

SCALING A NUIX REST CLUSTER TO ONE TERABYTE PER HOUR

Ultra-fast processing of real-world data using a Nuix REST Cluster running in Amazon Web Services

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OBJECTIVE

Increasing volume and complexity of data continue to challenge the ability to defensibly process vast amounts of unstructured content for eDiscovery, investigations, regulatory compliance and other use cases. To address the need for increasing throughput, Nuix has developed a new Nuix Core Engine REST clustering capability.

In benchmarking, we found a Nuix REST Cluster running in Amazon Web Services (AWS) exceeded 1 terabyte (TB) per hour processing throughput on complex real-world data for nominal AWS infrastructure costs. While 1 TB per hour is an arbitrary milestone, it effectively demonstrates that the Nuix cluster can scale to meet the most demanding organizational needs.

Here is a summary of our benchmarking setup and results:

- **Test 1 (Ubuntu):** The cluster deployed 180 Nuix workers, each assigned 11GB of memory, across 10 Nuix REST instances, each with its own Nuix case. It achieved a **sustained processing rate of 1086.66 GB/h** (or 6.037GB/h per worker) on Ubuntu without HCL Notes (formerly IBM Lotus Notes) data. This represents a 929% increase in total throughput and a 67% reduction in per-GB infrastructure costs as compared to a single instance.
- **Test 2 (Windows):** The cluster deployed 198 Nuix workers, each assigned 11 GB of memory, across 11 Nuix REST instances, each with its own Nuix case. It achieved a **sustained processing rate of 1038.29 GB/h** or 5.2439 GB/h per worker on Windows with HCL Notes data. This represents an 890% increase in total throughput and a 74% reduction in per-GB infrastructure costs as compared to a single instance.

NUIX CORE ENGINE REST CLUSTER

Nuix introduced clustering into the Core Engine REST service as a result of conversations with customers and partners. We learned that multiple organizations had already built or were in the process of implementing their own orchestration layers around the Nuix Core Engine to achieve greater scale and more efficient use of computing resources. Customers and partners sought to manage work across multiple virtual or physical machines to optimize tasks, increase automation and pursue an always-on model appropriately sized to their needs.

Given these insights, we designed the Nuix REST Cluster to provide:

- Horizontal scalability
- Optimization of computing resources
- Reduction of bespoke code under maintenance.

The solution involved creating a single point of interaction for the cluster, introducing a layer of abstraction that ensured each function was performed on an appropriate member node without the invoker needing to know which node was doing the work (see Figure 1).

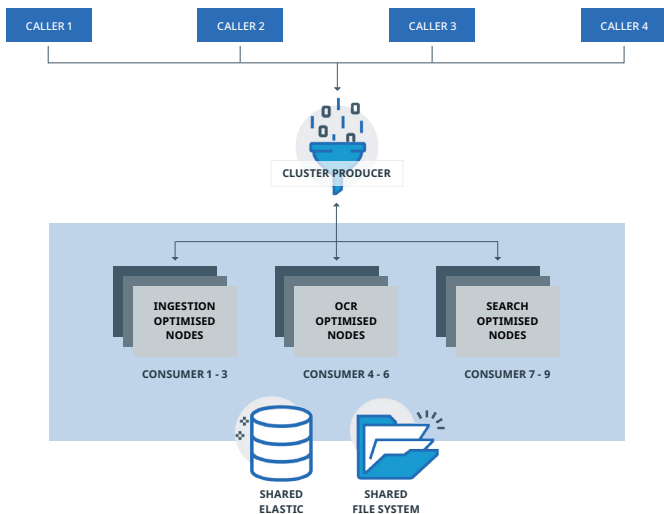


Figure 1: High-level overview of the Nux REST Cluster

TASK PROCESSING USING PRODUCER AND CONSUMER NODES

Nux designed the REST Cluster to address horizontal scalability concerns by reducing resource contention over local hardware. Nodes that participate in the REST Cluster support this goal and are assigned one of two roles: producer or consumer.

PRODUCER NODES

Producer nodes can respond to synchronous tasks, such as returning function status, and are responsible for placing asynchronous worker-based operations in the cluster task queue. The API checks the queue status, including queue capacity, size and the status of tasks in the data buffer. Producer nodes do not perform asynchronous tasks or worker-based operations such as processing, optical character recognition (OCR) or export.

CONSUMER NODES

Consumer nodes pick up and execute asynchronous or worker-based operations. Using a filter chain, these nodes poll the task queue and take on the tasks they are capable of processing. If all conditions pass the filters, then the consumer can lock and claim the task. This results in a natural load-balancing effect.

The following describes the filters that are currently implemented.

Consumer node filter

Case exists filter

Ensures the consumer node has local access to the case the task is running against

Task status filter

Ensures the consumer node will only claim a task in the NOT_STARTED state

Capacity filter

Ensures the consumer node will only claim a task if the task executor on the node has capacity

Node tag filter

If node steering has been applied to a task, ensures the consumer node will only claim a task if the task has been directed to this node

Worker based task filter

Ensures the consumer node will only claim a task provided it has enough workers to complete the task

Consumer nodes that are stressed or do not have the resources to complete a task cannot pick up a task for execution.

Task management within the cluster is shown below in Figure 2.

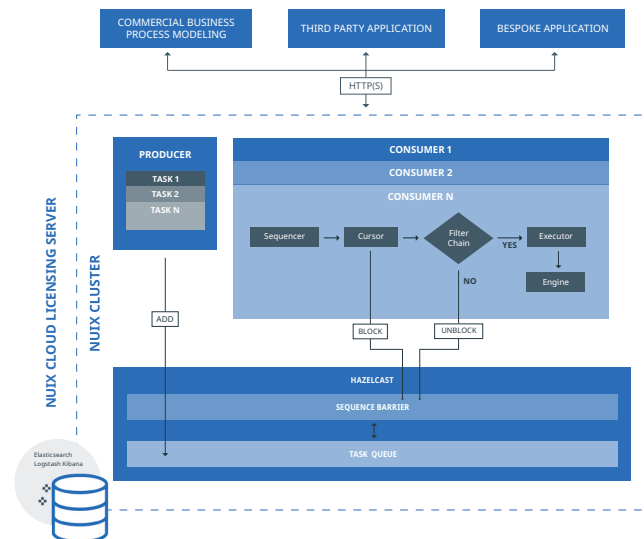


Figure 2: Task management framework in the Nux REST Cluster

The Nux Core Engine REST service is not intended to be a workflow or business process management (BPM) tool. For those needs, we recommend leveraging Nux Automation, a partner application such as Rampiva Automate or an enterprise BPM such as Microsoft Flow or Camunda.

The REST service's ability to cluster is intended to support:

- Implementation of bespoke applications
- Integration of best of breed systems
- OEM use cases
- Automating processes using an enterprise BPM, where separating the concerns of workflow and scale is a consideration.

For more information on common error scenarios that may occur when using the cluster, including fault tolerance, recovery and exception management, see the [Cluster Error Scenarios](#) section of the available documentation.

TEST COMPONENTS

We ran a series of benchmarking tests on AWS infrastructure using the Nuix Core Engine REST service and Elasticsearch as well as required dependencies.

TEST CONFIGURATION

The following table describes our test configuration.

Test 1 (Ubuntu):	Test 2 (Windows):
11 r5.8xlarge instances for the Nuix Core Engine REST Cluster	12 r5.8xlarge instances for the Nuix Core Engine REST Cluster
<ul style="list-style-type: none">1 producer node10 consumer nodes	<ul style="list-style-type: none">1 producer node11 consumer nodes

Both tests used the same 21 m5.2xlarge instances for the Elasticsearch back end, specifically:

- 3 master nodes
- 3 coordinator nodes
- 15 data nodes

We used Terraform to deploy the instances and Ansible to install and configure the Nuix Core Engine REST service. For more information on the configuration of the test environments, see Appendix A: Server Configurations on page 6.

TEST DATA

Using meaningful real-world data for this benchmark was a priority. The Nuix Solutions Consulting team assembled 146 GB of diverse, complex and containerized data to ensure the processing throughput rates in this paper were applicable to real world scenarios. We replicated this data to create a corpus exceeding 1 TB. Before testing, we manually uploaded the data to an AWS S3 bucket, then downloaded to a shared Elastic File System (EFS) disk for the Ubuntu test and an Elastic Block Store (EBS) disk for the Windows test. For the Windows test, the EBS file system was exported as a network share, using Microsoft's Server Message Block (SMB) protocol to all REST instances.

To see a summary of processed test data by item kind from the Windows test, which included HCL Notes test data, see Appendix F: Test Data Set Details on page 10.

The following table provides a summary of processed data by item kind from the Windows test.

Item kind	Item count	Total audited count*	Total audited size** (GB)	Total digest input size (GB)
calendar	5,830	5,830	0.060	0.140
chat-conversation	11	11	0.000	0.000
chat-message	104	104	0.000	0.000
contact	824	824	0.000	0.000
container	90,068	0	0.000	131.570
database	1,341	1,250	0.710	0.980
document	65,329	65,292	25.870	25.870
drawing	246,142	504	0.170	65.110
email	113,095	113,095	1.670	42.350
image	590,706	35,342	2.720	72.310
log	328	4	0.000	0.310
multimedia	1,266	1,266	0.720	0.720
no-data	2,210	2,196	0.000	0.000
other-document	76,885	75,107	0.550	0.550
presentation	36,191	36,191	80.010	80.010
spreadsheet	83,999	83,997	35.250	35.250
system	87,881	83,251	14.150	14.150
unrecognised***	136,253	135,384	86.860	86.870

TEST PROCEDURE

To perform these tests, we used LoadRunner 2020 to issue concurrent REST calls over HTTP. We applied processing job settings – including case evidence, data processing, parallel processing and other settings – using Nuix processing profiles detailed in Appendix D: Nuix Processing Job Configuration on page 7.

While tests were in progress, we monitored server resources using CloudWatch and Kibana.

To successfully process all the emails in the test corpus, it was necessary to exclude evidence, Nuix case and worker temp directories from Windows Defender antivirus real-time monitoring because we intentionally included known malware (W32/MyDoom-O) in the data set.

* "Audited count" is a Nuix classification that identifies the number of material items in the test data set. Audited count excludes objects that are considered noise or immaterial to the goals of an investigator or reviewer.

** "Audited size" is a Nuix classification that identifies the size of material items in the test data set. Audited size excludes objects that are considered noise or immaterial to the goals of an investigator or reviewer.

*** "Unrecognised" is a Nuix data classification that identifies miscellaneous data, including plain text and binary files, in the test data set. As the test data contained disk images, a large number of binary (that is, application/octet-stream) items were present in the set.

To view item kind summaries for both tests – as well as specific breakdowns of MIME types and item types – see Appendix F: Test Data Set Details on page 10.

TEST RESULTS

Results were consistent with expected values for Ubuntu and Windows tests given the variance in operating systems and test data.

SCALING AND UTILIZATION

EFS and EBS utilization, CPU utilization of REST nodes and CPU utilization of Elasticsearch nodes performed as expected. This demonstrates that given a well-resourced Elasticsearch cluster, ingestion speed can scale linearly from one consumer node to the number of consumer nodes needed to achieve the 1 TB/h milestone while member nodes maintained full utilization.

A review of the resource usage charts (Figure 3 and Figure 4) show that our testing met this expectation.

Windows CPU utilization charts for the Nuix Core Engine REST Cluster and Elastic cluster are available in Appendix G: Windows Test CPU Utilization on page 24.

As we increased the number of consumer nodes within the cluster, we found performance scaled linearly, resulting in the desired efficiencies.

CPU UTILIZATION (%)

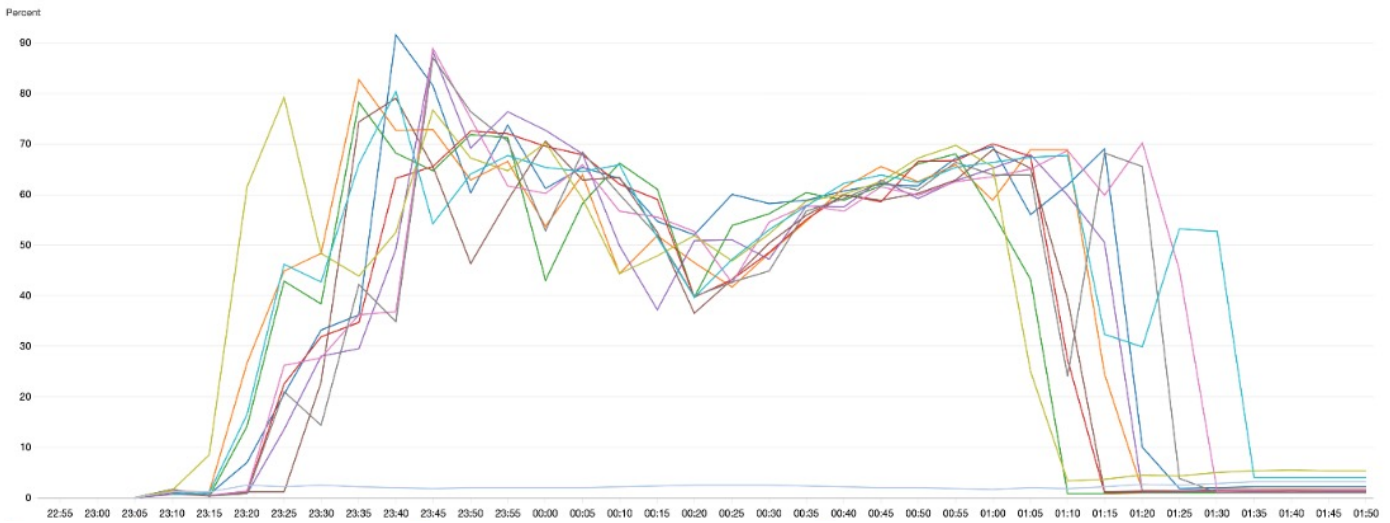


Figure 3: Nuix Core Engine REST CPU utilization (Ubuntu)

CPU UTILIZATION (%)

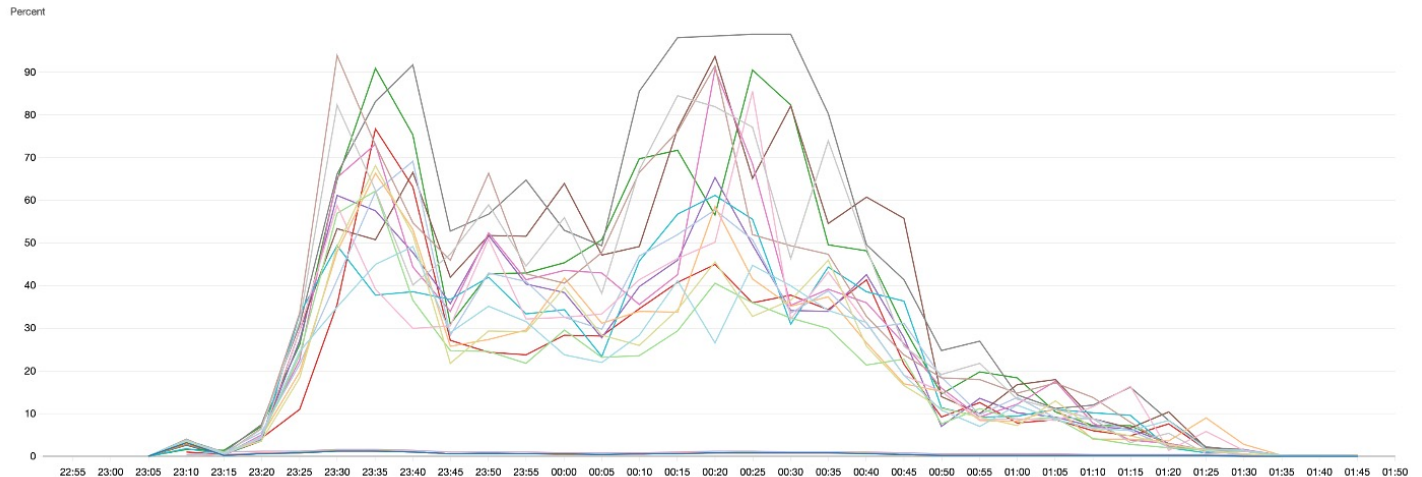


Figure 4: Elasticsearch Nodes CPU utilization (Ubuntu)

INFRASTRUCTURE COSTS

The following tables show the AWS infrastructure costs related to each test in its specific environment. They do not include software licensing costs and should not be interpreted as “per Gig” pricing. They show that increasing the number of nodes delivers near-linear scalability of throughput and achieves economies of scale of more than two-thirds in the infrastructure costs per GB of data processed.

WINDOWS TEST

AWS infrastructure costs for the Windows test

Number of consumer nodes	Throughput rate (GB per hour)	Throughput % increase	Total cluster cost per hour	Cluster cost per GB	Reduction in per-GB infrastructure costs
1	113.26	-	\$18.25	\$0.161	-
5	503.56	444%	\$33.06	\$0.066	59.0%
11	1052.23	929%	\$55.27	\$0.053	67.1%

UBUNTU TEST

AWS infrastructure costs for the Ubuntu test

Number of consumer nodes	Throughput rate (GB per hour)	Throughput % increase	Total cluster cost per hour	Cluster cost per GB	Reduction in per-GB infrastructure costs
1	122.10	-	\$15.51	\$0.127	-
5	573.17	469%	\$24.43	\$0.042	66.9%
10	1086.62	890%	\$35.57	\$0.032	74.8%

More information on AWS infrastructure costs, see Appendix B: Cost Summary on page 7.

CONCLUSION

This testing effort focused on processing data – or normalizing heterogeneous unstructured data – from real-world use cases into a Nuix index. The results met expectations by achieving a throughput rate of over a terabyte per hour while efficiently utilizing the cluster’s resources. Following this exercise, we identified opportunities for further study, including:

- Adding greater volume and more complex data types to the test data set
- Publication of the data set used for testing, following removal of all personally identifying information
- Expanding the benchmark to include post-processing steps such as deduplication, de-NISTing, date filtering, keyword searching and promotion to review, to benchmark a representative “time to review” workflow.

What’s next for the Nuix Core Engine REST Cluster?

Nuix will keep investing in this area to make complex data processing jobs faster, cheaper and simpler. To achieve this, we will focus on:

- Introducing auto-provisioning for AWS, Microsoft Azure and on-premises installations allowing the Nuix REST Cluster to run as a single instance while unutilized and spin up instances as needed
- Introducing the ability to assign all CPU, memory and other resources of a cluster to a single, very large job across many instances using Nuix’s existing brokers and agents
- Simplifying logging, debugging and diagnostics retrieval to reduce the complexity of troubleshooting.

FEEDBACK

We welcome feedback and are interested in improving our benchmarking studies in the future. If you have questions, comments or suggestions, please reach out to sd@nuix.com. We also encourage continued conversation through the Nuix Community Forums.

APPENDIX A: SERVER CONFIGURATIONS

AWS INSTANCES USED FOR REST CLUSTER

	Ubuntu		Windows	
	Producer	Consumer	Producer	Consumer
Number of instances	1	10	1	11
Instance type	r5.8xlarge		r5.8xlarge	
AWS instance hourly rate	\$2.016		\$3.488	
vCPUs	32		32	
Memory (GiB)	256		256	
Storage*	Elastic File Store (EFS)		Elastic Block Store (EBS) only	
Networking (Gbps)	10		10	
EBS bandwidth (Mbps)	6,800		6,800	

AWS INSTANCES USED FOR ELASTICSEARCH CLUSTER

	Ubuntu			Windows		
	Master	Coordinator	Data	Master	Coordinator	Data
Number of instances	3	3	15	3	3	15
Instance type	m5.2xlarge			m5.2xlarge		
AWS instance hourly rate	\$0.384			\$0.384		
vCPUs	8			8		
Memory (GiB)	32			32		
Storage*	EFS			EBS only		
Networking (Gbps)	High			High		
EBS bandwidth (Mbps)	1,000			1,000		

* For more detailed information on storage configuration and cost, see the storage summary tables for REST and Elasticsearch clusters, below.

STORAGE SUMMARY FOR REST AND ELASTICSEARCH CLUSTERS (WINDOWS)

	REST producer	REST consumer	Shared Elastic Block Store (EBS) Disk	Elasticsearch master	Elasticsearch coordinator	Elasticsearch data
Number of instances	1	11	1	3	3	15
Disk size (GB)	1536	1536	10240*	512	512	1024
Cost per hour	\$0.21	\$2.35	\$0.23	\$0.21	\$0.21	\$2.13

* Larger EBS volumes have a higher read and write bandwidth. To mitigate expected slowness from HCL Notes on Windows, the performance testing team increased the EBS volume size, resulting in a faster disk.

STORAGE SUMMARY FOR REST AND ELASTICSEARCH CLUSTERS (UBUNTU)

	REST producer	REST consumer	Shared Elastic File Store (EFS)	Elasticsearch master	Elasticsearch coordinator	Elasticsearch data
Number of instances	1	10	1	3	3	15
Disk size (GB)	1536	1536	3072	512	512	1024
Cost per hour	\$0.21	\$2.13	\$0.43	\$0.21	\$0.21	\$2.13

APPENDIX B: COST SUMMARY

The following values are based on AWS costs billed to Nuix at the time of the test. AWS varies its rates on multiple factors, so these figures should only be used as a baseline for this test. Costs do not include Nuix licensing and should not be interpreted as a per-gigabyte cost for processing.

For information on Nuix pricing, contact your Nuix sales representative or visit www.nuix.com/contact-us. For information on AWS infrastructure costs, contact AWS.

COST PER HOUR

	Ubuntu	Windows
Elasticsearch cluster (master, coordinator and data nodes)	\$8.06	\$8.06
Nuix REST Cluster components (producer and consumer nodes)	\$22.18	\$41.86
Storage	\$5.33	\$5.35
Total Cost	\$35.57	\$55.27

TOTAL COST

Operating system	Total cost per hour	Duration of test (hours)	Total cost for test scenario
Ubuntu	\$35.57	1.99	\$70.71
Windows	\$55.27	2.6	\$143.53

APPENDIX C: CONFIGURING ELASTICSEARCH FOR NUIX

In addition to the standard practices suggested by the [Elasticsearch 7.8 documentation](#), the Nuix performance testing team adhered to the following practices throughout this benchmarking exercise.

Note: The same Elasticsearch configuration was used between both the Windows and Ubuntu tests.

ELASTICSEARCH SETUP

- Each Elasticsearch node was run on a distinct AWS EC2 instance.
- Each test had 21 Elasticsearch nodes each with 8 virtual CPUs and 32 GB of memory.
- We used AWS EBS disks with bandwidth up to 4750 Mbps.
- To ensure the network was free of other traffic, we used an AWS account distinct from other Nuix development and production activity.
- The Elasticsearch Java virtual machine heap used was set to no more than 31 GB for each node.
- We used EBS disks were used with no redundant data stores.
- We disabled swapping for Elasticsearch memory.

- We allocated 10 shards per REST consumer for both tests.
- To maximize ingestion speed, we did not enable replica shards. In Nuix production environments, we recommend enabling replica shards after ingestion.
- We configured dedicated Elasticsearch master, Elasticsearch coordinator and Elasticsearch data nodes.
- We used three coordinating-only nodes.

APPENDIX D: NUIX PROCESSING JOB CONFIGURATION

As mentioned in the *Test Procedure* section on page 3, this test invoked multiple jobs across the cluster to exceed 1 TB/h processing throughput. Those multiple jobs were all directed to the single producer node within the cluster. The jobs were then picked up by the consumer nodes, using the logic described in the section *Task Processing Using Producer and Consumer Nodes* on page 2. Most discrete configuration values were stored within the processing profile, but the call itself was invoked 10 times (or 11 times for Windows) from LoadRunner v2020 using the following REST calls.

```
## CREATE CASE
```

```
curl -X POST 'http://{nuix-url}:{nuix-port}/nuix-restful-service/svc/v1/cases' -H 'Content-Type: application/json' -d '{"compound": false, "description": "REST Scalability case", "name": "ESMN_{CasePrefix}_{CaseSuffix}", "elasticSearchSettings": { "cluster.name": "perf_rest_es_cluster", "index.number_of_replicas": 0, "index.number_of_shards": {Shards}, "nuix.transport.hosts": [{"es-hosts"}], "nuix.http.hosts": [{"es-hosts"}]}, "location": "inventory0"}
```

```
## INGEST DATA
```

```
curl -X POST 'http://{nuix-url}:{nuix-port}/nuix-restful-service/svc/v1/cases/{CaseID}/evidence/file' -H 'Content-Type: application/json' -d '{"processingProfile": "{ProcessingProfile}", "target": { "path" : "{EvidenceDir}" }, "parallelProcessingSettings" : { "workerCount" : {WorkerCount}, "workerMemory" : {WorkerMemory}, "workerTemp" : "{workerTemp}" }'}
```

```
## INGESTION STATUS
```

```
curl -X GET 'http://{nuix-url}:{nuix-port}/nuix-restful-service/svc/v1/asyncFunctions/{IngestionFunctionKey}'
```

Variables for the Windows test scenario:

```
{Shards} = 10  
{es-hosts} = '<IP address>'  
{EvidenceDir} = '\\<IP address>\shared\raw-data\  
{ProcessingProfile} = '1TB1HR_18W11G'  
{workerCount} = 18  
{workerMemory} = 11264  
{workerTemp} = '<temp_disk>'
```

PROCESSING JOB CONFIGURATION SETTINGS

Note: The same processing job configuration settings were used for both the Windows and Ubuntu performance tests. Only the workerTempDirectory path, under Parallel Processing Settings, varies depending on the OS.

Case Evidence Settings

Case evidence setting	Value
stopWordsEnabled=false	False
analysisLanguage=ENGLISH	ENGLISH
stemmingEnabled=false	False

Data Processing Settings

Data processing setting	Value
maxBinarySize	250 MB
extractNamedEntitiesFromText	False
processingSettingsSoftwareVersion	9.6.0.122
exportMetadata	False
processLooseFileContents	True
processForensicImages	True
processFamilyFields	False
storeBinary	False
extractShingles	False
populateGraphDatabase	False
classifyImagesWithDeepLearning	False
imagingProfileName	Processing Default
processText	True
indexCharsFields	False
webThumbnailSelected	False
customProcessingAspects	Not configured
customThumbnailSelected	False
ocrProfileName	Default
calculateAuditedSize	True
hideEmbeddedImmaterialData	False
calculateSSDeepFuzzyHash	False
extractNamedEntitiesFromProperties	False
extractNamedEntitiesFromCommunications	False
skinToneAnalysis	False
createPrintedImage	False
digests	MD5
calculatePhotoDNARobustHash	False
faceDetection	False
useNamedEntityProfile	False
calculateProcessingSize	False
createThumbnails=false	False
extractNamedEntitiesFromTextStripped	False
processTextSummaries	False
reuseEvidenceStores	True
performOcr	False
workstationThumbnailSelected	False
maxDigestSize	250 MB

Data Settings

Data setting	Value
renderDpi	100
smartProcessRegistry	false
extractEndOfFileSlackSpace	false
exposeBinaryDataForDirectories	false
addCommunicationDateToEmailDigest	false
extractFromSlackSpace	false
addBccToEmailDigest	false
identifyPhysicalFiles	true
directAccessToMailboxes	false
carveFileSystemUnallocatedSpace	false
useAsposeForWordTextExtraction	false
disabledCarvingMimeTypes	Not configured
recoverDeletedFiles	false
carveUnidentifiedData	false
softwareVersion	9.6.0.122
disabledMimeTypes	application/vnd. symantec-vault-stream- data,application/vnd. ms-registry

Parallel Processing Settings

Parallel processing setting	Value
embedBroker	True
workerCount	16
userDefinedTempDirectory	True
workerTempDirectory	{drive}:\tmp\worker (Windows) or / opt/nuix/tmp/worker/ (Ubuntu)
brokerMemory	4096
runLocalWorkers	True
workerMemory	16384

Password Discovery Settings

Password discovery setting	Value
passwordDiscoveryMode	NONE

Processing Profile Settings

Processing profile settings	Value
settingsModified	True
processingProfileName	1TB1HR_16W16G

APPENDIX E: TOOLS AND DEPENDENCIES

This appendix includes information on the software and dependencies used in this benchmarking exercise.

OPERATING SYSTEM

Application	Operating system	Version
Nuix RESTful Service	Windows Server [Datacenter]	2019
	Ubuntu	18.04.6 LTS
Elasticsearch	Ubuntu	18.04.6 LTS

NUIX SOFTWARE

This exercise was conducted using version 9.6 of Nuix RESTful Service.

Dependencies

- Nuix Management Server 9.6
- Elasticsearch Engine plug-in 9.6.0.122-7.8.1
- Elasticsearch 7.8.1
- HCL Notes 9.0.1

APPENDIX F: TEST DATA SET DETAILS

ITEM KIND SUMMARY (WINDOWS)

Item kind	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
calendar	5,830	5,830	0.060	0.090	0.140
chat-conversation	11	11	0.000	0.000	0.000
chat-message	104	104	0.000	0.000	0.000
contact	824	824	0.000	0.000	0.000
container	90,068	0	0.000	131.570	131.570
database	1,341	1,250	0.710	0.980	0.980
document	65,329	65,292	25.870	25.870	25.870
drawing	246,142	504	0.170	65.110	65.110
email	113,095	113,095	1.670	47.490	42.350
image	590,706	35,342	2.720	72.310	72.310
log	328	4	0.000	0.310	0.310
multimedia	1,266	1,266	0.720	0.720	0.720
no-data	2,210	2,196	0.000	0.000	0.000
other-document	76,885	75,107	0.550	0.550	0.550
presentation	36,191	36,191	80.010	80.010	80.010
spreadsheet	83,999	83,997	35.250	35.250	35.250
system	87,881	83,251	14.150	14.150	14.150
unrecognised	136,253	135,384	86.860	86.870	86.870

ITEM KIND SUMMARY (UBUNTU)

Item kind	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
calendar	3,506	3,506	0.050	0.000	0.090
chat-conversation	11	11	0.000	0.000	0.000
chat-message	104	104	0.000	0.000	0.000
contact	818	818	0.000	0.000	0.000
container	89,012	0	0.000	120.500	120.500
database	1,341	1,250	0.710	0.980	0.980
document	62,895	62,858	24.770	24.770	24.770
drawing	245,287	498	0.150	64.960	64.960
email	83,196	83,196	1.580	0.010	7.420
image	569,083	34,782	2.600	71.340	71.340
log	328	4	0.000	0.310	0.310
multimedia	1,206	1,206	0.650	0.650	0.650
no-data	1,878	1,864	0.000	0.000	0.000
other-document	75,780	74,002	0.540	0.550	0.550
presentation	36,013	36,013	79.580	79.580	79.580
spreadsheet	83,705	83,703	35.050	35.050	35.050
system	87,546	83,240	14.150	14.150	14.150
unrecognised	76,518	75,736	53.970	53.980	53.980

MIME TYPES AND ITEM TYPES (WINDOWS)

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
7-Zip Archive File	application/x-7z-compressed	4	0	0.000	0.230	0.230
AVI Multimedia File	video/avi	42	42	0.010	0.010	0.010
Address Book Contact	application/x-contact	247	247	0.000	0.000	0.000
Adobe Illustrator Artwork	application/vnd.adobe-illustrator	3	3	0.000	0.000	0.000
Adobe InDesign File	application/x-indesign	1	1	0.000	0.000	0.000
Adobe Photoshop Image	application/vnd.adobe-photoshop	3,408	2	0.010	0.730	0.730
Adobe Shockwave/Flash File	application/x-shockwave-flash	41	41	0.010	0.010	0.010
Apple Directory Services Store File	application/vnd.apple-ds-store	2	2	0.000	0.000	0.000
AppleDouble Header File	application/x-applefile-header	15	15	0.000	0.000	0.000
AppleSingle File	application/applefile	4	0	0.000	0.000	0.000
AutoCAD DWF Drawing	image/vnd.autocad-dwf	1	1	0.000	0.000	0.000
AutoCAD DWG Drawing	image/vnd.autocad-dwg	45	2	0.000	0.010	0.010
Borland Paradox Database	application/vnd.borland-paradox	19	19	0.250	0.250	0.250
Borland dBase Database	application/vnd.borland-dbase	372	372	0.040	0.040	0.040
Browser Cache Entry	application/x-browser-cache-entry	40	40	0.000	0.000	0.000
Browser Cookie	application/x-browser-cookie	33	33	0.000	0.000	0.000
Call Record	application/x-call-record	554	554	0.000	0.000	0.000
Case Information	application/x-case-info	1	1	0.000	0.000	0.000
Cellebrite UFDR Image	application/vnd.cellebrite-ufdr-image	1	0	0.000	0.000	0.000
Chat Conversation	application/x-chat-conversation	11	11	0.000	0.000	0.000
Chat Message	application/x-chat-message	104	104	0.000	0.000	0.000
Comma Separated Values	text/csv	4,791	4,791	1.490	1.490	1.490
Common Log Format File	text/x-common-log	2	0	0.000	0.000	0.000
Compuserve Graphic Interchange Format	image/gif	16,010	3,148	0.060	0.260	0.260
Corel Draw 6.0 Graphic	image/vnd.corel-draw-6	795	0	0.000	0.170	0.170
Corel Draw Drawing	image/vnd.corel-draw	839	0	0.000	0.070	0.070
Corel Photo-Paint Image	image/vnd.corel-photo-paint	1,360	1	0.000	0.120	0.120
Corel WordPerfect Graphics	image/vnd.corel-wordperfect-graphics	1,076	0	0.000	0.070	0.070
Database Table	application/x-database-table	33	0	0.000	0.000	0.000
Database Table Row	application/x-database-table-row	662	662	0.000	0.000	0.000
Debian Installer Package	application/vnd.debian.binary-package	1	0	0.000	0.000	0.000
Directory	filesystem/directory	41,568	0	0.000	0.000	0.000
Disk Image	application/x-disk-image	9	0	0.000	34.370	34.370
Drive	filesystem/drive	10	0	0.000	34.370	34.370
Drive	filesystem/drive	10	0	0.000	34.370	34.370
Efax Image	image/vnd.j2global-efax	2	2	0.000	0.000	0.000
EmailXtender Archive	application/vnd.emc-mailxtender	9	0	0.000	0.010	0.010
Empty File	application/x-empty	1,571	1,562	0.000	0.000	0.000
EnCase EWC Disk Image	application/vnd.guidance-encase	7	0	0.000	10.130	10.130
Executable Script File	application/x-executable-script	49	49	0.000	0.000	0.000
Extensible Hypertext Markup Language Document	application/xhtml+xml	1,433	1,433	0.010	0.010	0.010

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
Extensible Markup Language File	application/xml	10,793	10,392	0.280	0.290	0.290
Google Android Resource File	application/vnd.google-android-resource	1	1	0.000	0.000	0.000
Google Cache Index File	application/vnd.google-chrome-cache-index-file	3	0	0.000	0.000	0.000
Google Chrome Autofill Data Entry	application/vnd.google-chrome-autofill-entry	1	1	0.000	0.000	0.000
Google Chrome Cache Block File	application/vnd.google-chrome-cache-block-file	12	12	0.010	0.010	0.010
Google Chrome Cache entry	application/vnd.google-chrome-cache-entry	191	191	0.000	0.000	0.000
Google Chrome Download Entry	application/vnd.google-chrome-download-entry	1	1	0.000	0.000	0.000
Google Chrome History Database	application/vnd.google-chrome-history	3	0	0.000	0.000	0.000
Google Chrome History Entry	application/vnd.google-chrome-history-history-entry	5	5	0.000	0.000	0.000
Google Chrome Login Database	application/vnd.google-chrome-login	3	0	0.000	0.000	0.000
Google Chrome Logins Data Entry	application/vnd.google-chrome-login-entry	2	2	0.000	0.000	0.000
Google Chrome Shortcuts Database	application/vnd.google-chrome-shortcuts	1	0	0.000	0.000	0.000
Google Chrome Web Data Database	application/vnd.google-chrome-web-data	5	0	0.000	0.000	0.000
Google Earth KML Feature	application/vnd.google-earth.kml-feature	102	0	0.000	0.000	0.000
Google Earth KML File	application/vnd.google-earth.kml+xml	28	28	0.130	0.130	0.130
Google Earth KML Placemark	application/vnd.google-earth.kml-placemark	1,383	1,383	0.000	0.000	0.000
HumanConcepts OrgPlus Document	application/vnd.humanconcepts-orgplus	432	0	0.000	0.010	0.010
Hypertext Markup Language Document	text/html	5,373	5,369	0.160	0.170	0.170
INF Configuration File	text/x-inf	2,618	2,618	0.110	0.110	0.110
Inaccessible Content	filesystem/inaccessible	814	809	0.000	0.000	0.000
Ini Style Configuration File	text/x-ini	2,108	2,108	0.020	0.020	0.020
JPEG 2000 Image	image/jp2	906	2	0.000	0.030	0.030
JPEG/JFIF Image	image/jpeg	210,459	14,200	2.290	33.120	33.120
JSON Data File	application/json	775	775	0.000	0.000	0.000
Java Archive	application/java-archive	477	0	0.000	0.750	0.750
Java Keystore File	application/x-java-keystore	1	1	0.000	0.000	0.000
Java Serialised Object Data	application/x-java-serialized-object	3	3	0.000	0.000	0.000
Linux Syslog File	application/vnd.linux-syslog	3	0	0.000	0.080	0.080
Location Record	application/x-location	338	338	0.000	0.000	0.000
Lotus Domino XML Appointment	application/vnd.lotus-domino-xml-appointment-document	2,305	2,305	0.010	0.090	0.050
Lotus Domino XML Mail	application/vnd.lotus-domino-xml-mail-document	29,920	29,920	0.090	47.470	34.910

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
Lotus Domino XML Other Document	application/vnd.lotus-domino-xml-other-document	1,226	1,226	0.000	0.010	0.010
Lotus Domino XML Person Document	application/vnd.lotus-domino-xml-person-document	79	79	0.000	0.000	0.000
Lotus Domino XML Task Document	application/vnd.lotus-domino-xml-task-document	5	5	0.000	0.000	0.000
Lotus Freelance Graphics	image/vnd.lotus-freelance	730	0	0.000	0.090	0.090
Lotus Notes Bitmap Image	image/vnd.lotus-notes-bitmap	3,053	0	0.000	0.030	0.030
Lotus Notes Database	application/vnd.lotus-notes	8	0	0.000	10.940	10.940
Lotus Notes View	application/vnd.lotus-notes-view	63	0	0.000	0.000	0.000
MIDI Audio File	audio/midi	6	6	0.000	0.000	0.000
MIME/HTML Document	application/x-mime-html	7	7	0.020	0.020	0.020
MPEG Audio File	audio/mpeg	42	42	0.020	0.020	0.020
MPEG Video File	video/mpeg	14	14	0.010	0.010	0.010
MPEG-4 Video File	application/mp4	47	47	0.030	0.030	0.030
Mac Mach-O Executable	application/x-mach-o	1	1	0.000	0.000	0.000
MacBinary Archive	application/macbinary	55	0	0.000	0.040	0.040
Macintosh QuickDraw Picture	image/x-pict	16,095	0	0.000	3.130	3.130
Mailbox File	application/mbox	40	0	0.000	0.020	0.020
Microsoft .NET Assembly	application/x-dotnet	2,156	2,156	0.990	0.990	0.990
Microsoft 2007 Access Database	application/vnd.ms-access-acedb	1	1	0.000	0.000	0.000
Microsoft 2007 Chart	application/vnd.openxmlformats-officedocument.drawingml.chart+xml	298	0	0.000	0.000	0.000
Microsoft 2007 Excel Spreadsheet	application/vnd.openxmlformats-officedocument.spreadsheetml.sheet	259	259	0.040	0.040	0.040
Microsoft 2007 Excel VML Drawing	application/vnd.openxmlformats-officedocument.vmlDrawing	503	0	0.000	0.000	0.000
Microsoft 2007 PowerPoint Presentation	application/vnd.openxmlformats-officedocument.presentationml.presentation	340	340	0.870	0.870	0.870
Microsoft 2007 Word Document	application/vnd.openxmlformats-officedocument.wordprocessingml.document	667	667	0.140	0.140	0.140
Microsoft Access Database	application/vnd.ms-access	184	184	0.410	0.410	0.410
Microsoft ActiveX Binary File	application/vnd.openxmlformats-officedocument.activex.binary	83	83	0.000	0.000	0.000
Microsoft Advanced Systems Format (ASF) Multimedia File	video/vnd.ms-asf	34	34	0.100	0.100	0.100
Microsoft Automatic Jumplist	application/vnd.ms-jumplist-automatic-destinations	6	6	0.000	0.000	0.000
Microsoft Backup Tape Archive	application/vnd.ms-backup	15	0	0.000	0.130	0.130
Microsoft Bitmap Font File	application/vnd.ms-fon	626	626	0.010	0.010	0.010
Microsoft Cabinet Archive	application/vnd.ms-cab-compressed	44	0	0.000	0.110	0.110
Microsoft ClipArt Gallery	application/vnd.ms-clipart-gallery	11,171	0	0.000	0.370	0.370
Microsoft Compressed HTML Help File	application/vnd.ms-htmlhelp	51	51	0.010	0.010	0.010
Microsoft Cortana Search Cache Settings File	application/vnd.ms-cortana.settings+json	7	7	0.000	0.000	0.000

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
Microsoft Cortana Search Cache Settings Record	application/vnd.ms-cortana.settings.record+json	1,097	0	0.000	0.000	0.000
Microsoft Draw OLE Object	application/vnd.ms-draw	79	0	0.000	0.000	0.000
Microsoft ESE Database	application/vnd.ms-ese-database	17	0	0.000	0.220	0.220
Microsoft Edge Browser Database	application/vnd.ms-edge-browser-db	1	0	0.000	0.030	0.030
Microsoft Edge History Entry	application/vnd.ms-edge-history-entry	1	1	0.000	0.000	0.000
Microsoft Equation Object	application/vnd.ms-equation	67,987	67,408	0.360	0.360	0.360
Microsoft Excel 95 Spreadsheet	application/vnd.ms-excel-95	2,249	2,249	0.540	0.540	0.540
Microsoft Excel Chart	application/vnd.ms-excel-chart	11,167	0	0.000	3.950	3.950
Microsoft Excel Pre-OLE2 Spreadsheet	application/vnd.ms-excel-pre-ole2	2,608	2,608	0.330	0.330	0.330
Microsoft Excel Spreadsheet	application/vnd.ms-excel	73,765	73,763	32.730	32.730	32.730
Microsoft Excel XML Spreadsheet	application/vnd.ms-excel+xml	1	1	0.000	0.000	0.000
Microsoft Exchange Server Property Store	application/vnd.ms-exchange-edb	1	0	0.000	8.710	8.710
Microsoft Form 2.0 Object	application/vnd.ms-form-object	1,608	0	0.000	0.010	0.010
Microsoft Graph Chart	application/vnd.ms-graph	17,004	0	0.000	0.600	0.600
Microsoft HD Photo Image	image/vnd.ms-photo	33	0	0.000	0.000	0.000
Microsoft Hyperlink Record	application/vnd.ms-hyperlink-record	3,061	46	0.000	0.000	0.000
Microsoft Imaging Format	application/vnd.ms-wim	29	0	0.000	0.310	0.310
Microsoft Installer File	application/vnd.ms-installer	11	0	0.000	0.680	0.680
Microsoft Internet Information Services Log File	application/vnd.ms-iis-log	4	0	0.000	0.000	0.000
Microsoft Journal / Journal Template File	application/vnd.ms-journal	36	36	0.000	0.000	0.000
Microsoft Marshaled Server Object	application/vnd.ms-mso	4,887	0	0.000	0.010	0.010
Microsoft OLE 1.0 Native Wrapper	application/vnd.ms-ole10native-wrapper	137	0	0.000	0.030	0.030
Microsoft OLE2 Attachment Wrapper	application/vnd.ms-ole2-attachment	63	0	0.000	0.020	0.020
Microsoft OLE2 Clipboard Wrapper	application/vnd.ms-ole2-clipboard	18	0	0.000	0.000	0.000
Microsoft OLE2 Encrypted Package File	application/vnd.ms-ole2-encrypted-package	3	3	0.000	0.000	0.000
Microsoft OLE2 File	application/vnd.ms-ole2	8,182	8,156	2.570	2.570	2.570
Microsoft OLE2 Package File	application/vnd.ms-ole2-package	18,456	0	0.000	8.730	8.730
Microsoft OLE2 Standard Link	application/vnd.ms-ole2-std-link	839	839	0.040	0.040	0.040
Microsoft Office Document Imaging	image/vnd.microsoft-modi	3	3	0.000	0.000	0.000
Microsoft Office VBA File	application/vnd.ms-office-vba	344	344	0.010	0.010	0.010
Microsoft OneNote File	application/vnd.ms-onenote	29	29	0.000	0.000	0.000
Microsoft OneNote Package	application/vnd.ms-onenote-package	5	0	0.000	0.000	0.000
Microsoft OneNote Page	application/vnd.ms-onenote-page	36	36	0.000	0.000	0.000
Microsoft OneNote Table of Contents File	application/vnd.ms-onenote-toc	4	0	0.000	0.000	0.000
Microsoft Outlook Appointment	application/vnd.ms-outlook-appointment	322	322	0.000	0.000	0.000
Microsoft Outlook Contact	application/vnd.ms-outlook-contact	275	275	0.000	0.000	0.000

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
Microsoft Outlook Folder	application/vnd.ms-outlook-folder	622	0	0.000	0.000	0.000
Microsoft Outlook Item	application/vnd.ms-outlook-item	76,736	76,736	1.520	0.000	7.310
Microsoft Outlook Message	application/vnd.ms-outlook-msg	363	0	0.000	0.030	0.030
Microsoft Outlook Note	application/vnd.ms-outlook-note	2,307	2,307	0.030	0.000	0.090
Microsoft Outlook Personal Folder	application/vnd.ms-outlook	2	0	0.000	0.010	0.010
Microsoft Outlook Schedule	application/vnd.ms-outlook-schedule	3,110	3,110	0.050	0.000	0.090
Microsoft Outlook Sticky Note	application/vnd.ms-outlook-stickynote	4	4	0.000	0.000	0.000
Microsoft Outlook Task	application/vnd.ms-outlook-task	1	1	0.000	0.000	0.000
Microsoft Photo Editor Object	application/vnd.ms-photo-editor	9,302	0	0.000	14.580	14.580
Microsoft PowerPoint Presentation	application/vnd.ms-powerpoint	35,851	35,851	79.140	79.140	79.140
Microsoft Precompiled Setup Information	application/vnd.ms-pnf	205	205	0.010	0.010	0.010
Microsoft Project File	application/vnd.ms-project	61	61	0.010	0.010	0.010
Microsoft Publisher File	application/vnd.ms-publisher	6	6	0.000	0.000	0.000
Microsoft Registry File	application/vnd.ms-registry	303	0	0.000	0.000	0.000
Microsoft Security Catalog	application/vnd.ms-pkiseccat	10,156	10,156	0.190	0.190	0.190
Microsoft Shortcut	application/vnd.ms-shortcut	362	362	0.000	0.000	0.000
Microsoft Transport Neutral Encapsulation Format File	application/vnd.ms-tnef	7	0	0.000	0.000	0.000
Microsoft Visio Drawing	application/vnd.ms-visio	5,272	148	0.110	2.740	2.740
Microsoft Windows Animated Cursor Image	image/vnd.ms-ani	12	12	0.010	0.010	0.010
Microsoft Windows Cursor Image	image/vnd.ms-windows-cursor	48	48	0.000	0.000	0.000
Microsoft Windows Delta Compression File	application/vnd.ms-windows-update-delta-compressed	26,201	26,201	0.020	0.020	0.020
Microsoft Windows Enhanced Metafile	image/vnd.ms-emf	66,771	67	0.010	15.410	15.410
Microsoft Windows Event Log (pre-Vista)	application/vnd.ms-windows-event-log	5	0	0.000	0.000	0.000
Microsoft Windows Help File	application/vnd.ms-windows-help	18	18	0.000	0.000	0.000
Microsoft Windows Icon Image	image/vnd.microsoft.icon	50	49	0.000	0.000	0.000
Microsoft Windows Mail Account	application/vnd.ms-windows-mail-account	6	0	0.000	0.000	0.000
Microsoft Windows Mail App Database	application/vnd.ms-windows-mail-db	1	0	0.000	0.010	0.010
Microsoft Windows Mail Contact	application/vnd.ms-windows-mail-contact	4	4	0.000	0.000	0.000
Microsoft Windows Mail Folder	application/vnd.ms-windows-mail-folder	73	0	0.000	0.000	0.000
Microsoft Windows Mail Message	application/vnd.ms-windows-mail-msg	273	273	0.000	0.000	0.000
Microsoft Windows Metafile	image/vnd.ms-wmf	137,373	271	0.050	41.680	41.680
Microsoft Windows Prefetch File	application/vnd.ms-windows-prefetch	200	200	0.010	0.010	0.010
Microsoft Windows Side-by-Side (SxS) Manifest File	application/vnd.ms-sxs-manifest+xml	4,633	4,633	0.020	0.020	0.020
Microsoft Windows SysMain Compressed File	application/vnd.ms-windows-sysmain-compressed	214	214	0.010	0.010	0.010

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
Microsoft Windows Vista and Windows 8 Event Log	application/vnd.ms-windows-event-logx	213	0	0.000	0.080	0.080
Microsoft Word Art	application/vnd.ms-word-art	69	0	0.000	0.000	0.000
Microsoft Word Document	application/vnd.ms-word	46,114	46,081	20.020	20.020	20.020
Microsoft Word Picture	application/vnd.ms-word-picture	5,510	0	0.000	0.480	0.480
Microsoft Word Pre-OLE2 Document	application/vnd.ms-word-pre-ole2	118	118	0.020	0.020	0.020
Microsoft Works Spreadsheet	application/vnd.ms-works-ss	6	6	0.000	0.000	0.000
Microsoft Works Word Processor Document	application/vnd.ms-works-wp	2	2	0.000	0.000	0.000
Microsoft XPS Document	application/vnd.ms-xpsdocument	6	6	0.000	0.000	0.000
Mobile Device Information	application/x-mobile-device-info	1	1	0.000	0.000	0.000
NTFS Index Record	filesystem/x-ntfs-index-record	4	4	0.000	0.000	0.000
NTFS LogFile	filesystem/x-ntfs-logfile	2	2	0.050	0.050	0.050
NTFS Master File Table	filesystem/x-ntfs-mft	4	4	0.140	0.140	0.140
NTFS Usnjrnl File	filesystem/x-ntfs-usnjrnl	1	1	0.640	0.640	0.640
NTFS Volume Shadow Catalog	filesystem/x-ntfs-vss-catalog	1	1	0.000	0.000	0.000
NTFS Volume Shadow Store	filesystem/x-ntfs-vss-store	7	0	0.000	0.590	0.590
Native Language Support File	application/x-nls	678	678	0.060	0.060	0.060
NeXTSTEP/MacOS Property List	application/x-plist	1	1	0.000	0.000	0.000
Network Record	application/x-network	2	2	0.000	0.000	0.000
Nuix Evidence File	application/vnd.nuix-evidence	1	0	0.000	0.000	0.000
Nuix Log File	text/x-nuix-log	97	0	0.000	0.140	0.140
OpenDocument Spreadsheet	application/vnd.oasis.opendocument.spreadsheet	1	1	0.000	0.000	0.000
OpenType Font	application/vnd.ms-opentype	2	2	0.020	0.020	0.020
PCX Image	image/pcx	14	13	0.000	0.000	0.000
PKCS #7 MIME Encrypted	application/pkcs7-mime	2	2	0.000	0.000	0.000
PKCS #7 Signature	application/pkcs7-signature	4	4	0.000	0.000	0.000
PKCS #7 Signed Data	application/pkcs7-signed-data	4	4	0.000	0.000	0.000
Plain Text	text/plain	85,995	85,959	41.090	41.090	41.090
Portable Document Format	application/pdf	9,212	9,212	4.330	4.330	4.330
Portable Document Format Portfolio	application/pdf-portfolio	1	0	0.000	0.000	0.000
Portable Network Graphic	image/png	317,083	16,163	0.130	30.360	30.360
Postscript File	application/postscript	486	486	0.520	0.520	0.520
Quattro Pro Spreadsheet	application/vnd.corel-quattro	99	99	0.010	0.010	0.010
RAR Archive File	application/x-rar-compressed	12	0	0.000	0.080	0.080
RDF/XML Metadata File	application/rdf+xml	40	40	0.000	0.000	0.000
vCalendar Data File	text/x-vcalendar	3	0	0.000	0.000	0.000
vCard Contact	text/vcard-contact	219	219	0.000	0.000	0.000
vCard File	text/vcard	219	0	0.000	0.000	0.000

MIME TYPES AND ITEM TYPES (UBUNTU)

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
7-Zip Archive File	application/x-7z-compressed	4	0	0.000	0.230	0.230
AVI Multimedia File	video/avi	42	42	0.010	0.010	0.010
Address Book Contact	application/x-contact	247	247	0.000	0.000	0.000
Adobe Illustrator Artwork	application/vnd.adobe-illustrator	3	3	0.000	0.000	0.000
Adobe InDesign File	application/x-indesign	1	1	0.000	0.000	0.000
Adobe Photoshop Image	application/vnd.adobe-photoshop	3,408	2	0.010	0.730	0.730
Adobe Shockwave/Flash File	application/x-shockwave-flash	41	41	0.010	0.010	0.010
Apple Directory Services Store File	application/vnd.apple-ds-store	2	2	0.000	0.000	0.000
AppleDouble Header File	application/x-applefile-header	15	15	0.000	0.000	0.000
AppleSingle File	application/applefile	4	0	0.000	0.000	0.000
AutoCAD DWF Drawing	image/vnd.autocad-dwf	1	1	0.000	0.000	0.000
AutoCAD DWG Drawing	image/vnd.autocad-dwg	45	2	0.000	0.010	0.010
Borland Paradox Database	application/vnd.borland-paradox	19	19	0.250	0.250	0.250
Borland dBase Database	application/vnd.borland-dbase	372	372	0.040	0.040	0.040
Browser Cache Entry	application/x-browser-cache-entry	40	40	0.000	0.000	0.000
Browser Cookie	application/x-browser-cookie	33	33	0.000	0.000	0.000
Call Record	application/x-call-record	554	554	0.000	0.000	0.000
Case Information	application/x-case-info	1	1	0.000	0.000	0.000
Cellebrite UFDR Image	application/vnd.cellebrite-ufdr-image	1	0	0.000	0.000	0.000
Chat Conversation	application/x-chat-conversation	11	11	0.000	0.000	0.000
Chat Message	application/x-chat-message	104	104	0.000	0.000	0.000
Comma Separated Values	text/csv	4,756	4,756	1.330	1.330	1.330
Common Log Format File	text/x-common-log	2	0	0.000	0.000	0.000
Compuserve Graphic Interchange Format	image/gif	7,425	2,848	0.050	0.160	0.160
Corel Draw 6.0 Graphic	image/vnd.corel-draw-6	795	0	0.000	0.170	0.170
Corel Draw Drawing	image/vnd.corel-draw	839	0	0.000	0.070	0.070
Corel Photo-Paint Image	image/vnd.corel-photo-paint	1,360	1	0.000	0.120	0.120
Corel WordPerfect Graphics	image/vnd.corel-wordperfect-graphics	1,076	0	0.000	0.070	0.070
Database Table	application/x-database-table	33	0	0.000	0.000	0.000
Database Table Row	application/x-database-table-row	662	662	0.000	0.000	0.000
Debian Installer Package	application/vnd.debian.binary-package	1	0	0.000	0.000	0.000
Directory	filesystem/directory	40,735	0	0.000	0.000	0.000
Disk Image	application/x-disk-image	9	0	0.000	34.370	34.370
Drive	filesystem/drive	10	0	0.000	34.370	34.370
Efax Image	image/vnd.j2global-efax	2	2	0.000	0.000	0.000
EmailXtender Archive	application/vnd.emc-mailxtender	9	0	0.000	0.010	0.010
Empty File	application/x-empty	1,248	1,239	0.000	0.000	0.000
EnCase EWC Disk Image	application/vnd.guidance-encase	7	0	0.000	10.130	10.130
Executable Script File	application/x-executable-script	49	49	0.000	0.000	0.000
Extensible Hypertext Markup Language Document	application/xhtml+xml	1,433	1,433	0.010	0.010	0.010
Extensible Markup Language File	application/xml	10,631	10,311	0.270	0.280	0.280

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
Google Android Resource File	application/vnd.google-android-resource	1	1	0.000	0.000	0.000
Google Cache Index File	application/vnd.google-chrome-cache-index-file	3	0	0.000	0.000	0.000
Google Chrome Autofill Data Entry	application/vnd.google-chrome-autofill-entry	1	1	0.000	0.000	0.000
Google Chrome Cache Block File	application/vnd.google-chrome-cache-block-file	12	12	0.010	0.010	0.010
Google Chrome Cache entry	application/vnd.google-chrome-cache-entry	191	191	0.000	0.000	0.000
Google Chrome Download Entry	application/vnd.google-chrome-download-entry	1	1	0.000	0.000	0.000
Google Chrome History Database	application/vnd.google-chrome-history	3	0	0.000	0.000	0.000
Google Chrome History Entry	application/vnd.google-chrome-history-entry	5	5	0.000	0.000	0.000
Google Chrome Login Database	application/vnd.google-chrome-login	3	0	0.000	0.000	0.000
Google Chrome Logins Data Entry	application/vnd.google-chrome-login-entry	2	2	0.000	0.000	0.000
Google Chrome Shortcuts Database	application/vnd.google-chrome-shortcuts	1	0	0.000	0.000	0.000
Google Chrome Web Data Database	application/vnd.google-chrome-web-data	5	0	0.000	0.000	0.000
Google Earth KML Feature	application/vnd.google-earth.kml-feature	102	0	0.000	0.000	0.000
Google Earth KML File	application/vnd.google-earth.kml+xml	28	28	0.130	0.130	0.130
Google Earth KML Placemark	application/vnd.google-earth.kml-placemark	1,383	1,383	0.000	0.000	0.000
HumanConcepts OrgPlus Document	application/vnd.humanconcepts-orgplus	432	0	0.000	0.010	0.010
Hypertext Markup Language Document	text/html	5,370	5,366	0.160	0.160	0.160
INF Configuration File	text/x-inf	2,618	2,618	0.110	0.110	0.110
Inaccessible Content	filesystem/inaccessible	709	704	0.000	0.000	0.000
Ini Style Configuration File	text/x-ini	2,108	2,108	0.020	0.020	0.020
JPEG 2000 Image	image/jp2	697	0	0.000	0.030	0.030
JPEG/JFIF Image	image/jpeg	202,652	14,053	2.180	32.460	32.460
JSON Data File	application/json	775	775	0.000	0.000	0.000
Java Archive	application/java-archive	477	0	0.000	0.750	0.750
Java Keystore File	application/x-java-keystore	1	1	0.000	0.000	0.000
Java Serialised Object Data	application/x-java-serialized-object	3	3	0.000	0.000	0.000
Linux Syslog File	application/vnd.linux-syslog	3	0	0.000	0.080	0.080
Location Record	application/x-location	338	338	0.000	0.000	0.000
Lotus Domino XML Mail	application/vnd.lotus-domino-xml-mail-document	118	118	0.000	0.000	0.000
Lotus Domino XML Other Document	application/vnd.lotus-domino-xml-other-document	133	133	0.000	0.000	0.000

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
Lotus Domino XML Person Document	application/vnd.lotus-domino-xml-person-document	79	79	0.000	0.000	0.000
Lotus Freelance Graphics	image/vnd.lotus-freelance	730	0	0.000	0.090	0.090
Lotus Notes Bitmap Image	image/vnd.lotus-notes-bitmap	9	0	0.000	0.000	0.000
Lotus Notes Database	application/vnd.lotus-notes	6	0	0.000	0.000	0.000
Lotus Notes View	application/vnd.lotus-notes-view	6	0	0.000	0.000	0.000
MIDI Audio File	audio/midi	6	6	0.000	0.000	0.000
MIME/HTML Document	application/x-mime-html	7	7	0.020	0.020	0.020
MPEG Audio File	audio/mpeg	42	42	0.020	0.020	0.020
MPEG Video File	video/mpeg	13	13	0.010	0.010	0.010
MPEG-4 Video File	application/mp4	46	46	0.020	0.020	0.020
Mac Mach-O Executable	application/x-mach-o	1	1	0.000	0.000	0.000
MacBinary Archive	application/macbinary	55	0	0.000	0.040	0.040
Macintosh QuickDraw Picture	image/x-pict	16,094	0	0.000	3.130	3.130
Mailbox File	application/mbox	40	0	0.000	0.020	0.020
Microsoft .NET Assembly	application/x-dotnet	2,156	2,156	0.990	0.990	0.990
Microsoft 2007 Access Database	application/vnd.ms-access-acedb	1	1	0.000	0.000	0.000
Microsoft 2007 Chart	application/vnd.openxmlformats-officedocument.drawingml.chart+xml	167	0	0.000	0.000	0.000
Microsoft 2007 Excel Spreadsheet	application/vnd.openxmlformats-officedocument.spreadsheetml.sheet	150	150	0.010	0.010	0.010
Microsoft 2007 Excel VML Drawing	application/vnd.openxmlformats-officedocument.vmlDrawing	488	0	0.000	0.000	0.000
Microsoft 2007 PowerPoint Presentation	application/vnd.openxmlformats-officedocument.presentationml.presentation	241	241	0.610	0.610	0.610
Microsoft 2007 Word Document	application/vnd.openxmlformats-officedocument.wordprocessingml.document	247	247	0.070	0.070	0.070
Microsoft Access Database	application/vnd.ms-access	184	184	0.410	0.410	0.410
Microsoft ActiveX Binary File	application/vnd.openxmlformats-officedocument.activex.binary	83	83	0.000	0.000	0.000
Microsoft Advanced Systems Format (ASF) Multimedia File	video/vnd.ms-asf	32	32	0.090	0.090	0.090
Microsoft Automatic Jumplist	application/vnd.ms-jumplist-automatic-destinations	6	6	0.000	0.000	0.000
Microsoft Backup Tape Archive	application/vnd.ms-backup	15	0	0.000	0.130	0.130
Microsoft Bitmap Font File	application/vnd.ms-fon	626	626	0.010	0.010	0.010
Microsoft Cabinet Archive	application/vnd.ms-cab-compressed	44	0	0.000	0.110	0.110
Microsoft ClipArt Gallery	application/vnd.ms-clipart-gallery	11,165	0	0.000	0.370	0.370
Microsoft Compressed HTML Help File	application/vnd.ms-htmlhelp	51	51	0.010	0.010	0.010
Microsoft Cortana Search Cache Settings File	application/vnd.ms-cortana.settings+json	7	7	0.000	0.000	0.000
Microsoft Cortana Search Cache Settings Record	application/vnd.ms-cortana.settings.record+json	1,097	0	0.000	0.000	0.000
Microsoft Draw OLE Object	application/vnd.ms-draw	79	0	0.000	0.000	0.000

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
Microsoft ESE Database	application/vnd.ms-ese-database	17	0	0.000	0.220	0.220
Microsoft Edge Browser Database	application/vnd.ms-edge-browser-db	1	0	0.000	0.030	0.030
Microsoft Edge History Entry	application/vnd.ms-edge-history-entry	1	1	0.000	0.000	0.000
Microsoft Equation Object	application/vnd.ms-equation	67,987	67,408	0.360	0.360	0.360
Microsoft Excel 95 Spreadsheet	application/vnd.ms-excel-95	2,249	2,249	0.540	0.540	0.540
Microsoft Excel Chart	application/vnd.ms-excel-chart	11,163	0	0.000	3.950	3.950
Microsoft Excel Pre-OLE2 Spreadsheet	application/vnd.ms-excel-pre-ole2	2,608	2,608	0.330	0.330	0.330
Microsoft Excel Spreadsheet	application/vnd.ms-excel	73,650	73,648	32.720	32.720	32.720
Microsoft Excel XML Spreadsheet	application/vnd.ms-excel+xml	1	1	0.000	0.000	0.000
Microsoft Exchange Server Property Store	application/vnd.ms-exchange-edb	1	0	0.000	8.710	8.710
Microsoft Form 2.0 Object	application/vnd.ms-form-object	1,284	0	0.000	0.010	0.010
Microsoft Graph Chart	application/vnd.ms-graph	17,004	0	0.000	0.600	0.600
Microsoft Hyperlink Record	application/vnd.ms-hyperlink-record	3,061	46	0.000	0.000	0.000
Microsoft Imaging Format	application/vnd.ms-wim	29	0	0.000	0.310	0.310
Microsoft Installer File	application/vnd.ms-installer	11	0	0.000	0.680	0.680
Microsoft Internet Information Services Log File	application/vnd.ms-iis-log	4	0	0.000	0.000	0.000
Microsoft Journal / Journal Template File	application/vnd.ms-journal	36	36	0.000	0.000	0.000
Microsoft Marshaled Server Object	application/vnd.ms-mso	4,883	0	0.000	0.010	0.010
Microsoft OLE 1.0 Native Wrapper	application/vnd.ms-ole10native-wrapper	137	0	0.000	0.030	0.030
Microsoft OLE2 Attachment Wrapper	application/vnd.ms-ole2-attachment	63	0	0.000	0.020	0.020
Microsoft OLE2 Clipboard Wrapper	application/vnd.ms-ole2-clipboard	18	0	0.000	0.000	0.000
Microsoft OLE2 Encrypted Package File	application/vnd.ms-ole2-encrypted-package	3	3	0.000	0.000	0.000
Microsoft OLE2 File	application/vnd.ms-ole2	8,181	8,155	2.570	2.570	2.570
Microsoft OLE2 Package File	application/vnd.ms-ole2-package	18,423	0	0.000	8.680	8.680
Microsoft OLE2 Standard Link	application/vnd.ms-ole2-std-link	839	839	0.040	0.040	0.040
Microsoft Office Document Imaging	image/vnd.microsoft-modi	3	3	0.000	0.000	0.000
Microsoft Office VBA File	application/vnd.ms-office-vba	344	344	0.010	0.010	0.010
Microsoft OneNote File	application/vnd.ms-onenote	29	29	0.000	0.000	0.000
Microsoft OneNote Package	application/vnd.ms-onenote-package	5	0	0.000	0.000	0.000
Microsoft OneNote Page	application/vnd.ms-onenote-page	36	36	0.000	0.000	0.000
Microsoft OneNote Table of Contents File	application/vnd.ms-onenote-toc	4	0	0.000	0.000	0.000
Microsoft Outlook Appointment	application/vnd.ms-outlook-appointment	322	322	0.000	0.000	0.000
Microsoft Outlook Contact	application/vnd.ms-outlook-contact	275	275	0.000	0.000	0.000
Microsoft Outlook Folder	application/vnd.ms-outlook-folder	622	0	0.000	0.000	0.000
Microsoft Outlook Item	application/vnd.ms-outlook-item	76,736	76,736	1.520	0.000	7.310
Microsoft Outlook Message	application/vnd.ms-outlook-msg	363	0	0.000	0.030	0.030
Microsoft Outlook Note	application/vnd.ms-outlook-note	2,307	2,307	0.030	0.000	0.090

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
Microsoft Outlook Personal Folder	application/vnd.ms-outlook	2	0	0.000	0.010	0.010
Microsoft Outlook Schedule	application/vnd.ms-outlook-schedule	3,110	3,110	0.050	0.000	0.090
Microsoft Outlook Sticky Note	application/vnd.ms-outlook-stickynote	4	4	0.000	0.000	0.000
Microsoft Outlook Task	application/vnd.ms-outlook-task	1	1	0.000	0.000	0.000
Microsoft Photo Editor Object	application/vnd.ms-photo-editor	9,284	0	0.000	14.540	14.540
Microsoft PowerPoint Presentation	application/vnd.ms-powerpoint	35,772	35,772	78.970	78.970	78.970
Microsoft Precompiled Setup Information	application/vnd.ms-pnf	205	205	0.010	0.010	0.010
Microsoft Project File	application/vnd.ms-project	61	61	0.010	0.010	0.010
Microsoft Publisher File	application/vnd.ms-publisher	6	6	0.000	0.000	0.000
Microsoft Registry File	application/vnd.ms-registry	303	0	0.000	0.000	0.000
Microsoft Security Catalog	application/vnd.ms-pkiseccat	10,156	10,156	0.190	0.190	0.190
Microsoft Shortcut	application/vnd.ms-shortcut	351	351	0.000	0.000	0.000
Microsoft Transport Neutral Encapsulation Format File	application/vnd.ms-tnef	7	0	0.000	0.000	0.000
Microsoft Visio Drawing	application/vnd.ms-visio	5,271	148	0.110	2.740	2.740
Microsoft Windows Animated Cursor Image	image/vnd.ms-ani	12	12	0.010	0.010	0.010
Microsoft Windows Cursor Image	image/vnd.ms-windows-cursor	48	48	0.000	0.000	0.000
Microsoft Windows Delta Compression File	application/vnd.ms-windows-update-delta-compressed	26,201	26,201	0.020	0.020	0.020
Microsoft Windows Enhanced Metafile	image/vnd.ms-emf	66,553	67	0.010	15.330	15.330
Microsoft Windows Event Log (pre-Vista)	application/vnd.ms-windows-event-log	5	0	0.000	0.000	0.000
Microsoft Windows Help File	application/vnd.ms-windows-help	18	18	0.000	0.000	0.000
Microsoft Windows Icon Image	image/vnd.microsoft.icon	50	49	0.000	0.000	0.000
Microsoft Windows Mail Account	application/vnd.ms-windows-mail-account	6	0	0.000	0.000	0.000
Microsoft Windows Mail App Database	application/vnd.ms-windows-mail-db	1	0	0.000	0.010	0.010
Microsoft Windows Mail Contact	application/vnd.ms-windows-mail-contact	4	4	0.000	0.000	0.000
Microsoft Windows Mail Folder	application/vnd.ms-windows-mail-folder	73	0	0.000	0.000	0.000
Microsoft Windows Mail Message	application/vnd.ms-windows-mail-msg	273	273	0.000	0.000	0.000
Microsoft Windows Metafile	image/vnd.ms-wmf	136,941	265	0.030	41.590	41.590
Microsoft Windows Prefetch File	application/vnd.ms-windows-prefetch	200	200	0.010	0.010	0.010
Microsoft Windows Side-by-Side (SxS) Manifest File	application/vnd.ms-sxs-manifest+xml	4,633	4,633	0.020	0.020	0.020
Microsoft Windows SysMain Compressed File	application/vnd.ms-windows-sysmain-compressed	214	214	0.010	0.010	0.010
Microsoft Windows Vista and Windows 8 Event Log	application/vnd.ms-windows-event-logx	213	0	0.000	0.080	0.080
Microsoft Word Art	application/vnd.ms-word-art	69	0	0.000	0.000	0.000
Microsoft Word Document	application/vnd.ms-word	45,800	45,767	19.970	19.970	19.970

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
Microsoft Word Picture	application/vnd.ms-word-picture	5,504	0	0.000	0.480	0.480
Microsoft Word Pre-OLE2 Document	application/vnd.ms-word-pre-ole2	118	118	0.020	0.020	0.020
Microsoft Works Spreadsheet	application/vnd.ms-works-ss	6	6	0.000	0.000	0.000
Microsoft Works Word Processor Document	application/vnd.ms-works-wp	2	2	0.000	0.000	0.000
Microsoft XPS Document	application/vnd.ms-xpsdocument	6	6	0.000	0.000	0.000
Mobile Device Information	application/x-mobile-device-info	1	1	0.000	0.000	0.000
NTFS Index Record	filesystem/x-ntfs-index-record	4	4	0.000	0.000	0.000
NTFS LogFile	filesystem/x-ntfs-logfile	2	2	0.050	0.050	0.050
NTFS Master File Table	filesystem/x-ntfs-mft	4	4	0.140	0.140	0.140
NTFS UsnJrnl File	filesystem/x-ntfs-usnjournal	1	1	0.640	0.640	0.640
NTFS Volume Shadow Catalog	filesystem/x-ntfs-vss-catalog	1	1	0.000	0.000	0.000
NTFS Volume Shadow Store	filesystem/x-ntfs-vss-store	7	0	0.000	0.590	0.590
Native Language Support File	application/x-nls	678	678	0.060	0.060	0.060
NeXTSTEP/MacOS Property List	application/x-plist	1	1	0.000	0.000	0.000
Network Record	application/x-network	2	2	0.000	0.000	0.000
Nuix Evidence File	application/vnd.nuix-evidence	1	0	0.000	0.000	0.000
Nuix Log File	text/x-nuix-log	97	0	0.000	0.140	0.140
OpenDocument Spreadsheet	application/vnd.oasis.opendocument.spreadsheet	1	1	0.000	0.000	0.000
OpenType Font	application/vnd.ms-opentype	2	2	0.020	0.020	0.020
PCX Image	image/pcx	14	13	0.000	0.000	0.000
PKCS #7 MIME Encrypted	application/pkcs7-mime	1	1	0.000	0.000	0.000
PKCS #7 Signature	application/pkcs7-signature	4	4	0.000	0.000	0.000
PKCS #7 Signed Data	application/pkcs7-signed-data	4	4	0.000	0.000	0.000
Plain Text	text/plain	27,089	27,053	8.270	8.270	8.270
Portable Document Format	application/pdf	7,604	7,604	3.420	3.420	3.420
Portable Network Graphic	image/png	315,600	16,150	0.130	30.210	30.210
Postscript File	application/postscript	486	486	0.520	0.520	0.520
Quattro Pro Spreadsheet	application/vnd.corel-quattro	99	99	0.010	0.010	0.010
RAR Archive File	application/x-rar-compressed	12	0	0.000	0.080	0.080
RDF/XML Metadata File	application/rdf+xml	40	40	0.000	0.000	0.000
RFC822 Email Message	message/rfc822	3,762	3,762	0.020	0.010	0.020
RIFF WAVE Audio File	audio/wav	979	979	0.480	0.480	0.480
Rich Text Format	text/rtf	1,466	1,466	0.530	0.530	0.530
SQLite Database	application/vnd.sqlite-database	24	0	0.000	0.010	0.010
Scalable Vector Graphic	image/svg+xml	12	12	0.000	0.000	0.000
Self-Extracting Archive	application/x-self-extracting-archive	202	0	0.000	1.360	1.360
Setup API Windows 7 and 8 Boot Entry	application/vnd.ms-windows-setup-api-win7-win8-log-boot-entry	4	4	0.000	0.000	0.000
Setup API Windows 7 and 8 File	application/vnd.ms-windows-setup-api-win7-win8-log	3	3	0.000	0.000	0.000
Symantec Vault Stream	application/vnd.symantec-vault-stream-data	13	0	0.000	0.000	0.000
Tab Separated Values	text/tab-separated-values	184	184	0.100	0.100	0.100

Item type	MIME type	Item count	Total audited count	Total audited size (GB)	Total file size (GB)	Total digest input size (GB)
Tagged Image Format File	image/tiff	129	98	0.050	0.060	0.060
Targa Image File	image/tga	687	687	0.040	0.040	0.040
TrueType Font	application/x-font-ttf	629	624	0.330	0.330	0.330
TrueType Font Collection	application/x-font-ttc	38	38	0.450	0.450	0.450
UNIX/Linux ELF Executable	application/x-elf	6	6	0.020	0.020	0.020
Unknown Binary File	application/octet-stream	30,617	30,217	42.860	42.860	42.860
User Account Record	application/x-user-account	6	6	0.000	0.000	0.000
WOFF Font	application/x-font-woff	4	4	0.000	0.000	0.000
WebM Video File	video/webm	5	5	0.010	0.010	0.010
Windows Bitmap Graphic	image/bmp	19,070	877	0.130	4.240	4.240
Windows Dynamic Link Library	application/dll	28,580	28,580	9.520	9.520	9.520
Windows Executable	application/exe	4,703	4,702	1.470	1.470	1.470
Windows RegEdit File	text/x-windows-registry	4	4	0.000	0.000	0.000
Windows Thumbs DB File	application/x-thumbs-db	33	0	0.000	0.000	0.000
WordPerfect Document	application/vnd.corel-wordperfect	281	281	0.040	0.040	0.040
XSL Transformation File	application/xslt+xml	60	60	0.000	0.000	0.000
ZLIB Compressed File	application/zlib	7	0	0.000	0.000	0.000
ZLIB Compressed Stream	application/x-zlib-stream	105	0	0.000	0.010	0.010
Zip-Compressed File	application/x-zip-compressed	1,124	0	0.000	4.770	4.770
gzip-Compressed File	application/x-gzip	368	0	0.000	0.110	0.110
iCalendar Entry	text/calendar-entry	74	74	0.000	0.000	0.000
iCalendar File	text/calendar	99	0	0.000	0.000	0.000
tar Archive File	application/x-tar	3	0	0.000	0.020	0.020
text/xml	text/xml	401	401	0.000	0.000	0.000
vCalendar Data File	text/x-vcalendar	3	0	0.000	0.000	0.000
vCard Contact	text/vcard-contact	213	213	0.000	0.000	0.000
vCard File	text/vcard	213	0	0.000	0.000	0.000

APPENDIX G: WINDOWS TEST CPU UTILIZATION

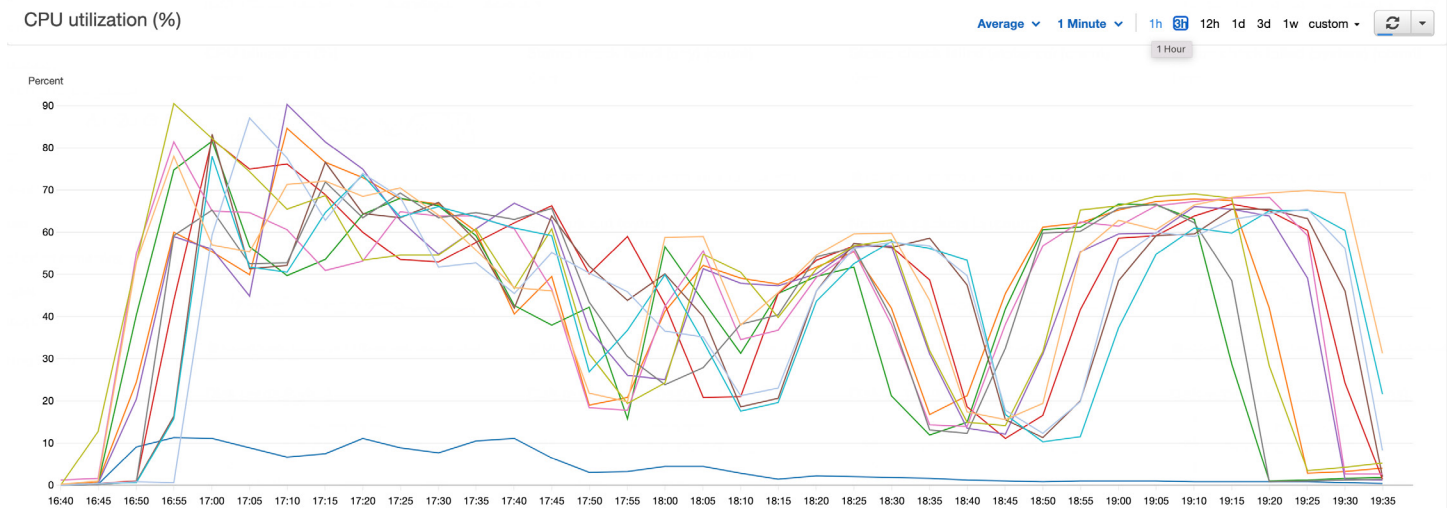


Figure 5: Nuix Core Engine REST CPU utilization (Windows with HCL Notes)

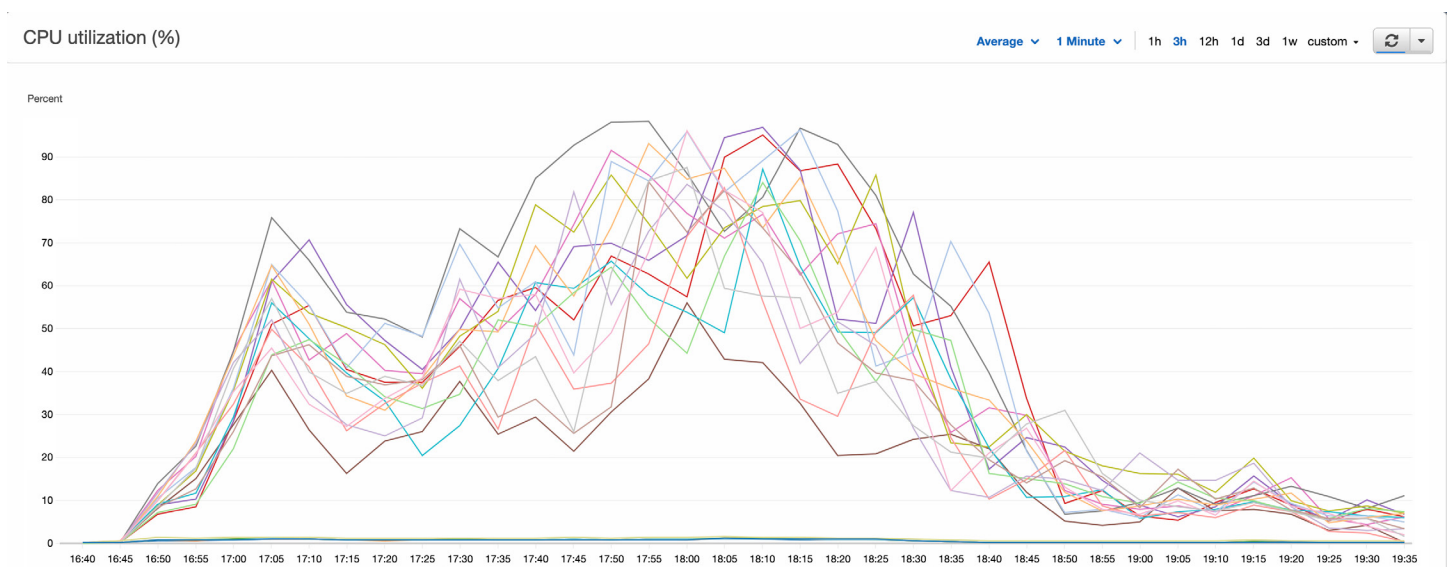


Figure 6: Elasticsearch nodes CPU utilization (Windows with HCL Notes)

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