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#KubeCon #CloudNativeCon

OpenTelemetry Collector

Project updates



Who are we?



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The OpenTelemetry multitool



- open-telemetry/opentelemetry-collector (**#otel-collector**)
 - Core library
 - Key components
 - Builder
- open-telemetry/opentelemetry-collector-contrib
 - Many many many lovely components
- open-telemetry/opentelemetry-collector-releases
 - Binaries
 - Containers
 - Packages



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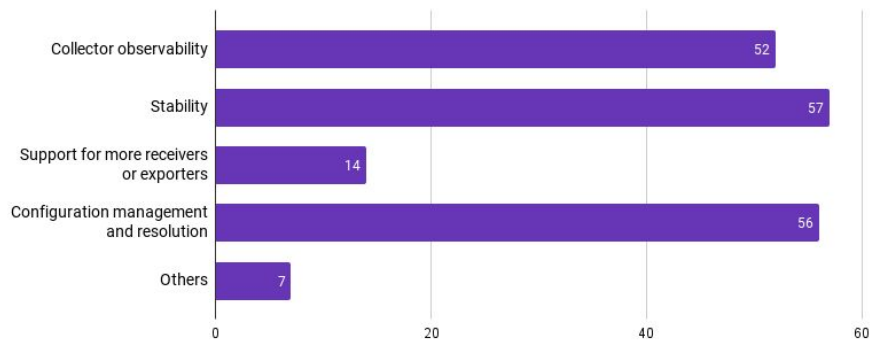


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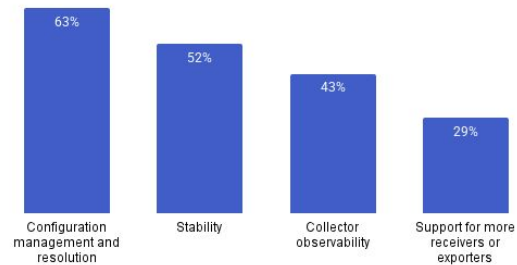
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What kind of improvement would you most like to see for the Collector?

186 responses



Collector Improvement request



Session Results: Roadmap Session

Participants: 89 | Points per person: 10 | Total points cast: 693

#	Idea	Points	%
1	OpenTelemetry Browser Support	54	8%
2	Collector Stability (v1)	51	7%
3	Entities	45	6%
4	Semantic Convention 1.0	42	6%
5	Otel unplugged 2027	40	6%
6	Prepare for better JS ESM Support	34	5%
7	Prometheus experience	33	5%



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Stabilization efforts

Not enough cooks

Collector 1.0



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Working to release a 1.0 Collector distro

- Stable APIs for component authors (25 modules stabilized)
- Stable configuration

Stable by default - Graduation recommendations

- Small set of stable components covering core use cases
 - configuration
 - benchmarks
 - ownership
 - documentation

High priority components



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We want these components to be stable ([#9375](#), [#44310](#)):

- `otlp` receiver
- `otlp_grpc` / `otlp_http` exporters
- `prometheus` receiver
- `transform` processor
- `host_metrics` receiver
- `k8s_attributes` processor
- `resource_detection` processor
- `file_log` receiver
- `filter` processor

Kubernetes in the Collector



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Most efforts point toward stabilization ([#44483](#))

- Aligning the k8s attributes processor with OTel SemConv ([just declared RC](#))
 - See the [processor readme](#) for more
- Performance improvements: expect ~20% memory reduction in v0.147.0+
- Kubelet stats receiver and k8s cluster receiver SemConv alignment to follow

New developments

- Leader election extension is now available
- K8s events receiver will not be deprecated

Prometheus in the Collector



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Stabilization is the main theme

- Prometheus receiver working toward stabilization
- Configuring the Collector's Prometheus endpoint will stabilize soon

New additions

- Metric start time processor now required to set start timestamps
- New component: Prometheus remote write receiver
- Prometheus team is working on an exporter-to-component bridge

OTTL in the Collector



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Stabilization

- Transform processor and OTTL are now beta
- Inferred context: simplified configuration in the transform and filter processors

What's new

- Routing connector: new features for advanced routing
- New functions in the OTTL standard library and in the transform processor
- New paths for request context data, span flags, etc.
- Misc: various performance improvements

Batch processor deprecation



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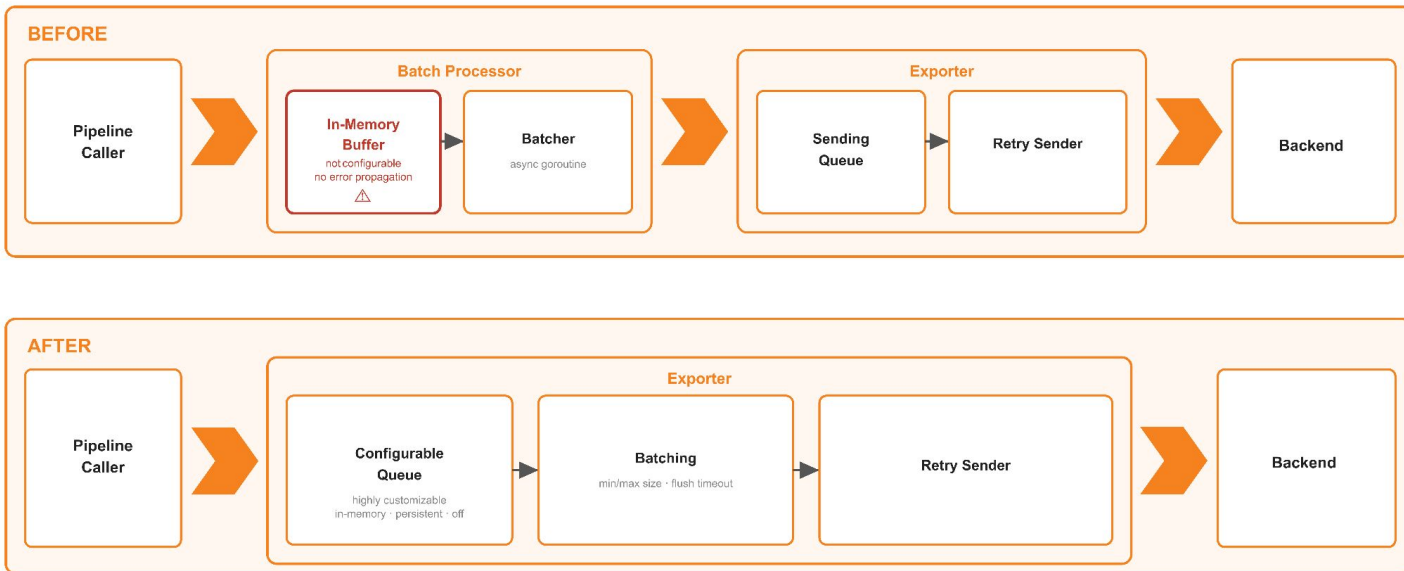


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Why Deprecated?

- The batch processor doesn't propagate the backpressure → on exporter queue overflow
- Exporter batching is built in the queue/retry logic → backpressure is propagated back to the caller



Batch processor deprecation



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Required configuration changes:

```
processors:
  batch:
    timeout: 200ms
    send_batch_size: 8192
    send_batch_max_size: 16384
exporters:
  otlp:
    endpoint: example.com:4317
    sending_queue:
      queue_size: 1000 # batches
service:
  pipelines:
    metrics:
      processors: [batch]
      exporters: [otlp]
```



```
exporters:
  otlp:
    endpoint: example.com:4317
    sending_queue:
      sizer: items # can be "bytes"
      queue_size: 10000 # items, not batches
      batch:
        flush_timeout: 200ms
        min_size: 8192
        max_size: 16384
service:
  pipelines:
    metrics:
      exporters: [otlp]
```



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Improvements to the Collector

Improvements to serialization performance in pdata module



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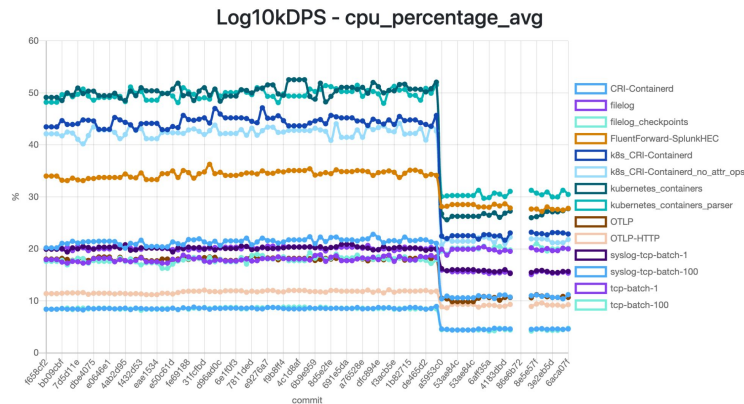
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- **Custom serialization:**
 - cmd/pdatagen now generates serialization code in addition to pdata
 - No dependency on the abandoned gogoproto library
- **Pdata memory pooling**
- **Other improvements:** eliminated interface overhead, struct field alignment.

Measured performance improvements:

- $\geq 40\%$ reduction in number allocations
- Binary size reduction: -1.54 MB



Improvements to internal telemetry



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Pipeline Component Telemetry RFC (Nov 2024)

- Universal component attributes (Mar 2025)
- Universal pipeline metrics (May 2025)
- Universal pipeline error logs (Aug 2025)
- 🤔 Stabilizing pipeline metrics and deprecating old redundant metrics?
- 🤔 Universal pipeline spans?

If interested, try out the **telemetry.newPipelineTelemetry** feature gate and give us feedback!

(**Note:** Requires a backend/exporter that supports instrumentation scope attributes)

Improvements to internal telemetry



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Other changes to internal telemetry

- Easier toggling of internal metrics
 - Custom metric views (Mar 2025)
 - 🤔 Specifying metric levels at the component level?
- Allowing custom Collector builds to customize the internal telemetry pipeline (different OTel SDK with different configuration, etc.)
- 🤔 Renaming metrics to fit OTel conventions?
(`ns.my_metric` instead of `ns_my_metric`)



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New concept: Entities



Entities overview



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Entities in OpenTelemetry

An Entity is a typed object associated with telemetry, with stable identity and description.

Why Entities

- Separates identity from descriptive metadata
- Lets one Resource represent multiple related things, not just a flat bag of attributes
- Makes relationships clearer across service, process, container, pod, host, etc.

Examples

- process
- container
- k8s.pod
- host

Entities support in Collector

Entity References in Resource

Resources now carry entity references, metadata that explicitly maps resource attributes to typed entities, separating identifying attributes from descriptive ones.

Entity Events

Entity events are special events sent as log that communicate:

- entity lifecycle updates;
- entity relationships (planned);
- complex and verbose entity attributes.

Both types of the entity information are emitted by ***k8s_cluster*** receiver as an experimental feature.



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New signal: Profiles



Profiles



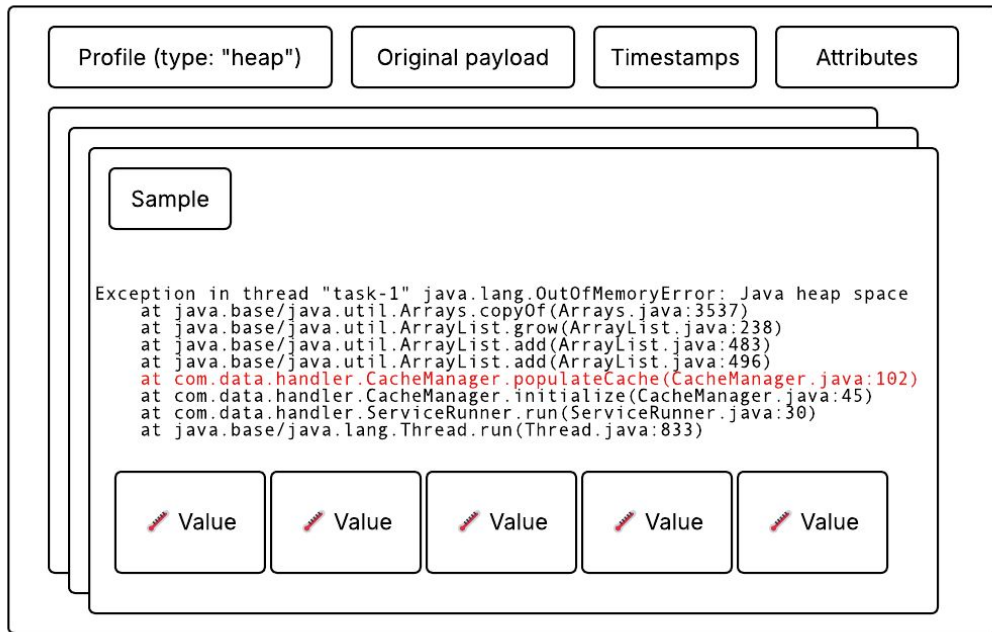
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- opentelemetry-proto 1.10 release
- Intensive work to support profiles with processors
- pprofreceiver
 - The collector can report its own profiles!
 - The collector can scrape pprof files or a pprof endpoint
- eBPF profiler - more in distributions





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Components



Saying hello to new friends



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Receivers

- `cisco_os` (v0.148.0)
- `macos_unified_logging` (v0.142.0)
- `systemd` (v0.142.0)
- `yang_grpc` (v0.142.0)
- `gitlab` (v0.139.0)
- `prometheus_remote_write` (v0.131.0)
- `faro` (v0.127.0)
- `stef` (v0.127.0)
- `pprof` (v0.148.0)

Exporters

- `google_cloud_storage` (v0.140.1)
- `tinybird` (v0.131.0)
- `faro` (v0.127.0)
- `azure_blob` (v0.124.0)
- `stef` (v0.127.0)

Processors

- `unroll` (v0.138.0)
- `coralogix` (v0.130.0)
- `metric_start_time` (v0.127.0)

Extensions

- `aws_logs_encoding` (v0.130.0)
- `google_cloud_logentry_encoding` (v0.129.0)
- `azure_auth` (v0.125.0)
- `k8s_leader_elector` (v0.126.0)
- `cgroup_runtime` (v0.133.0)
- `googlesecretmanagerprovider` (v0.127.0)

And goodbye to old ones



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- **bigip** receiver (v0.146.1)
- **carbon** exporter (v0.141.0)
- **ecstask** observer (v0.139.0)
- **opencensus** exporter & receiver (v0.132.0)
- **loki** exporter (v0.131.0)



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Collector distributions

New Collector distribution



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OTelCol eBPF Profiler

Includes:

- The [eBPF profiler receiver](#)
- A selection of other components from Core and Contrib:
 - **Processors:**
K8s attributes, Resource detection, Resource, Transform, Batch, Memory limiter
 - **Exporters:**
OTLP/gRPC, OTLP/HTTP, Debug, Nop, File
 - **Extensions:**
OpAMP, PProf, Health check

Build your own distribution



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Moving away from the “everything in Contrib” model → more components outside of official repos/distros

Try building your own distro with the **OpenTelemetry Collector Builder today!**

Advantages over Contrib:

- Smaller binary sizes
- Lower memory footprint
- Fewer compromisable dependencies
- Integrate components from any vendor

Disadvantages:

- More work (but easily automated)
- Ergonomics could be better, please give us feedback
- Picking compatible versions is complicated before stabilization





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Questions?

Or reach out to us on Slack!

Leave feedback on Sched:

