Microservices Orchestration Survey
Introduction

In July 2018, Camunda ran its first-ever microservices orchestration survey. As microservices architectures have become more common, we’ve seen an increasing number of Camunda users building orchestration solutions with our BPMN Workflow Engine. And this move toward microservices is a large part of the reason we’re developing Zeebe, a next-generation workflow engine designed for high-throughput use cases such as microservices orchestration.

We organized this survey because we wanted to learn more about how companies are currently addressing the challenges that arise when end-to-end business processes span multiple microservices. We also wanted more insight into why organizations are adopting microservices in the first place and how they’re approaching these architectures – for many, a microservices architecture represents a significant change in how applications are built.

We’re happy to say that more than 350 respondents shared their input with us. The result is a rich set of data that helps to answer how and why organizations of all sizes are adopting microservices architectures and the tools they’re using to make it happen.

Thanks for taking a look at the results, and we hope you find these insights as helpful as we have.

Sincerely,
The Camunda Team
About Camunda

Camunda is a software company reinventing workflow automation. Hundreds of companies including 24 Hour Fitness, AT&T, Lufthansa Technik and Zalando trust Camunda to automate core business processes to the highest possible extent, allowing their businesses to scale and revenue to grow without proportionally increasing operating costs.

With its open source workflow automation and decision platform, Camunda provides detailed visibility into business operations across distributed systems, boosts system resilience and enables enterprises to overcome “big workflow” challenges resulting from digital transformation. One of the fastest growing companies in EMEA as ranked by Deloitte, Camunda is based in Berlin with offices in San Francisco and Denver, USA.

To learn more visit: camunda.com
## Key Findings

<table>
<thead>
<tr>
<th>Findings</th>
<th>Page</th>
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<tbody>
<tr>
<td>63% of respondents are using a microservices architecture in some or all of their applications.</td>
<td>Page 5</td>
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<tr>
<td>More than 60% or respondents cite <em>improved scalability of applications</em> and <em>faster time to market for new products and services</em> as key benefits of microservices.</td>
<td>Page 7</td>
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<tr>
<td>The two biggest challenges faced by respondents who use a microservices architecture are <em>lack of visibility into end-to-end processes that span multiple microservices</em> and <em>ambiguous error handling, leading to unaddressed errors at the boundaries between microservices</em>.</td>
<td>Page 9</td>
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<td>More than one third of respondents say their organization doesn’t have any uniform policies for monitoring microservices.</td>
<td>Page 10</td>
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<tr>
<td>88% of respondents are using REST APIs for communication between microservices, while fewer than half use Apache Kafka or other message queues.</td>
<td>Page 12</td>
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<tr>
<td>39% of respondents say their organization factors in the role of microservices in broader business processes yet does not explicitly model the business processes their microservices are a part of.</td>
<td>Page 14</td>
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<tr>
<td>64% of respondents say microservices are extremely important or very much important as a core enabling technology for digital transformation.</td>
<td>Page 18</td>
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</table>
Is your organization currently using a microservices architecture?

18% Yes, all of the applications we build use a microservices architecture.

46% Yes, some of the applications we build use a microservices architecture.

28% No, the applications we build do not use on a microservices architecture, but we’re considering microservices.

7% No, the applications we build do not use a microservices architecture, and we do not plan to use microservices.

1% Other

Sample Size: 354 (All Respondents)
From respondents who will not use a microservices architecture: why has your organization decided not to adopt microservices?

- 43% A microservices architecture would introduce unnecessary complexity to our engineering org; the tradeoffs aren’t worth it.
- 39% A microservices architecture isn’t the right fit for our use cases.
- 17% We’d like to migrate to a microservices architecture, but given the size and complexity of our applications, it would be unrealistic to do so.
- 22% It’s too difficult to hire developers with experience working in a microservices architecture.
- 9% Operations and monitoring are straightforward in our current architecture; we don’t want to transition to a DevOps model.

Sample Size: 23 (6% of Respondents)
Why did your engineering organization adopt / is planning to adopt a microservices architecture?

- **64%** Improved scalability of applications
- **60%** Faster time to market for new products and services
- **54%** To support my organization's digital transformation efforts and to power next-generation applications
- **54%** Development teams have more autonomy, e.g. the ability to choose their own technology stack
- **50%** Increased application resilience
- **33%** Easier application maintenance and debugging
- **2%** Other

Sample Size: 204 (58% of Respondents)
What business benefits does your organization see / expect to see as a result of adopting a microservices architecture?

- Improved employee efficiency: 40%
- Improved customer / end user experience: 22%
- Cost savings on infrastructure and other development tools: 9%
- Increased revenue: 58%
- Other:

Sample Size: 197 (56% of Respondents)
What challenges does your organization face / expect to face with a microservices architecture?

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Challenge</th>
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</thead>
<tbody>
<tr>
<td>59%</td>
<td>Lack of visibility into end-to-end business processes that span multiple microservices</td>
</tr>
<tr>
<td>50%</td>
<td>Ambiguous error handling, leading to unaddressed errors at the boundaries between microservices</td>
</tr>
<tr>
<td>46%</td>
<td>Cross-team communication amongst teams working on different microservices</td>
</tr>
<tr>
<td>38%</td>
<td>Complexity of supporting services written in many different programming languages / using different data stores</td>
</tr>
<tr>
<td>35%</td>
<td>Difficulty hiring developers who have the right skill set</td>
</tr>
<tr>
<td>30%</td>
<td>Security issues due to a large number of services</td>
</tr>
<tr>
<td>8%</td>
<td>Other</td>
</tr>
</tbody>
</table>

Sample Size: 202 (57% of Respondents)
How does your organization handle monitoring for individual microservices?

My organization uses a company-wide set of monitoring tools that are configured so that each team can see metrics and logging for its microservice only.

My organization doesn't have any uniform policies for monitoring microservices.

Every team working on a microservice is required to choose and implement its own tools for metrics and logging.

Other

Sample Size: 201 (57% of Respondents)
How does your organization handle errors within a business process that occur at the boundary of 2 or more microservices?

We don’t have a uniform approach for handling errors at microservice boundaries.

Every team working on a microservice is required to build error-handling into its microservice; eventually, the microservice where the error occurred will perform a retry.

The teams working on the affected microservices will coordinate to resolve errors on an ad hoc basis.

Other

Sample Size: 191 (54% of Respondents)
We use / plan to use the following tools for communication between microservices:

- **88%** REST API
- **46%** Apache Kafka
- **30%** RabbitMQ
- **21%** Apache ActiveMQ
- **11%** Other
- **6%** Confluent Platform
- **6%** Amazon Kinesis
- **0%** Apache Pulsar

Sample Size: 198 (56% of Respondents)
How many distinct microservices does your organization run in production / plan to run in production?

16% 1-9
26% 10-19
32% 20-49
11% 50-99
15% 100 or more

Sample Size: 171 (48% of Respondents)
Does your organization factor in the role of microservices in broader business processes or workflows?

- Yes, and we explicitly document the business processes that our microservices are a part of: 45%
- Yes, but we don't explicitly document the business processes that our microservices are a part of: 39%
- No, we don't consider microservices to be part of broader business processes or workflows: 11%
- Other: 5%

Sample Size: 194 (55% of Respondents)
An end-to-end business process (for example, an e-commerce company fulfilling a customer order) will often span many different microservices. In your organization or team, how many different business processes rely on microservices to carry out tasks?

- 28%: 1-5
- 24%: 6-9
- 16%: 10-19
- 14%: 20-49
- 15%: 50 or more
- 3%: Other

Sample Size: 152 (43% of Respondents)
We use / plan to use the following for visibility into end-to-end business processes and microservices orchestration:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Tool Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>69%</td>
<td>Camunda BPM</td>
</tr>
<tr>
<td>17%</td>
<td>Custom tool built inside our organization</td>
</tr>
<tr>
<td>16%</td>
<td>Zeebe</td>
</tr>
<tr>
<td>14%</td>
<td>We don’t use or plan to use a tool for process visibility and orchestration</td>
</tr>
<tr>
<td>7%</td>
<td>AWS Step Functions</td>
</tr>
<tr>
<td>6%</td>
<td>Apache Airflow</td>
</tr>
<tr>
<td>3%</td>
<td>Conductor</td>
</tr>
<tr>
<td>2%</td>
<td>Google Cloud Composer</td>
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<tr>
<td>1%</td>
<td>Cadence</td>
</tr>
<tr>
<td>12%</td>
<td>Other</td>
</tr>
</tbody>
</table>

Sample Size: 188 (53% of Respondents)
How important is digital transformation for long-term success in your industry?

- 50% Extremely important
- 41% Very important
- 8% Moderately important
- 1% Slightly important
- 0% Not at all important

Sample Size: 199 (56% of Respondents)
How important are microservices as a core enabling technology for digital transformation?

- 19% Extremely important
- 45% Very much important
- 28% Moderately important
- 5% Slightly important
- 4% Not at all important

Sample Size: 196 (55% of Respondents)
Where are your applications deployed at your organization?

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Deployment Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>77%</td>
<td>On-premises hardware</td>
</tr>
<tr>
<td>27%</td>
<td>Cloud: Amazon Web Services</td>
</tr>
<tr>
<td>19%</td>
<td>Cloud: Microsoft Azure</td>
</tr>
<tr>
<td>7%</td>
<td>Cloud: Google Cloud Platform</td>
</tr>
<tr>
<td>4%</td>
<td>I don’t know</td>
</tr>
<tr>
<td>1%</td>
<td>Cloud: IBM</td>
</tr>
<tr>
<td>7%</td>
<td>Other</td>
</tr>
</tbody>
</table>

Sample Size: 201 (57% of Respondents)
My organization uses the following resource managers or container orchestrators in the cluster where our applications are deployed:

- Kubernetes: 41%
- We don't use a resource manager: 23%
- Docker Swarm: 20%
- I don't know: 15%
- Apache Mesos: 4%
- DC/OS: 3%
- Other: 17%

Sample Size: 197 (56% of Respondents)
In which programming languages does your organization build its applications?

- **89%**: Java
- **60%**: JavaScript
- **25%**: C#
- **25%**: Python
- **23%**: .NET
- **6%**: Go
- **5%**: Ruby
- **16%**: Other

Sample Size: 200 (56% of Respondents)
What best describes Camunda at your organization?

- **33%** We’re using Camunda in production
- **25%** We’re evaluating Camunda as a potential workflow automation solution
- **17%** We’ve decided to use Camunda for workflow automation, but we’re not yet using it in production
- **12%** We’ve built a proof-of-concept with Camunda
- **10%** We’re not using Camunda, and we do not plan to in the future
- **2%** Other

Sample Size: 204 (58% of Respondents)
I would describe my role as:

<table>
<thead>
<tr>
<th>Role</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software architect</td>
<td>54%</td>
</tr>
<tr>
<td>Software engineer</td>
<td>17%</td>
</tr>
<tr>
<td>Product manager</td>
<td>8%</td>
</tr>
<tr>
<td>Engineering manager</td>
<td>7%</td>
</tr>
<tr>
<td>Business analyst</td>
<td>7%</td>
</tr>
<tr>
<td>Other</td>
<td>9%</td>
</tr>
</tbody>
</table>

Sample Size: 200 (56% of Respondents)
How do you expect your team’s budget to change in the coming year?

- 49% My team’s budget will stay the same
- 43% My team’s budget is growing
- 6% My team’s budget will be smaller
- 1% Other

How do you expect your team’s size to change in the coming year?

- 56% My team is growing; we are hiring
- 40% My team size will stay the same
- 3% My team will be smaller
- 1% Other

Sample Size: 191 (54% of Respondents)
Which of the following categories best describes your organization’s industry? – Top 10

- Finance, Insurance & Real Estate: 28%
- Software: 27%
- Telecommunications: 8%
- Government: 6%
- Internet: 5%
- Transportation & Warehousing: 5%
- Education: 3%
- Healthcare: 3%
- Professional Services: 3%
- Manufacturing: 3%

Sample Size: 191 (54% of Respondents)
Approximately how many employees work at your organization (all locations)?

- 2% 0 employees
- 9% 1-9 employees
- 19% 10-99 employees
- 29% 100-999 employees
- 24% 1,000-9,999 employees
- 17% 10,000+ employees

Sample Size: 193 (55% of Respondents)