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[Exporter.Zipkin] Harden memory usage for endpoint caching and array tag serialization #7081

Merged [Kielek](#) merged 5 commits into [open-telemetry:main](#) from [Kielek:zipkin](#) 3 weeks ago[Conversation](#) 8 [Commits](#) 5 [Checks](#) 91 [Files changed](#) 8[Kielek](#) commented [3 weeks ago](#)Member

Fixes Codex/security findings

Changes

This change hardens Zipkin exporter memory behavior in two places:

1. Remote endpoint caching

- Replace the previous unbounded behavior with a **bounded LRU cache** for remote endpoints.
- Keep cache size fixed (`1024`) while preserving cache effectiveness for frequently used endpoint names.

2. Array tag serialization buffer retention

- Add a capacity guard for the thread-static JSON serialization stream used for array tags.
- If the stream grew beyond a threshold (`64 KiB`), recreate the stream/writer pair before reuse so oversized buffers are not retained indefinitely.
- **LRU cache size (`1024`)**: this is a defensive upper bound chosen to keep endpoint reuse effective for typical service topologies while preventing unbounded growth from high-cardinality or attacker-influenced values. The cache stores lightweight `ZipkinEndpoint` objects keyed by service name, so the cap keeps worst-case memory bounded and predictable per process.
- **Serializer retained buffer limit (`64 KiB`)**: this threshold is large enough to avoid churn for normal/small tag arrays, but small enough to avoid long-lived retention of very large thread-static buffers after an outlier serialization. If capacity exceeds this threshold, the stream/writer pair is reinitialized so unusually large allocations are not pinned to thread lifetime.

Merge requirement checklist

- ✓ [CONTRIBUTING](#) guidelines followed (license requirements, nullable enabled, static analysis, etc.)
- ✓ Unit tests added/updated
- ✓ Appropriate `CHANGELOG.md` files updated for non-trivial changes
- ~~[] Changes in public API reviewed (if applicable)~~

Kielek added 2 commits [3 weeks ago](#)

[Zipkin - avoid array tag serialization buffer retention](#) [fb318f7](#)

[Zipkin - avoid unbounded caches](#) ✓ [d97b360](#)

github-actions Bot added `pkg:OpenTelemetry.Exporter.Zipkin` `pkg:OpenTelemetry` labels [3 weeks ago](#)

[changelog](#) ✓ [0c69f19](#)

Kielek marked this pull request as ready for review [3 weeks ago](#)

Kielek requested a review from **a team** as a [code owner](#) [3 weeks ago](#)

Kielek commented [3 weeks ago](#) • edited ▾

Member Author

LRUCache utilize locking but it prevents memory from unconditional growth.
Considering fact that this package is reaching EOL in November it should be good enough solution.

1

codecov Bot commented [3 weeks ago](#) • edited ▾

Codecov Report

- ✓ All modified and coverable lines are covered by tests.
- ✓ Project coverage is 88.86%. Comparing base ([77665f0](#)) to head ([66e2ad7](#)).
- ⚠ Report is 3 commits behind head on main.
- ✓ All tests successful. No failed tests found.

▶ Additional details and impacted files

✓ **martincostello** approved these changes [3 weeks ago](#)

[View reviewed changes](#)

```
> src/OpenTelemetry.Exporter.Zipkin/Implementation/ZipkinEndpointLruCache.cs
```

⇅ Show resolved

```
> test/OpenTelemetry.Exporter.Zipkin.Tests/Implementation/ZipkinEndpointLruCacheTests.cs
```

⇅ Show resolved

✓ **rajkumar-rangaraj** approved these changes [3 weeks ago](#)

[View reviewed changes](#)

🔒 Merge branch 'main' into zipkin ✗ [9a01d5f](#)

🔗 **rajkumar-rangaraj** enabled auto-merge [3 weeks ago](#)

🔒 Merge branch 'main' into zipkin ✓ [66e2ad7](#)

🕒 **rajkumar-rangaraj** added this pull request to the [merge queue](#) [3 weeks ago](#)

🕒 **github-merge-queue** (Bot) removed this pull request from the [merge queue](#) due to failed status checks [3 weeks ago](#) [View details](#)

🕒 **Kielek** added this pull request to the [merge queue](#) [3 weeks ago](#)

🔗 Merged via the queue into [open-telemetry:main](#) with commit [c724f4b](#) [3 weeks ago](#) [View details](#)

85 checks passed

  **Kielek** deleted the `zipkin` branch 3 weeks ago

 This was referenced 18 hours ago

Squidex.Domain.Apps.Entities.Tests-1.0.0: 6 vulnerabilities (highest severity is: 7.5) [master] (reachable) amaybaum-prod/squidex-csharp-reach#35

 Open

opentelemetry.exporter.zipkin.1.9.0.nupkg: 2 vulnerabilities (highest severity is: 5.3) [master] (reachable) amaybaum-prod/squidex-csharp-reach#105

 Open

Squidex.Extensions-1.0.0: 6 vulnerabilities (highest severity is: 7.5) [master] (reachable) amaybaum-prod/squidex-csharp-reach#57

 Open

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Reviewers

-  **martincostello** 
-  **rajkumar-rangaraj** 

Assignees

No one assigned

Labels

- pkg:OpenTelemetry.Exporter.Zipkin
- pkg:OpenTelemetry

Projects

None yet

Milestone

No milestone

Development

Successfully merging this pull request may close these issues.

None yet

3 participants

