

Search First Distributed Storage

Elasticsearch 🥰 minio



The plan

- Non bw-version of oneDrive
- Incredible search-speed
- Privacy
- Freedom!

Key Concept

- **Separation of concerns:**
 - Files → stored in object storage
 - Metadata → indexed in Elasticsearch
- **Enables:**
 - Fast filtering and full-text search
 - No need to scan large files directly

Search flow:

1. User searches via UI
2. Backend queries Elasticsearch
3. Matching metadata returned instantly
4. Corresponding files fetched from MinIO

Demonstration

SEARCH-FIRST DISTRIBUTED STORAGE

Files + Metadata Workspace

JWT auth with Elasticsearch metadata + MinIO object storage.

API
Ok
ES: ok | MinIO: ok

Upload File

Crash API Pod

Log out (alice)

Current folder: /

File

Browse... No file selected.

Display filename

Optional custom name

Tags (comma-separated)

invoice, tax, 2026

Upload file

Your Files

Batch Import

New Folder

Refresh

Root

Up

baur

Filter exact tag

Search

Clear

Created from

Created to

Sort by

Direction

dd / mm / yyyy

dd / mm / yyyy

Uploaded Date

Newest First

Apply Filters

Type	Name	Tags	Source Date	Size	Uploaded	
File	4 01-05-2026	hochzeit baur	01/05/2026, 15:20:59	1.1 MB	17/05/2026, 17:56:53	Download Delete
	14-09-07.bin					
	4 01-05-2026	burg				
	14-09-07.bin					

Architecture

- **Frontend:** uploading, searching, and managing files
- **Backend:** Node.js / Express
- **API Object Storage:** MinIO for file data
- **Search Engine:** Elasticsearch for metadata
- **Orchestration:** Kubernetes

JWT Advantages in Dsys

- No central auth-Service needed
- No state-sharing of services required
- Every request independent
- Easy load-balancing
- Revocation danger

Performance test local

TOTAL RESULTS

```
checks_total.....: 296    18.916173/s
checks_succeeded...: 80.74% 239 out of 296
checks_failed.....: 19.25% 57 out of 296
```

```
✓ login success
× upload status 201
  ↳ 80% - ✓ 237 / × 57
✓ crash endpoint accepted
```

CUSTOM

```
upload_errors.....: 57    3.642641/s
upload_latency_ms.....: avg=1220.131206 min=0      med=1131.1212 max=4346.227 p(90)=2234.8535 p(95)=2692.927735
```

HTTP

```
http_req_duration.....: avg=1.21s      min=0s      med=1.12s    max=4.34s    p(90)=2.23s    p(95)=2.69s
  { expected_response:true }...: avg=1.4s      min=14.05ms med=1.13s    max=4.34s    p(90)=2.67s    p(95)=2.69s
http_req_failed.....: 19.25% 57 out of 296
http_reqs.....: 296    18.916173/s
```

EXECUTION

```
iteration_duration.....: avg=1.23s      min=2.64ms  med=1.13s    max=4.59s    p(90)=2.27s    p(95)=2.72s
iterations.....: 295    18.852267/s
vus.....: 26    min=0      max=26
vus_max.....: 27    min=4      max=27
```

NETWORK

```
data_received.....: 215 kB 14 kB/s
data_sent.....: 552 MB 35 MB/s
```

Performance test kubernetes

TOTAL RESULTS

```
checks_total.....: 296      3.914899/s
checks_succeeded...: 91.89% 272 out of 296
checks_failed.....: 8.10%  24 out of 296
```

```
✓ login success
× upload status 201
  ↳ 91% - ✓ 270 / × 24
✓ crash endpoint accepted
```

CUSTOM

```
upload_errors.....: 24      0.317424/s
upload_latency_ms.....: avg=1371.996887 min=0      med=1151.29155 max=6729.3715 p(90)=2276.04814 p(95)=2946.401245
```

HTTP

```
http_req_duration.....: avg=1.36s      min=0s      med=1.15s      max=6.72s      p(90)=2.26s      p(95)=2.94s
  { expected_response:true }...: avg=1.4s      min=78.1ms  med=1.15s      max=6.72s      p(90)=2.4s      p(95)=2.94s
http_req_failed.....: 8.10%  24 out of 296
http_reqs.....: 296      3.914899/s
```

EXECUTION

```
iteration_duration.....: avg=1.78s      min=35.85ms med=1.15s      max=1m0s      p(90)=2.44s      p(95)=2.97s
iterations.....: 295      3.901673/s
vus.....: 2      min=0      max=26
vus_max.....: 27      min=21      max=27
```

NETWORK

```
data_received.....: 244 kB 3.2 kB/s
data_sent.....: 652 MB 8.6 MB/s
```

Learnings

- Auto-update
- Dockerization does not guarantee transferability

Tanks for your attention

