro FTK application is installed in a separate AWS machine.
- The Exterro Database is hosted in a separate AWS machine.
- Distributed Processing Manager (DPM) is installed in a separate machine.
- 3 Distributed Processing Engines (DPEs) are installed in 3 individual AWS machines.

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2 Performance Benchmark Metrics

2.1 Performance Benchmark environment and configuration

A series of performance tests were executed to determine the application load time response when bulk users are accessing the application. A maximum of 10 users were made to log in to the application simultaneously with a ramp-up period of 3 seconds and randomly hit all the Manage pages.

The load details of the database and the server is provided below:

#	Name of the Entity	Active Count
1	Case	2
2	Review Page	28,172,887
3	Total no. of files in all the cases	~ 92 Million

Server	Instance type/processor	Drive			RAM Size	Operating System
		Size	Type	R/W Speed		
Application Server	m5.8x Large (16 core processor)	3.2 TB (200 GB, 3 TB)	SSD	16,000	128 GB	Windows Server 2022 (64 - bit OS)
Database Server	m5.8x Large (16 core processor)	4 TB (500 GB, 3 TB, 500 GB)	SSD	16,000	128 GB	Windows Server 2022 (64 - bit OS)

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2.1.1 Test Bed Set-up

1. The tests were performed on the below user preference settings in the application:
   - Manage Page View : Table View
   - Results per page : 100
   - Ramp-up : 3 seconds

2. The performance scripts of the Manage pages were taken by triggering the APIs from an AWS machine (say Machine 1) and hitting the other AWS machine (say Machine 2). Here, Machine 1 consisted of the Performance Test scripts and Machine 2 consisted of Performance Test data.

2.1.2 AWS Machine Details

- Server Versions : Windows Server 2022 Datacenter (64 – bit OS)
- RAM : 128 GB
- Database Server : MS SQL

***Important**: The metrics are recorded with database cache and index implementation. The database cache query is executed upon every successful upgrade and new installation.*

Name of the Page	No. of users - 1	No. of users - 10
	Average Time Taken (in seconds)	
Manage Case	0.25	0.50
Review	0.70	0.95
Thumbnail View	0.47	0.87

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2.2 Overview of Performance Fixes

1. **Artifact Filters - Common Filters:**
   - Implemented caching for **Facet Tree** and **Facet List** to improve overall filter performance.
   - Certain facets are **excluded from caching** due to frequent updates based on user activity. These include:
     - Labels
     - Bookmarks
     - Issues
     - Custodians
     - KFF
     - Language
     - Evidence Explorer
     - Viewed facet types
   - The cache is refreshed whenever the **Object ID increases**, such as during:
     - Job add evidence
     - Additional analysis
     - Import jobs

2. **Raw Call Cache:**
   - Cache refresh interval is set to **every 2 hours**.
   - **SmartGrid Cache** has been implemented for raw calls used in:
     - List view
     - Thumbnail view
   - SmartGrid Cache has also been implemented for **column filter APIs**, which are used in SmartGrid view.
   - When UI filters include any of the non-cached facets listed above, the system falls back to the **normal database flow** for all related APIs.

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3. **Thumbnail View Performance Improvements:**
   - Enhanced performance for:
     - Sort By
     - Group By

4. **Evidence Explorer:**
   - Improved data retrieval and filtering performance.

5. **Manage Page:**
   - Optimized page load performance through improved caching mechanisms.

6. **Filter Performance Enhancements:**
   - Applied performance improvements across:
     - Quick Filters
     - Column Filters
     - Combinational Filters

7. **Column Template List:**
   - Caching was already implemented for findAllAttributesByColumnSet.
   - Modified to initialize the cache during **service startup**.
   - Existing raw call caching is reused with **no additional changes**.

8. **Chat:**
   - Chat conversation and chat conversion enhancements in the **Review Screen**. The viewer is now capable of loading larger chats faster than before.

9. **Reports:**
   - Fixed performance issues where the Reports wizard took a long time to load when a large number of objects were labeled or bookmarked.
   - Optimized the Report Submission API to handle large volumes of labeled or bookmarked objects more efficiently.

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10. **Thumbnail Group by Logical Size**
    - **Facet Tree Caching**: Added the facet tree call directly to the facet tree cache for faster retrieval times.
    - **Category Exclusion**: Excluded non-essential categories (such as Labels, Bookmarks, Evidence Explorer, etc.) to significantly reduce processing overhead.
    - **Facet Handling**: Implemented targeted enhancements to optimize overall facet processing.

11. **Artifacts API:**
    - **Smart Grid Cache Integration**: Integrated Artifacts query results into the Smart Grid cache for quicker subsequent access.
    - **Query Efficiency**: Streamlined backend logic to eliminate redundant database calls and unnecessary filtering stages.

12. **Column Sets:**
    - **In-Memory Service Startup Loading**: Default column sets are now pre-loaded into in-memory cache during service startup to accelerate retrieval.
    - **Regression Note**: This optimization restores behavior previously introduced in v8.2 HF5.

13. **Evidence Explorer & Combination Scenarios:**
    - **AFF4 Query Refactoring**: Refactored query execution logic to isolate AFF4 evidence checks, drastically reducing performance overhead during combination scenarios.
    - **Regression Note**: Addresses query overhead introduced alongside AFF4 evidence changes in FTK 8.2 SP2 HF7 and FTK 8.3.

14. **Required Configuration Settings:**

To enable and fully leverage these performance improvements, ensure the following keys are set to '**true**' in your **adg.weblabselfhostfile.config** file:

- <add key="UseParallelizedQueryExecution" value="true" />
- <add key="UseParallelizedQueriesForSearchRetrieval" value="true" />
- <add key="EnableFacetCaching" value="true" />

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3 Multiuser Performance Metrics in FTK Central 8.3

The below time stamps (in seconds) are recorded as a comparison **between 1 user and 10 users with 28 million files** in FTK Central 8.3 application (PostgreSQL database) where the ramp-up period is 3 seconds.

3.1 Manage Page

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Manage Case List	0.25	0.50
Review Page	0.70	0.95

3.2 Individual API

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Artifacts API	0.41	0.49
Evidence Explorer API	0.14	0.23

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3.3 Quick Filters

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Quick Filter > Labeled Fields > Apply	0.20	0.42
Quick Filter > Labeled Fields > Remove	0.19	0.39
Quick Filter > Checked Files > Apply	0.12	0.29
Quick Filter > Checked Files > Remove	0.18	0.32
Quick Filter > Toggle Bookmark or Reports Filter > Apply	0.20	0.30
Quick Filter > Toggle Bookmark or Reports Filter > Remove	0.19	0.27
Quick Filter > Ignorable > Apply	0.10	0.16
Quick Filter > Ignorable > Remove	0.18	0.25
Quick Filter > Internet Favorites > Apply	0.15	0.21
Quick Filter > Internet Favorites > Remove	0.18	0.24
Quick Filter > Privileged > Apply	0.10	0.17
Quick Filter > Privileged > Remove	0.18	0.27
Quick Filter > Remove Duplicates > Apply	0.22	0.33
Quick Filter > Remove Duplicates > Remove	0.22	0.33
Quick Filter > Deleted Files > Apply	0.18	0.29
Quick Filter > Deleted Files > Remove	0.18	0.32
Quick Filter > Carved Files > Apply	0.13	0.27
Quick Filter > Carved Files > Remove	0.18	0.33
Quick Filter > Encrypted Files > Apply	0.18	0.34
Quick Filter > Encrypted Files > Remove	0.18	0.34
Quick Filter > From Recycle Bin > Apply	0.18	0.32
Quick Filter > From Recycle Bin > Remove	0.18	0.32
Quick Filter > Ocred Files > Apply	0.13	0.27
Quick Filter > Ocred Files > Remove	0.18	0.29
Quick Filter > Bad Extension > Apply	0.18	0.28

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Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Quick Filter > Bad Extension > Remove	0.18	0.29
Quick Filter > Hidden Files > Apply	0.18	0.28
Quick Filter > Hidden Files > Remove	0.18	0.27
Quick Filter > Email Attachment > Apply	0.52	0.40
Quick Filter > Email Attachment > Remove	0.32	0.39
Quick Filter > Geo Location > Apply	0.19	0.29
Quick Filter > Geo Location > Remove	0.19	0.28
Quick Filter > Ediscovery Refinment > Apply	0.72	0.84
Quick Filter > Ediscovery Refinment > Remove	0.68	0.77
Quick Filter > Containers > Apply	0.23	0.32
Quick Filter > Containers > Remove	0.22	0.28

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3.4 Artifacts

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Artifacts > Highlight > Enabled	0.35	0.86
Artifacts > Highlight > Excluded	0.38	0.86
Artifacts > Highlight > Removed	0.33	0.80
Artifacts > Multimedia > Enabled	1.01	1.23
Artifacts > Multimedia > Excluded	0.34	0.70
Artifacts > Multimedia > Removed	0.33	0.75
Artifacts > Mobile > Enabled	0.34	0.79
Artifacts > Mobile > Excluded	0.38	0.90
Artifacts > Mobile > Removed	0.40	0.90
Artifacts > Chat Apps > Enabled	0.40	1.05
Artifacts > Chat Apps > Excluded	0.37	1.02
Artifacts > Chat Apps > Removed	0.33	1.08
Artifacts > Documents > Enabled	0.46	1.24
Artifacts > Documents > Excluded	0.34	1.15
Artifacts > Documents > Removed	0.36	1.07
Artifacts > Emails > Enabled	0.18	0.44
Artifacts > Emails > Excluded	0.57	1.24
Artifacts > Emails > Removed	0.36	0.82
Artifacts > OS Files > Enabled	0.39	0.81
Artifacts > OS Files > Excluded	0.36	0.87
Artifacts > OS Files > Removed	0.34	0.91
Artifacts > Databases > Enabled	0.40	0.80
Artifacts > Databases > Excluded	0.34	0.96
Artifacts > Databases > Removed	0.41	0.87
Artifacts > Geo Location > City > Load	0.22	0.67

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Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Artifacts > Geo Location > City > Enable	0.38	0.96
Artifacts > Geo Location > City > Excluded	0.22	0.73
Artifacts > Geo Location > City > Removed	0.43	0.93
Artifacts > Others > Enabled	0.38	0.95
Artifacts > Others > Excluded	0.23	0.79
Artifacts > Others > Removed	0.22	0.76
Artifacts > Internet Browser > Enabled	0.36	0.96
Artifacts > Internet Browser > Excluded	0.23	0.69
Artifacts > Internet Browser > Removed	0.22	0.60
Artifacts > System Summary > Enabled	0.36	0.65
Artifacts > System Summary > Excluded	0.37	0.74
Artifacts > System Summary > Removed	0.43	0.49

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3.5 Common Filter

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Common Filter > Bookmarks > Load	0.56	0.70
Common Filter > Bookmarks > Apply	0.33	0.68
Common Filter > Bookmarks > Remove	0.23	0.46
Common Filter > Cerebrus STG1 > Load	0.40	0.57
Common Filter > Custodians > Load	2.99	3.03
Common Filter > Custom Field > Load	0.16	0.18
Common Filter > Date Accessed > Load	0.13	0.14
Common Filter > Date Accessed > 1 > Apply	0.18	0.23
Common Filter > Date Accessed > 1 > Remove	0.23	0.29
Common Filter > Date Created > Load	0.13	0.14
Common Filter > Date Created > 1 > Apply	0.18	0.23
Common Filter > Date Created > 1 > Remove	0.18	0.23
Common Filter > Date Modified > 1 > Load	0.13	0.15
Common Filter > Date Modified > 1 > Apply	0.19	0.24
Common Filter > Date Modified > 1 > Remove	0.19	0.24
Common Filter > Document Content > Cluster Topic > Load	0.17	0.20
Common Filter > Document Content > Cluster Topic > Apply	0.12	0.19
Common Filter > Document Content > Email Address > Load	1.05	1.68
Common Filter > Document Content > CCN > Load	0.18	0.21
Common Filter > Document Content > Phone Number > Load	2.79	7.16
Common Filter > Document Content > SSN > Load	7.90	11.63
Common Filter > Viewed > Load	0.23	0.27
Common Filter > Viewed > NV > Apply	0.32	0.36
Common Filter > Viewed > NV > Remove	0.18	0.27
Common Filter > Viewed > V > Apply	0.20	0.29

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Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Common Filter > Viewed > V > Remove	0.18	0.25
Common Filter > Status > Load	1.27	1.30
Common Filter > Status > Bad Extension > Apply	0.19	0.26
Common Filter > Status > Bad Extension > Remove	0.18	0.24
Common Filter > Status > Deleted Files > Apply	0.19	0.24
Common Filter > Status > Deleted Files > Remove	0.18	0.25
Common Filter > Status > Email Attachment > Apply	0.18	0.24
Common Filter > Status > Email Attachment > Remove	0.18	0.24
Common Filter > Status > Email Related Item > Apply	0.18	0.24
Common Filter > Status > Email Related Item > Remove	0.19	0.25
Common Filter > Status > Email Reply > Apply	0.18	0.23
Common Filter > Status > Email Reply > Remove	0.18	0.24
Common Filter > Status > Encrypted Files > Apply	0.18	0.24
Common Filter > Status > Encrypted Files > Remove	0.18	0.25
Common Filter > Status > Recycle Bin > Apply	0.18	0.24
Common Filter > Status > Recycle Bin > Remove	0.19	0.25
Common Filter > Size > Load	0.13	0.14
Common Filter > Size > Gigantic > Apply	0.18	0.24
Common Filter > Size > Gigantic > Remove	0.18	0.24
Common Filter > Size > Huge > Apply	0.17	0.24
Common Filter > Size > Huge > Remove	0.18	0.26
Common Filter > Size > Large > Apply	0.18	0.25
Common Filter > Size > Large > Remove	0.19	0.25
Common Filter > Size > Medium > Apply	0.18	0.24
Common Filter > Size > Medium > Remove	0.18	0.25
Common Filter > Size > Small > Apply	0.18	0.26
Common Filter > Size > Small > Remove	0.19	0.26

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Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Common Filter > Size > Tiny > Apply	0.19	0.25
Common Filter > Size > Tiny > Remove	0.24	0.24
Common Filter > Size > Empty > Apply	0.17	0.23
Common Filter > Size > Empty > Remove	0.19	0.24
Common Filter > Language > Load	0.07	0.08
Common Filter > Object Types > Load	0.12	0.14
Common Filter > Object Types > Files Email > Apply	0.19	0.25
Common Filter > Object Types > Files Email > Remove	0.19	0.24
Common Filter > Production Sets > Load	0.14	0.14
Common Filter > Production Sets > Apply	0.18	0.23
Common Filter > Production Sets > Remove	0.18	0.24
Common Filter > Labels > Load	0.07	0.08
Common Filter > Labels > 1 > Apply	0.21	0.26
Common Filter > Labels > 1 > Remove	0.18	0.25
Common Filter > Issues > Load	0.11	0.11
Common Filter > KFF > KFF Vendors > Load	0.07	0.06
Common Filter > KFF > KFF Groups > Load	0.05	0.06
Common Filter > KFF > KFF Status > Load	0.05	0.06
Common Filter > KFF > KFF Sets > Load	0.06	0.06
Common Filter > Email Date > Load	0.13	0.14
Common Filter > Email Date > Received > Apply	0.28	0.34
Common Filter > Email Date > Received > Remove	0.18	0.24
Common Filter > Email Date > Sent > Apply	0.30	0.38
Common Filter > Email Date > Sent > Remove	0.18	0.23
Common Filter > Extension > Load	0.25	0.27
Common Filter > Extension > 1 > Apply	0.18	0.23
Common Filter > Extension > 2 > Remove	0.18	0.23

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3.6 Column filters

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Column Filters > Object Name > Apply	0.72	1.62
Column Filters > Object Name > Remove	0.20	0.42
Column Filters > Object ID > Apply	0.23	0.48
Column Filters > Object ID > Remove	0.26	0.52
Column Filters > Create Date > Load	0.06	0.09
Column Filters > Create Date > Apply	0.22	0.29
Column Filters > Create Date > Remove	0.28	0.42
Column Filters > Last Modified Date > Load	0.06	0.08
Column Filters > Last Modified Date > Apply	0.26	0.37
Column Filters > Last Modified Date > Remove	0.27	0.42
Column Filters > File Type > Load	0.06	0.09
Column Filters > File Type > 1 > Apply	0.17	0.34
Column Filters > File Type > Remove	0.20	0.32
Column Filters > File Extension > Load	0.14	0.16
Column Filters > File Extension > Apply	0.20	0.28
Column Filters > File Extension > Remove	0.20	0.29
Column Filters > Path > Apply	0.78	0.83
Column Filters > Path > Remove	0.20	0.27
Column Filters > MD5 > Apply	0.17	0.21
Column Filters > MD5 > Remove	0.27	0.25

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3.7 Evidences

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Evidence 1 > Apply	0.30	0.53
Evidence 1 > Exclude	0.23	0.40
Evidence 1 > Remove	0.23	0.39

3.8 List View

3.8.1 Combination Filters 1: Common Filters + Artifacts + Quick Filters

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Common Filter > Object Types > Files and Emails	0.31	0.80
Common Filter + Artifacts > Chat Applications	0.38	0.93
Common Filter + Artifacts > Chat Applications, Documents	0.41	0.93
Common Filter + Artifacts > Chat Applications, Documents, Internet & Browsers	0.38	0.98
Common Filter + Artifacts > Chat Applications, Documents, Internet & Browsers, Emails	0.38	0.96
Common Filter + Artifacts + Quick Filter Applied On > Remove Containers	0.39	0.97
Common Filter + Artifacts + Quick Filter Applied On > Remove Containers, Remove Notes and Bookmarks, Remove Duplicates [Combination 1 Result] [Quick Filters, Common Filters, Artifacts]	1.39	1.96

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3.8.2 Combination Filters 2: Common Filters + Artifacts + Evidence

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Common Filter > Size > Tiny	0.31	0.80
Common Filter > Size > Tiny, Gigantic	0.20	0.77
Common Filter > Size > Tiny, Gigantic, Small	0.23	0.68
Common Filter > Size > Tiny, Gigantic, Small, Empty	0.20	0.69
Common Filter + Artifacts Filter > Document	0.40	0.80
Common Filter + Artifacts Filter > Document, Email	0.42	0.90
Common Filter + Artifacts Filter + Evidence Explorer > Armstrong	0.32	0.77
Common Filter + Artifacts Filter + Evidence Explorer > Armstrong, Narcos_001	0.22	0.80
Common Filter + Artifacts Filter + Evidence Explorer > Armstrong, Narcos_001, Enron_PST	2.56	0.84
Common Filter + Artifacts Filter + Evidence Explorer > Armstrong, Narcos_001, Enron_PST, MiDatavol.ad1 [Combination 2 Result] [Common, Artifacts, Evidence]	0.25	0.94

3.8.3 Combination Filters 1 Exclusion:

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Combination 1 + Document from Artifact	0.78	1.31

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3.8.4 Combination Filters 2 Exclusion:

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Combination 2 Filters + Common Filter > Size > Small	0.22	0.62
Combination 2 Filters + Common Filter > Size > Small, Empty	0.22	0.60
Combination 2 Filters + Evidence Explorer > Armstrong	0.22	0.63
Combination 2 Filters + Evidence Explorer > Armstrong, Narcos_001 [Exclusion Combo 2 Result]	0.22	0.66

3.8.5 Combination Filters 3: Evidence Dropdown + Evidence Explorer

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Evidence Dropdown > Conspiracy	0.24	0.67
Evidence Dropdown > Conspiracy, Enron PST	0.24	0.70
Evidence Dropdown > Conspiracy, Enron PST, MacMini	0.23	0.73
Evidence Dropdown > Conspiracy, Enron PST, MacMini, Mantooth	0.24	0.73
Evidence Dropdown > Conspiracy, Enron PST, MacMini, Mantooth, Sheriff Taylor	0.24	0.74
Evidence Dropdown > Conspiracy, Enron PST, MacMini, Mantooth, Sheriff Taylor, Armstrong	0.24	0.71
Evidence Dropdown > Conspiracy, Enron PST, MacMini, Mantooth, Sheriff Taylor, Armstrong, Lenovo A369i	0.24	0.80
Evidence Dropdown > Conspiracy, Enron PST, MacMini, Mantooth, Sheriff Taylor, Armstrong, Narcos_001, MiDataVol.ad1	0.24	0.87
Evidence Dropdown + Evidence Explorer > Conspiracy	0.31	0.86

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Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Evidence Dropdown + Evidence Explorer > Conspiracy, Enron PST	0.29	0.84
Evidence Dropdown + Evidence Explorer > Conspiracy, Enron PST, M1DataVol	0.28	0.90
Evidence Dropdown + Evidence Explorer > Conspiracy, Enron PST, M1DataVol, MacMini	0.29	0.98
Evidence Dropdown + Evidence Explorer > Conspiracy, Enron PST, M1DataVol, MacMini, Mantooth [Combination 3 Result] [Evidence Dropdown, Evidence Explorer]	0.29	0.85

3.8.6 Combination Filters 3 Exclusion:

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Evidence Explorer > Conspiracy	0.29	0.87
Evidence Explorer > Conspiracy, M1DataVol	0.34	0.89
Evidence Explorer > Conspiracy, M1DataVol, Mantooth [Exclusion Combo 3 Result]	0.29	0.92

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3.8.7 Combination Filters 4: Evidence Dropdown + Evidence Explorer + Artifacts + Quick Filter + Common Filter

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Artifacts > Document	0.59	1.23
Artifacts > Document, Email	0.51	1.15
Artifacts > Document, Email, Mobile	0.49	1.21
Artifacts + Common Filter > Size	0.33	0.89
Artifacts + Common Filter + Quick Filter > Remove Duplicates	0.77	1.74
Artifacts + Common Filter + Quick Filter > Remove Duplicates, Remove Containers [Combination 3 Result] [Evidence Dropdown, Evidence Explorer, Artifacts, Quick Filter, Common Filter]	0.75	1.70

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3.8.8 Combination Filters 4 Exclusion

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Artifacts > Document	0.52	1.57
Evidence Explorer > MacMini	0.48	1.33
Evidence Explorer > MacMini, MiDataVol	0.47	1.36
Evidence Explorer > MacMini, MiDataVol, Conspiracy [Exclusion Combo 4 Result]	0.53	1.46
Column Template List > Airdrop Background Activity & Discoverability	0.55	0.82
Column Template List > Apple Maps	0.36	0.92
Column Template List > Applications	0.36	0.97
Column Template List > Bluetooth Network	0.36	1.03
Column Template List > Calendar	0.37	1.03
Column Template List > Common	0.36	1.00
Column Template List > Device Information	0.51	1.04
Column Template List > Email	0.41	0.98
Column Template List > Health Data	0.36	0.93
Column Template List > Installed App	0.41	1.03
Column Template List > InteractionC Information	0.35	1.06
Column Template List > Internet	0.43	1.09
Column Template List > Keychain Information	0.35	1.11
Column Template List > KnowledgeC Information	0.45	1.16
Column Template List > Layout	0.36	1.21
Column Template List > Location	0.40	0.90
Column Template List > LocationD Information	0.36	1.24
Column Template List > MMS	0.46	1.31
Column Template List > Media	0.36	1.22
Column Template List > Memory Analysis	0.45	1.18

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Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Column Template List > Mobile	0.35	1.14
Column Template List > Others	0.42	1.32
Column Template List > Notes	0.38	1.28
Column Template List > Password	0.43	1.37
Column Template List > Report	0.42	1.28
Column Template List > RoutineD Cached Locations Data	0.38	1.26
Column Template List > Search	0.44	1.23
Column Template List > Software Inventory	0.39	1.10
Column Template List > Summary Information	0.35	0.97
Column Template List > Timeline	0.46	0.97
Column Template List > Volatile	0.37	0.89
Column Template List > WebHistory	0.43	0.84
Column Template List > Wireless Network	0.39	0.82

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3.9 Thumbnail View

3.9.1 Manage Page

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Manage Thumbnail View	0.47	0.87

3.9.2 Sort By ASC

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Sort by > Name (ASC)	0.28	0.59
Sort by > Created Date (ASC)	0.29	0.58
Sort by > Last Modified Date (ASC)	0.28	0.57
Sort by > Path (ASC)	0.54	0.84
Sort by > Logical Size (ASC)	0.58	0.82
Sort by > Extension (ASC)	0.30	0.48
Sort by > Duration (ASC)	0.27	0.43
Sort by > Exif Image Make (ASC)	0.26	0.43
Sort by > Exif Image Model (ASC)	0.26	0.41
Sort by > Stacks (ASC)	0.07	0.11
Sort by > Location City (ASC)	0.26	0.40
Sort by > Location Country (ASC)	0.27	0.41

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3.9.3 Sort By DESC

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Sort by > Name (DESC)	0.28	0.43
Sort by > Created Date (DESC)	0.27	0.44
Sort by > Last Modified Date (DESC)	0.28	0.44
Sort by > Path (DESC)	0.27	0.46
Sort by > Logical Size (DESC)	0.27	0.49
Sort by > Extension (DESC)	0.27	0.53
Sort by > Duration (DESC)	0.29	0.59
Sort by > Exif Image Make (DESC)	0.27	0.63
Sort by > Exif Image Model (DESC)	0.27	0.63
Sort by > Stacks (DESC)	0.31	0.46
Sort by > Location City (DESC)	0.29	0.48
Sort by > Location Country (DESC)	0.28	0.49

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3.9.4 Group By

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Group by > Name	0.32	0.56
Group by > Created Date	0.48	0.78
Group by > Last Modified Date	0.40	0.67
Group by > Duration	2.44	2.74
Group by > Extension	0.35	0.46
Group by > Logical Size	2.42	2.66
Group by > Exif Image Make	0.32	0.50
Group by > Exif Image Model	0.35	0.52
Group by > Stacks	0.13	0.19
Group by > Location City	0.33	0.42
Group by > Location Country	0.32	0.43

3.9.5 Pagination

Scenarios	1 User	10 Users
	Average Time Taken (In Seconds)	
Next Page (100 entries)	0.28	0.39
Previous Page (100 entries)	0.27	0.37

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3.10 Performance Comparison – 1 vs 10 users

The below mentioned comparison table displays the Improvement (in percentage) for a single user and 10 users in MSSQL database where the ramp-up period is 3 seconds:

Areas	1 User (Average time in seconds)	10 Users (Average time in seconds)
Manage Page loading	0.39	0.61
Quick Filters	0.22	0.33
Artifacts Filters	0.37	0.87
Common Fitlers	0.38	0.54
Column Filters	0.25	0.39
Evidence Explorer	0.25	0.44
Combinational Filters	0.42	0.96
Column Template List	0.40	1.08
Thumbnail View - Sort by	0.29	0.51
Thumbnail View - Group by	0.71	0.90
AVERAGE	0.37	0.66

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For technical difficulties, support is available through support@exterro.com.

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