CDEvents – an outlook from the Eiffel perspective

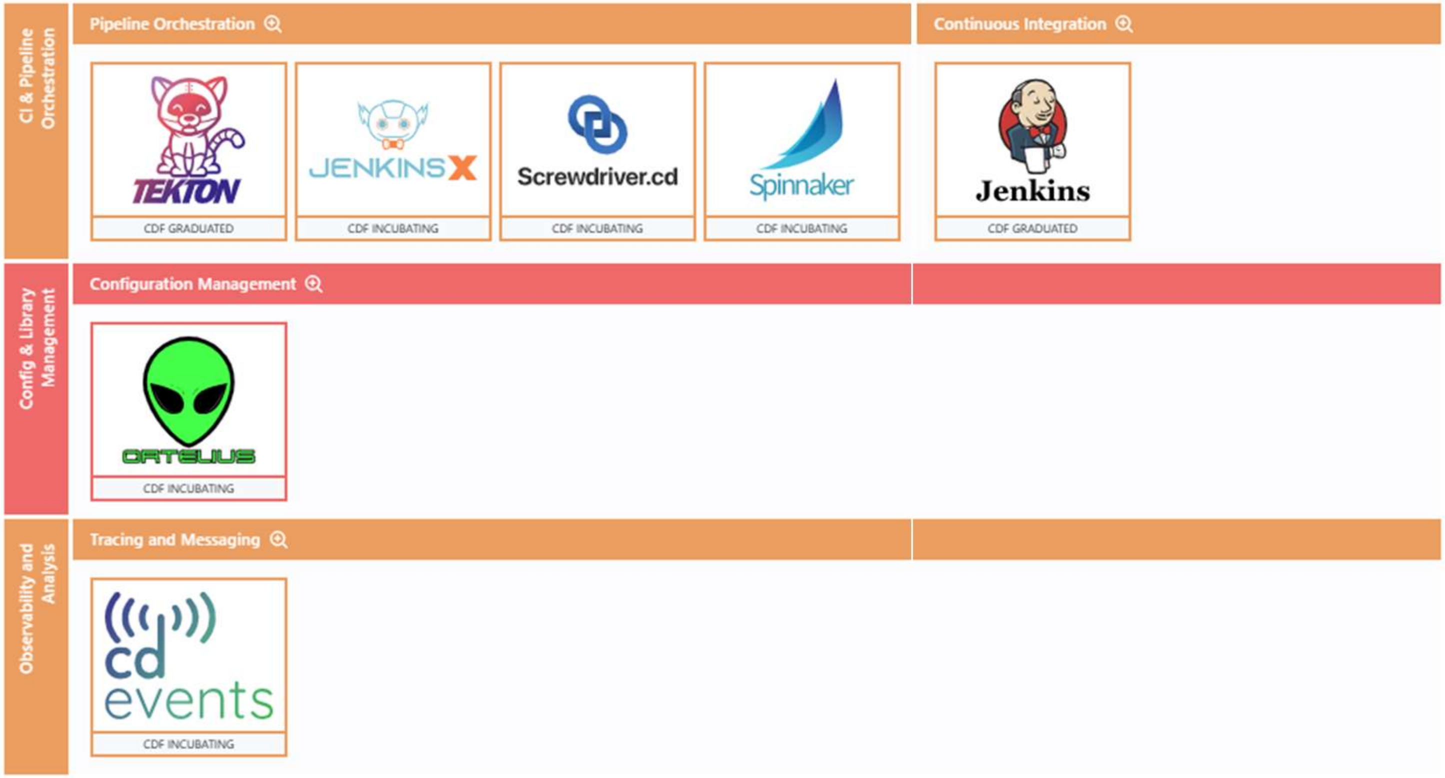
Agenda

- Hosting organization
- History and beginning
- CDEvents description
- Community & Ecosystem
- More information
- Questions

What is the CDF?

CD.FOUNDATION

- Continuous Delivery Foundation is an open source community improving the world's ability to deliver software with security and speed.
- Part of the Linux Foundation umbrella
  - CNCF – Cloud Native Computing Foundation is a sister organization
    - The CNCF believes most CD-related tooling is out of scope and broader than their focused cloud native definition, which is focused on containerization, microservices, service meshes, and orchestration – CDF FAQ



CI & Pipeline Orchestration

Pipeline Orchestration

- TEKTON: CDF GRADUATED
- JENKINS X: CDF INCUBATING
- Screwdriver.cd: CDF INCUBATING
- Spinnaker: CDF INCUBATING

Continuous Integration

- Jenkins: CDF GRADUATED

Config & Library Management

Configuration Management

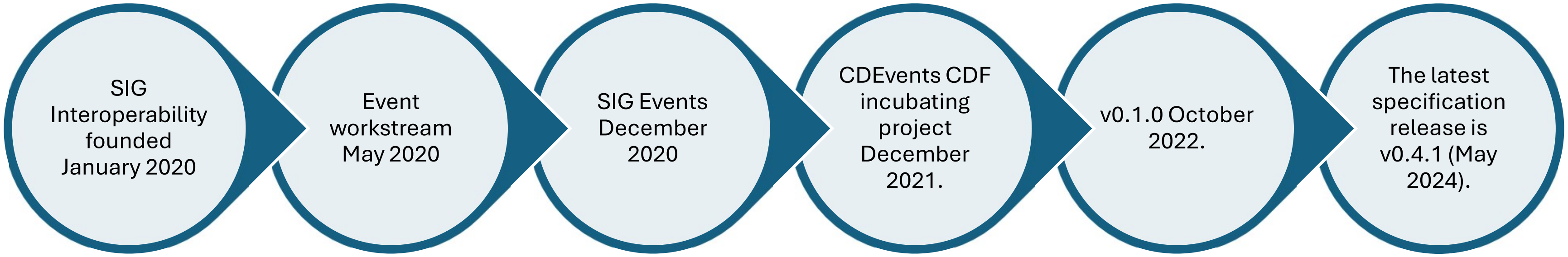
- ORTELIUS: CDF INCUBATING

Observability and Analysis

Tracing and Messaging

- cd events: CDF INCUBATING

History



SIG Interoperability founded January 2020

Event workstream May 2020

- From SIG Interoperability

SIG Events December 2020

- From Events Workstream

CDEvents CDF incubating project December 2021.

v0.1.0 October 2022.

The latest specification release is v0.4.1 (May 2024).

Why was CDEvents started

Getting traction from other players	
Native support in Jenkins, Argo etc	
A platform to discuss event driven system without a set event protocol	More important that we got an event driven system than people used Eiffel
Get interest from developers of the other systems	
Resistance against Eiffel as it comes from Ericsson	Cloud “is so different”
Hope of closer cooperation/relationship with Eiffel	It never came
Have encountered other “event protocols” Linux Fedora	

Key Concepts

Uses CloudEvents as transportation

Links can be included in the events or handled separately

Reverse DNS as naming convention

CDEvents uses a hierarchical naming pattern:
dev.cdevents.<subject>.<predicate>.<version>

Subject / predicate

No sync between markdown and schemas

Event overview

Category	Subject	Predicate
Core	pipelineRun taskRun	queued, started, finished started, finished
Source Code	repository branch change	created, modified, deleted created, deleted created, reviewed, merged, abandoned, updated
CI	build artifact	queued, started, finished, packaged, published, signed, downloaded, deleted
CD	environment service	created, modified, deleted deployed, upgraded, rolledback, removed, published
Testing	testCaseRun testSuiteRun testOutput	queued, started, finished, skipped queued, started, finished published
Operations	incident ticket	detected, reported, resolved created, updated, closed

Event overview

Category	Subject	Predicate
Core		
Source Code		
CI		
CD		
Testing		
Operations		

Similarities

Eiffel	CDEvents
Activity	pipelineRun taskRun build

Similarities

Eiffel	CDEvents
Activity	pipelineRun taskRun build
Artifact	artifact
Test	testCaseRun testSuiteRun
Source Change	Change
Issue	Ticket

Differences

Eiffel	CDEvents
Composition	
Flow context (Somewhat included in subject)	
Confidence level	
Announcement	

Differences

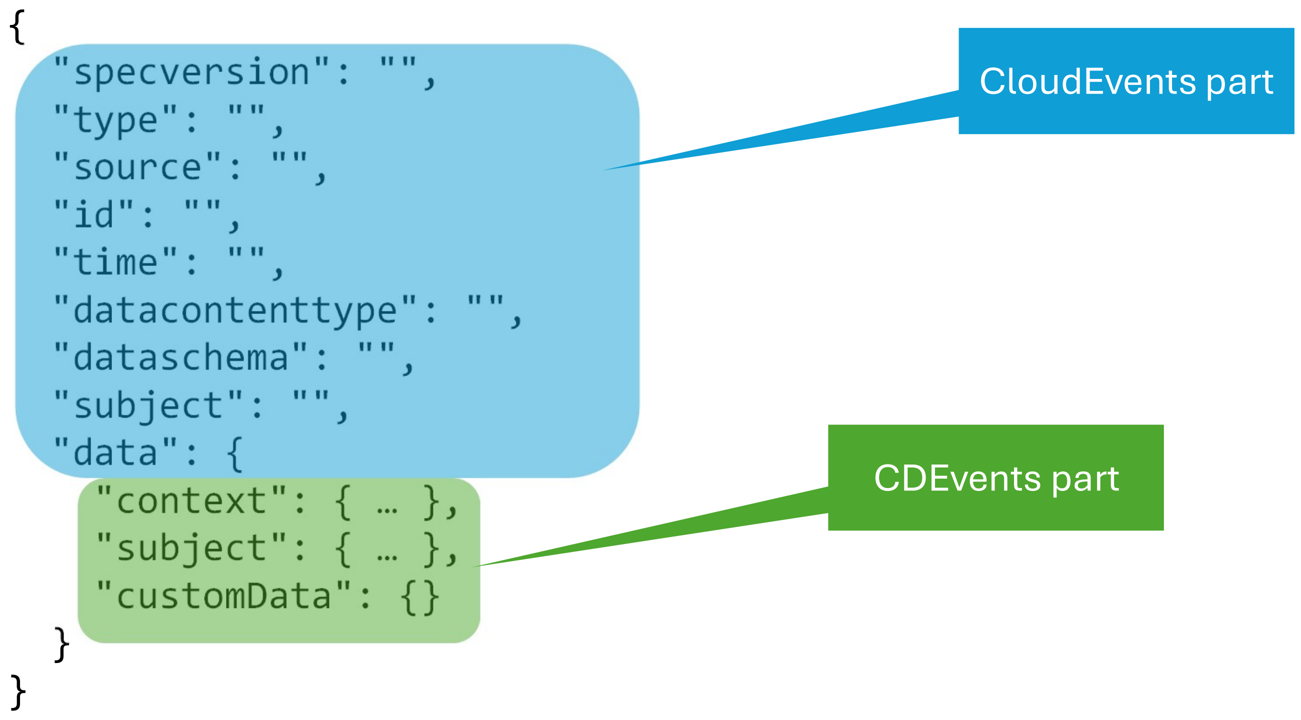
Eiffel	CDEvents
Composition	
Flow context (Somewhat included in subject)	
Confidence level	
Announcement	
	Repository Branch
	Service (Eiffel has Artifact deployed)
	Test output
	Incident

Naming

Event Type Naming Convention

- Format: dev.cdevents.<subject>.<predicate>.<version>
- Examples:
  - dev.cdevents.pipeline.started.0.1.0
  - dev.cdevents.build.finished.0.1.0
  - dev.cdevents.artifact.published.0.1.0

Structure

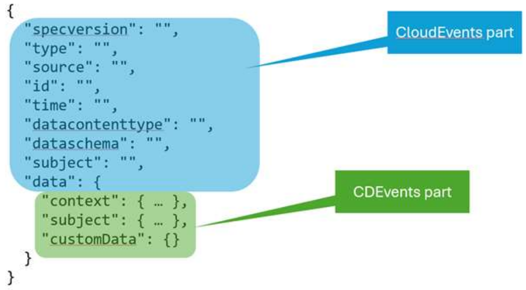


```
{
  "specversion": "",
  "type": "",
  "source": "",
  "id": "",
  "time": "",
  "datacontenttype": "",
  "dataschema": "",
  "subject": "",
  "data": {
    "context": { … },
    "subject": { … },
    "customData": {}
  }
}
```

CloudEvents part

CDEvents part

Full example



```
{
  "specversion": "",
  "type": "",
  "source": "",
  "id": "",
  "time": "",
  "datacontenttype": "",
  "dataschema": "",
  "subject": "",
  "data": {
    "context": { … },
    "subject": { … },
    "customData": {}
  }
}
```

```
{
  "specversion": "1.0",
  "type": "dev.cdevents.pipelinerun.started.0.1.1",
  "source": "/dev/pipeline/myproject",
  "id": "pipeline-run-12345-started",
  "time": "2025-07-30T10:30:00Z",
  "datacontenttype": "application/json",
  "dataschema": “…/spec/v0.4.1/schemas/pipelinerunstarted.json",
  "subject": "myproject/pipeline/main-build/run/12345",
  "data": {
    "context": {
      "version": "0.4.1",
      "id": "pipeline-run-12345-started",
      "source": "/dev/pipeline/myproject",
      "type": "dev.cdevents.pipelinerun.started.0.1.1",
      "timestamp": "2025-07-30T10:30:00Z"
    },
    "subject": {
      "id": "myproject/pipeline/main-build/run/12345",
      "source": "/dev/pipeline/myproject",
      "type": "pipelineRun",
      "content": {
        "pipelineName": "main-build",
        "url": “…/pipeline/myproject/main-build/run/12345",
        "outcome": null,
        "errors": null
      }
    },
    "customData": {
      "buildNumber": "12345",
      "branch": "main",
      "commit": "abc123def456",
      "triggeredBy": "webhook",
      "environment": "staging"
    }
  }
}
```

Meta

Data

Links - Terms

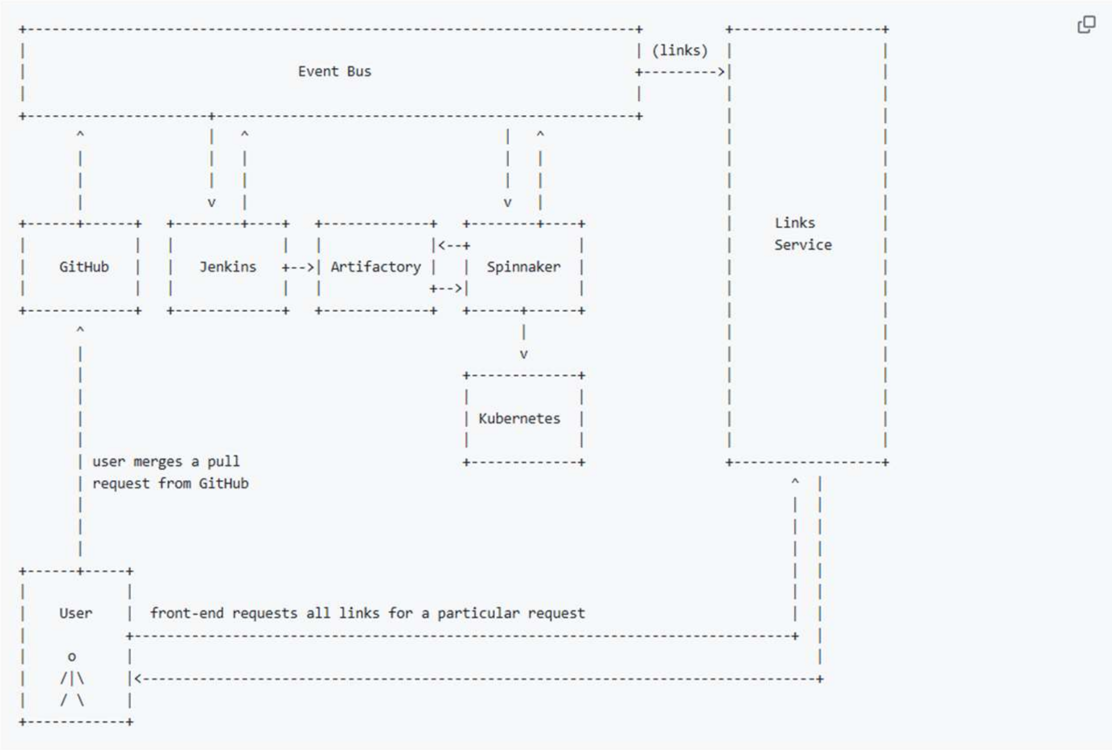
- Link: Relation between events.
- Chain: End-to-end CI/CD lifecycle representation.

Purposefully not diving deep into the subject as this might not be interesting for most of the participants

```
{
  "context": {
    "version": "0.2.0",
    "id": "abcd-1234",
    "source": "https://github.com/example/repo/pull/123",
    "type": "dev.cdevents.change.merged.0.2.0",
    "timestamp": "2025-07-02T14:30:00Z",
    "schemaUri": "https://cdevents.dev/0.4.1/schema/change-merged-event",
    "chainId": "chain-5678",
…
}
```

Link handling

- Internal Links
  - As Eiffel
  - Sender must know the link logic
- External Links
  - Another service has the logic
  - https://github.com/cdevents/spec/pull/139 has the full details



```
+--------------------------------------------------------------------------+          +------------------+
|                                                                          | (links)  |                  |
|                                 Event Bus                                +--------->|                  |
|                                                                          |          |                  |
+----------------------+---------------------------------------------------+          |                  |
       ^               |   ^                               |   ^                      |                  |
       |               |   |                               |   |                      |                  |
       |               |   |                               |   |                      |                  |
       |               v   |                               v   |                      |                  |
+------+------+   +--------+----+   +-------------+   +--------+----+                 |     Links        |
|             |   |             |   |             |<--+             |                 |     Service      |
|    GitHub   |   |   Jenkins   +-->| Artifactory |   |  Spinnaker  |                 |                  |
|             |   |             |   |             +-->|             |                 |                  |
+-------------+   +-------------+   +-------------+   +------+------+                 |                  |
       ^                                                     |                        |                  |
       |                                                     v                        |                  |
       |                                              +-------------+                 |                  |
       |                                              |             |                 |                  |
       |                                              | Kubernetes  |                 |                  |
       |                                              |             |                 |                  |
       | user merges a pull                           +-------------+                 +------------------+
       | request from GitHub                                                                  ^  |
       |                                                                                      |  |
       |                                                                                      |  |
       |                                                                                      |  |
+------+-----+                                                                                |  |
|            |                                                                                |  |
|    User    |  front-end requests all links for a particular request                         |  |
|            +--------------------------------------------------------------------------------+  |
|     o      |                                                                                   |
|    /|\     |<----------------------------------------------------------------------------------+
|    / \     |
+------------+
```

Link types

- START: Marks chain start.
- END: Marks chain end.
- PATH: Shows event path (from/to).
- RELATION: Adds context (e.g., trigger).

I know that nothing more will happen – likely most relevant with External Service

Cause in Eiffel

Rest of Eiffel Link type

Example of links

A path link which is used to indicate a direct connection between two events

```
[
  {
    "link_type": "PATH",
    "from": {
      "context_id": “<event_id>"
    }
  }
]
```

A relation link where the `context_id` is was some trigger for this event

```
[
  {
    "link_type": "RELATION",
    "link_kind": ”<free text>",
    "target": {
      "context_id": "<event_id>"
    }
  }
]
```

An end link signaling the end of a chain

```
[
  {
    "link_type": "END",
    "from": {
      "context_id": "<event_id>"
    }
  }
]
```

Change Merged Example

```
{
  "context": {
    "version": "0.2.0",
    "id": "abcd-1234",
    "source": "https://github.com/example/repo/pull/123",
    "type": "dev.cdevents.change.merged.0.2.0",
    "timestamp": "2025-07-02T14:30:00Z",
    "schemaUri": "https://cdevents.dev/0.4.1/schema/change-merged-event",
    "chainId": "chain-5678",
  },
  "subject": {
    "id": "change-12345",
    "source": "https://github.com/example/repo",
    "type": "change",
    "content": {
      "repository": {
        "id": "repo-1",
        "source": "https://github.com/example/repo"
      }
    }
  },
}
```

Build started Exampel

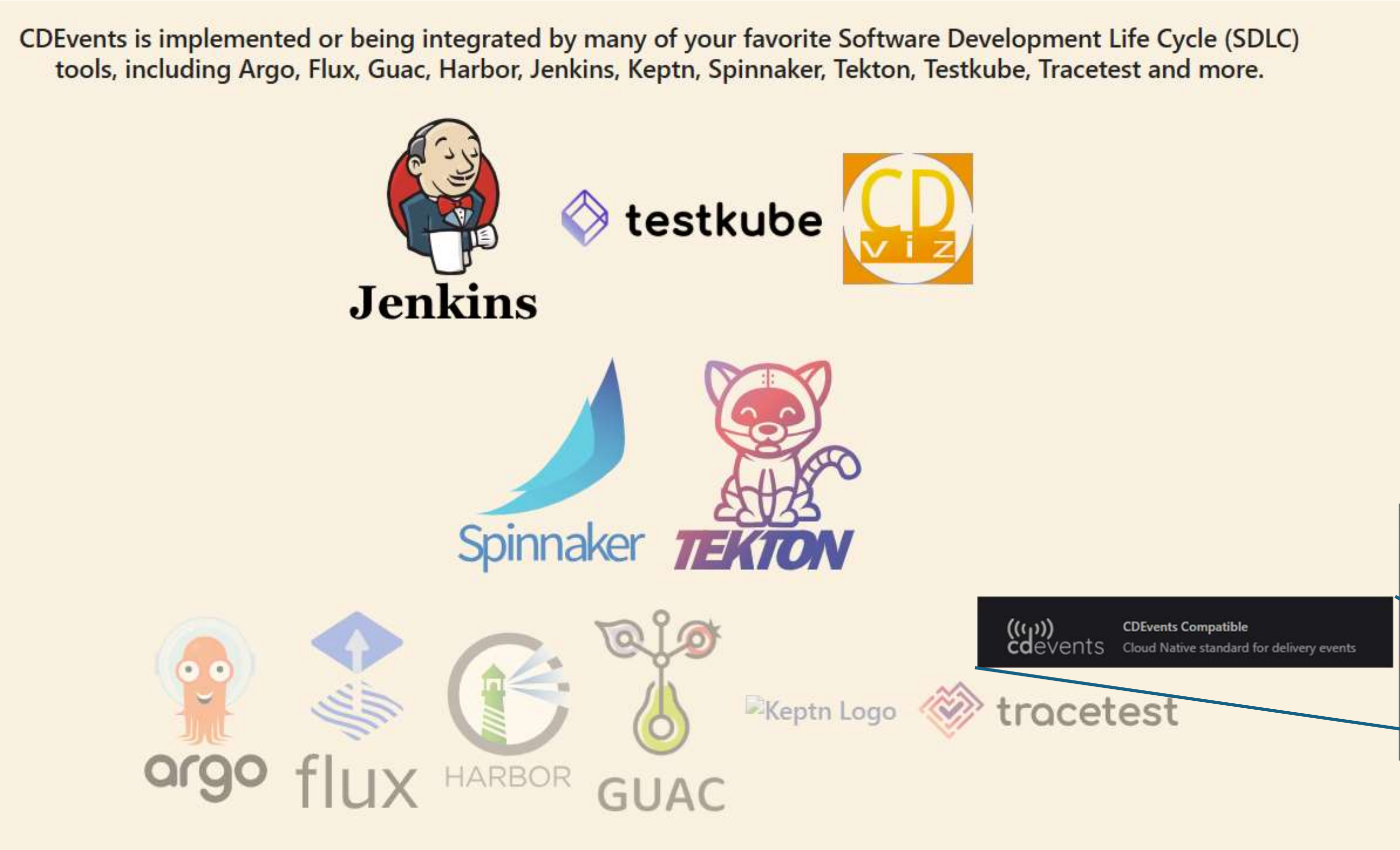
```
{
  "context": {
    "version": "0.2.0",
    "id": "build-1234",
    "source": "https://ci.example.com/buildstarted/123",
    "type": "dev.cdevents.build.started.0.2.0",
    "timestamp": "2025-07-02T14:45:00Z",
    "schemaUri": "https://cdevents.dev/0.4.1/schema/build-started-event",
    "chainId": "chain-5678",
    "links": [
             {
               "linkType": "RELATION",
               "linkKind": "related",
               "target": {
                          "contextId": "abcd-1234"
                }
            }
           ]

  },
  "subject": {
    "id": "build-5678",
    "source": "https://ci.example.com",
    "type": "build",
    "content": {}
  },
}
```

Ecosystem

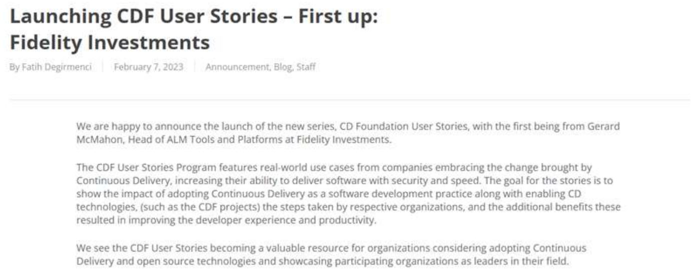
Unsure about stability and maintenance

- **Go:** https://github.com/cdevents/sdk-go
- **Java:** https://github.com/cdevents/sdk-java
- **Rust:** https://github.com/cdevents/sdk-rust
- **Jenkins Plugin:** https://plugins.jenkins.io/cdevents/
- **Python:** https://github.com/cdevents/sdk-python
- **Tekton**: https://github.com/tektoncd/experimental/tree/main/cloudevents (Archived)
- Webhook
- Gerrit Translator
- **C#:** An internal implementation exists, with plans to open-source it.
- **JavaScript:** An SDK is planned.
- **.NET:** An SDK is planned.

Users of CDEvents



CDEvents is implemented or being integrated by many of your favorite Software Development Life Cycle (SDLC) tools, including Argo, Flux, Guac, Harbor, Jenkins, Keptn, Spinnaker, Tekton, Testkube, Tracetest and more.



Launching CDF User Stories – First up: Fidelity Investments

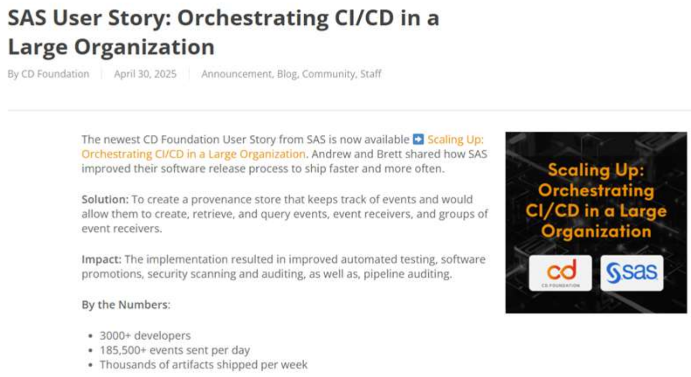
By Fatih Degirmenci | February 7, 2023 | Announcement, Blog, Staff

We are happy to announce the launch of the new series, CD Foundation User Stories, with the first being from Gerard McMahon, Head of ALM Tools and Platforms at Fidelity Investments.

The CDF User Stories Program features real-world use cases from companies embracing the change brought by Continuous Delivery, increasing their ability to deliver software with security and speed. The goal for the stories is to show the impact of adopting Continuous Delivery as a software development practice along with enabling CD technologies, (such as the CDF projects) the steps taken by respective organizations, and the additional benefits these resulted in improving the developer experience and productivity.

We see the CDF User Stories becoming a valuable resource for organizations considering adopting Continuous Delivery and open source technologies and showcasing participating organizations as leaders in their field.

https://cd.foundation/blog/2023/02/07/launching-cdf-user-stories-first-up-fidelity-investments/



SAS User Story: Orchestrating CI/CD in a Large Organization

By CD Foundation | April 30, 2025 | Announcement, Blog, Community, Staff

The newest CD Foundation User Story from SAS is now available ➡ Scaling Up: Orchestrating CI/CD in a Large Organization. Andrew and Brett shared how SAS improved their software release process to ship faster and more often.

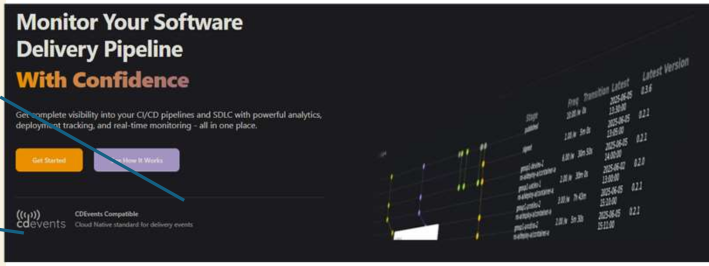
Solution: To create a provenance store that keeps track of events and would allow them to create, retrieve, and query events, event receivers, and groups of event receivers.

Impact: The implementation resulted in improved automated testing, software promotions, security scanning and auditing, as well as, pipeline auditing.

By the Numbers:

- 3000+ developers
- 185,500+ events sent per day
- Thousands of artifacts shipped per week

https://cd.foundation/blog/2025/04/30/sas-user-story/



Monitor Your Software Delivery Pipeline

With Confidence

Get complete visibility into your CI/CD pipelines and SDLC with powerful analytics, deployment tracking, and real-time monitoring - all in one place.

https://cdviz.dev/

Vitality

Meetings each week discussing protocol update and eco system improvements

Major contributing companies 2025 includes:

- Apple
- Alchim312/Cdviz
- IBM

Conference talks

- Mostly cdCon

Why not Ericsson?
Ericsson has not seen this important enough to put resource on since fall 2024

For more information

Official Resources:

- **Website:** cdevents.dev
- **GitHub Repository:** github.com/cdevents
- **Specification:** cdevents.dev/docs/spec

Community & Support:

- **Community page:** github.com/cdevents/community
  - **Contributing:** How to get involved
  - **Slack:** Join the #cdevents channel in the CDF Slack
  - **Mailing List:** cdevents-dev Google group

Questions?