



Cloud Orchestration at the Level of Application

Project Acronym: **COLA**

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Advanced Computing and Cloud Computing**

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D2.4 Final Dissemination Report M13-M33

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WPL: Andreas Ocklenburg

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Status and Change History

Status:	Name:	Date:	Signature:
Draft:	Liza Ocklenburg, Andreas Ocklenburg	07/10/2019	Electronically
Reviewed:	Tamas Kiss	12/10/2019	Electronically
Approved:	Tamas Kiss	14/10/2019	Electronically

Table 1: Status Change History

Version	Date	Pages	Author	Modification
Draft	07/10/2019	All	Liza Ocklenburg, Andreas Ocklenburg	Initial structure and inputs for the chapters.
For Review	12/10/2019	All	Tamas Kiss	Review and approval

Table 2: Deliverable Change History

Glossary

I4MS	ICT for Manufacturing SMEs project
KPI	Key-Performance Indicator(s)
MiCADO	Microservices-based Cloud Application-level Dynamic Orchestrator
SME	Small and medium-sized enterprise(s)
SaaS	Software-as-a-Service
PaaS	Platform-as-a-Service
IaaS	Infrastructure-as-a-Service
IaC	Infrastructure-as-Code

Table 3: Glossary

1 Introduction

The overall objective of the COLA project was to develop a generic and pluggable framework for the optimized and automated deployment and run-time orchestration of cloud applications. During the lifetime of the project, the targeted outcome (MiCADO framework) was modified and adjusted based on the evolutions of the market and available technologies. However, the common goal to develop a modular multi-cloud framework to automate application deployment and optimise and auto-scale application clusters at run-time, both at virtual machine and container levels, did not change. The main change during the project happened at technical level by the substitution of Docker Swarm, part of the original proposed framework, by Kubernetes. This change had a big influence on the dissemination and communication activities. Parallel to the project, the number and quality of competitive solutions, available on the market, grew significantly. This worldwide strong competition forced the project team to focus on the competitive advantages (USPs) against others.

The main USPs are current:

- European Open Source solution
- Automation of deployment and orchestration
- Scaling on container and VM level
- Great variety of scaling parameters
- Enhanced and tested security
- Commercial support by cloudSME beyond the project

The target groups also evolved during the lifetime of the project. At the beginning of the project DevOps have been seen as the main target group. Based on several presentations and individual talks with professionals during the project, it turned out, that European Datacenters and their solution architects are interested in MiCADO. The usage of MiCADO helps them to automate and provide standardized customer application clusters.

In consequence of all this dynamic evolution it was difficult to reach significant tractions on the market, especially with a complex product which was still immature and in development. Additionally, some external use cases (e.g. Clouddeployer) provided by the ecosystem of cloudSME, could not be served at an early stage of the development. The expectations of commercial companies are typically to get a solution in a short timeframe, and they are not interested in the usage of early versions with related risks. Therefore, dissemination activities needed to be tailored to these dynamic and changing market and customer requirements in order to provide the necessary basis for the commercial exploitation of MiCADO beyond the lifetime of the COLA project.

2 Overview

This deliverable reports on the dissemination activities and training courses during the second part of the project (M13-M33). Additionally, it also reports on the two main dissemination events for industry that were organized to disseminate the project to the general audience, industrial forums, stakeholders and SMEs. The deliverable contributes to the dissemination plan section of the plan to disseminate and exploit foreground knowledge. The first part of Project COLA's dissemination report, M0-M12, was reported in Deliverable "D2.2 First periodic dissemination report".

2.1 Objectives of the Work Package 2

The main objectives of the work package 2 (WP2) including this deliverable are:

- To create a business-oriented image of the project and raise awareness of the project's achievements within business, industry and academia, especially within SMEs and public sector organisations.
- To disseminate and promote the project's achievements among SMEs and public sector organisations, and the general public.
- To organise training events for application developers to get them familiar with the MiCADO framework to develop cloud-aware applications.
- To collect community feedback from SMEs and public sector organisations about the quality and applicability of the MiCADO framework and the COLA project results.
- To contribute to the standardisation of cloud orchestration at application level.

Tasks related to this deliverable

Tasks T2.2 General dissemination activities (M01-M33), T2.3 Organising training events (M04-M33) and T2.4 Collecting user community feedback (M13-M33) are directly related to this current deliverable.

2.2 Task General dissemination activities

Task Leader: cloudSME Participants: All partners - Duration: M01-M33.

This task is implementing objective 2.2. Press releases have been issued at the beginning and will continue to the end of the project to inform the public about the project and the results obtained. Collaboration with magazines and multipliers is pushed to achieve high-quality publications in print and online magazines. During the project, major dissemination events will take place to showcase the results of the project and demonstrate how SMEs and public sector organisations can significantly improve the efficiency of their cloud applications using the project's results.

2.3 Task Organising training events

Task Leader: SZTAKI Participants: cloudSME, UoW, SICS, CB, ST, CS Duration: M04-M33.

This task is implementing objective 2.3 organising training events targeting cloud application

developers both inside and outside the project. User guides and manuals have been developed and will be customized for targeted users considering their specific requirements. The task is led by SZTAKI with long term expertise in organising and facilitating training courses, with other academic and platform provider partners also contributing. CloudSME is responsible for the dissemination activities and logistics of the events.

2.4 Task Collecting community feedback

Task Leader: cloudSME Participants: All other partners Duration: M04-M33.

This task is implementing objective 2.4 Feedback from SMEs and public sector organisations will be collected on how they use the Cloud and particularly how they can and/or would use MiCADO framework. The task will provide input for the technical work packages (WP 5-6-7) regarding how to improve and/or further develop the framework, and also for WP3 regarding potential commercial exploitation and sustainability. All partners will contribute to this adding their local and domain specific dissemination expertise.

3 Dissemination strategy

The dissemination strategy was reported in D2.2 and the new brand “MiCADO” was elaborated and introduced in D2.3. All related communication channels have been set up and used. MiCADO’s new versions, new capabilities, presentations and webinars built the content basis for the communication to the target groups as well as to the general public.

The more MiCADO increased its level of maturity, the more interest it received from the market. This is mainly shown in the increasing numbers in the analytics of the media channel.

During the project lifetime, two stages significantly characterised the dissemination activities of MiCADO, the component change of Docker Swarm and K8s within the modular framework MiCADO. K8s is utilised in production environments and affected MiCADO’s economic considerations and target audiences, the change in communication is described in D3.2 Marketing Campaign.

3.1 Dissemination timeline

At the beginning of the project, the general dissemination timeline for dissemination and communication was divided into three segments:

- M01-M03: Setup of brand management and dissemination plan
- M04-M15: Communication activities and PR work towards multipliers, target groups and magazines to raise first awareness
- M15-M33: Communication activities and PR work towards multipliers, target groups and magazines with success stories and best practice examples

3.2 Dissemination channels

The following section provides a comprehensive overview of the channels utilised, in order to reach the targeted audience and mentioned dissemination goals, COLA is utilising following distribution channels.

Websites. The primary tool for presenting information about the project, like project results, use-cases, and events, is the project website (<https://project-cola.eu>) and the product micro site (<https://micado-scale.eu>).

Social Media. Social Media networks are important means for reaching the different audiences of the project and a sustainable way to stay in touch with people and projects interested in our work and results.

Press Releases. Several press releases will be launched to disseminate the project results and find new collaborations with SMEs and other related projects

Journal Articles. Popular journals and magazines especially in the domain of the use case demonstrators will be targeted.

Internal communication channels. COLA has set up internal and external communication channels, including internal mailing lists and repositories.

Newsletter and contribution to multiplier channels. COLA has set up a joint-newsletter and is also contributing to newsletters of umbrella organizations and business associations in order to inform its target groups about the progress of the project.

Public Dissemination Materials. Brochures, leaflets, posters, white papers, etc.

Demos and visual media. Live and/or pre-recorded demonstrations will be created to show the use and applicability of COLA outcomes, especially to showcase the COLA trials and demonstrators.

Conference presentations. Presentations in specific conferences targeting end users of the MiCADO toolkit and the use case scenarios.

Scientific publications. Scientific publications in high profile journals and conferences to disseminate the results of the project towards the scientific community, especially towards cloud researchers and developers.

3.3 Dissemination Events

The dissemination events target to inform companies, developers and public sector organisations about the progress of Project COLA. The dissemination events are structured in the following categories:

- **Targeted dissemination events.** This included the organisation of the kick-off event as well as the organisation of two major dissemination events.
- **Webinar/Training events.** The first major training event targeted internal project members and the second webinar primarily targeted external companies.
- **Public Events.** The project was constantly attending public events to promote the project and its outcome.

3.4 Dissemination KPIs

The following table states the dissemination activity key performance indicator from 2017. They were used to plan, implement, monitor and validate its dissemination activities during the project lifetime.

Metrics			
Objective	Communication channels	Actions & Milestones	Key Performance Indicators
Create a business-oriented image of the project and raise awareness of the benefits of the COLA project within the targeted communities and the general public	Corporate Identity	Logo design with templates and usage instructions	Logo, website and social media profiles created
	Web page	Purchase of domains and web design	
	Social media	LinkedIn and Twitter presence	
	Public dissemination materials	To create <ul style="list-style-type: none"> • brochures • posters • white papers • footage /videos, etc. • Scientific publications 	At least <ul style="list-style-type: none"> • 2 Brochures • 4 posters or roll-ups • 1white paper • 2 project videos • 11 scientific publications
	Press material	Creation of first templates for press releases, writing press releases & articles	Press releases: 10 Articles in magazines: up to 5
	Events	Dissemination events Institutional (EU headquarters...) Society in general (local political institutions, entrepreneurs...) Technical (ICT)	Self-organised: at least 2 large dissemination events, launch event Attended: up to 12 relevant events (conferences / workshops)
To disseminate and promote the project's activities among SME's and the general public	Online Marketing	Search engine optimization of the website, continuously displaying the success of the project and community building, use of web analytics	Continuous work, at least 1 social media posts a week
	Newsletter(s)	Regular publishing of an own newsletter and contributions to external newsletters	Newsletters: once a month
	Press campaigns	PR with media (print, radio, press, TV)	At least 10 press releases.
	Presentations	Specific conferences to be attended	At least twice a year
Train potential end-users	Training events and training material	User guides and manuals	To be published on the website, continuously updated
		Demos / Tutorials: live and/or pre-recorded demonstrations	Frequently: whenever possible / necessary to have them
		Organisation of webinars to provide a flexible and quick information tool and increasing attention by having a freemium offer	Up to 6 webinars
		Measure the use of the platform with web analytics tools	At least once a week
Collecting user feedback for knowledge exploitation	Use digital tools	Measure the reputation of the project using relevant tools, such as Klout.	At least once a quarter
		Carrying out dedicated surveys with an online survey tool	Run two surveys during the project

During the project lifetime, the project faced different challenges, like the different velocities of science, development and business. Due to this, I was needed to change the dissemination

strategy adapting it to the speed of the MiCADO framework development. The results of the dissemination activities and comparison to its KPIs can be found in the Appendix 7.1.

4 Dissemination Activities and Results

The section reports on the dissemination activities and results. The dissemination results show that Kubernetes enjoys a lot more interest of users and its community is a lot stronger and bigger than the Docker Swarm community. In business, Kubernetes is more likely to be implemented by companies in order to solve more complex project requirements. In order to reach MiCADO's users, companies were actively informed about the development process of MiCADO since the beginning of 2018. The target groups were addressed in personal meetings on several exhibitions and initiative meetings, e.g. Hannover Messe International or the specialized B2B matches by EEN (Enterprise Europe Network). The personal and online meetings focused to build up trustable business relations, to align MiCADO's development with realistic economic needs and to outline potential commercial use cases supporting the sustainability and applicability of MiCADO.

4.1 Project Website

The strategy stated COLA's project website as the primary tool for presenting actual information and to reach the targeted audience. On a regular basis, the website was fed with information, like new MiCADO releases, events, the Open Beta and similar news. The website design, content, strategy as well as the monitoring tools are described in D2.1, the Open Beta was reported in D2.3 User community feedback.

Project Website Analytics

The mentioned data refers to the timeframe from the 5th November 2018 until the 30th September 2019.

In total, 3198 users were generated and generated a total of 4767 sessions. These sessions were caused by 89% new users and 11% recurring users (Fig. 1). Most sessions were started from the United States (709 sessions) followed by the United Kingdom (664 sessions) & France (352 sessions) (Fig.2).

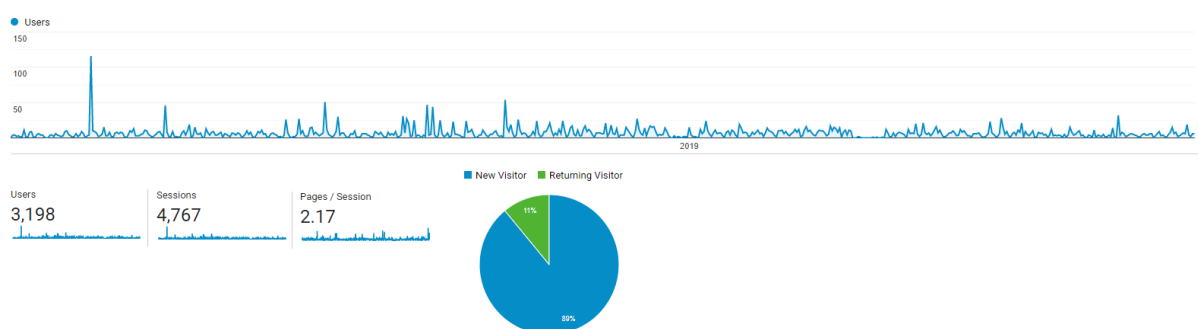


Figure 1: Generated Users from 01/18 to 09/19

Country	Users	Sessions	Pages / Session	Avg. Session Duration
	3,201 % of Total: 100.00% (3,201)	4,774 % of Total: 100.00% (4,774)	2.17 Avg for View: 2.17 (0.00%)	00:02:09 Avg for View: 00:02:09 (0.00%)
1. United States	700 (21.51%)	709 (14.85%)	1.13	00:00:09
2. United Kingdom	351 (10.78%)	666 (13.95%)	2.30	00:02:00
3. France	346 (10.63%)	352 (7.37%)	1.35	00:01:05
4. Germany	293 (9.00%)	878 (18.39%)	3.73	00:05:27
5. Canada	177 (5.44%)	182 (3.81%)	1.35	00:00:22
6. Spain	136 (4.18%)	204 (4.27%)	2.23	00:02:12
7. Italy	115 (3.53%)	134 (2.81%)	2.02	00:01:39
8. Hungary	87 (2.67%)	285 (5.97%)	2.73	00:02:32
9. India	84 (2.58%)	100 (2.09%)	1.44	00:00:44
10. Ireland	79 (2.43%)	82 (1.72%)	1.30	00:00:51

Figure 2: Origin of Traffic

4.2 Product Micro Website

In November 2018, MiCADO's product micro page was originally launched as a one-pager landing page for the open beta. Afterwards, the one-pager was updated and extended on a regular basis. The main objective of the page is to directly address MiCADO's targeted audiences, open-source community and potential commercial partners, and provide them with all relevant information and links of external sources, like GitHub, Read the Docs or the right contact partners. The separation of sub-brands according to the targeted audiences is highlighted. The One-pager is documented in D2.3 User community feedback.

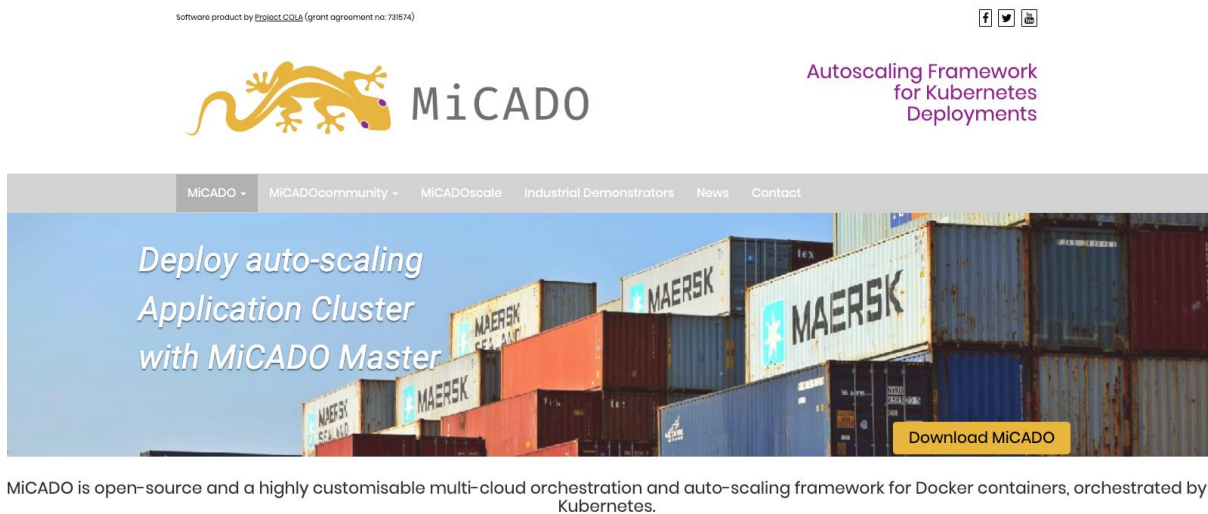


Figure 3: Product Micro Website

With the prospect of placing MiCADO in the free market economy, the One-page was extended to a micro product page, the most important changes are the creation of an open-source community area and the MiCADOscale page (business area). To support the community, the community area wraps up all relevant information, for example mandatory links, trainings and tutorials, are provided as well as the binary market approach of MiCADO is clearly divided and explained to the users. The MiCADOscale page provides information on MiCADOscale services by cloudSME as well as a contact form. The MiCADOcommunity- and the MiCADOscale website are attached in the Appendices 1 and 2.

Product Micro Website analytics

The mentioned data refers to the timeframe from the 5th November 2018 until the 30th September 2019.

In total, 799 users were counted and generated a total of 1313 sessions. These sessions were caused by 88,5% new users and 11.5% recurring users (Fig.4). Most of the sessions were stated from Germany (382 sessions), followed by the US (296) sessions and the United Kingdom (193 sessions) (Fig.5).

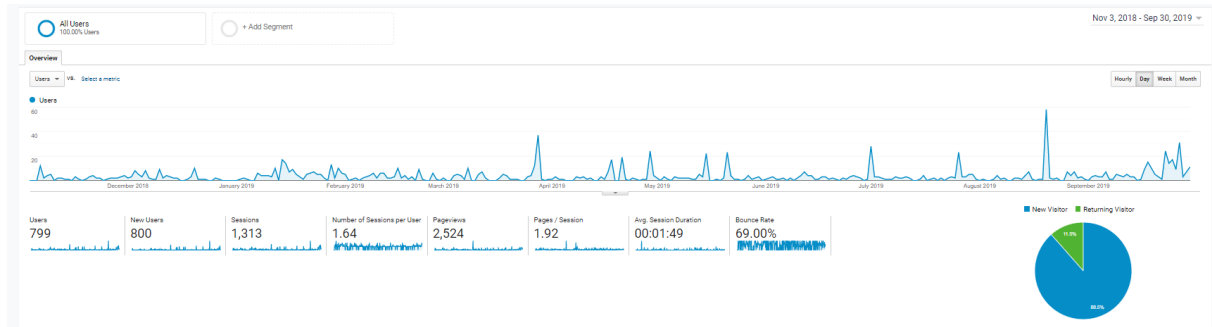


Figure 4: Generated Users from 11/18 to 09/19

Country	Users	Sessions	Pages / Session	Avg. Session Duration
	803 % of Total: 100.00% (803)	1,318 % of Total: 100.00% (1,318)	1.92 Avg for View: 1.92 (0.00%)	00:01:48 Avg for View: 00:01:48 (0.00%)
1. United States	298 (36.47%)	298 (22.61%)	1.01	<00:00:01
2. Germany	141 (17.26%)	383 (29.06%)	2.44	00:03:02
3. United Kingdom	90 (11.02%)	194 (14.72%)	2.18	00:01:56
4. Ireland	58 (7.10%)	59 (4.48%)	1.05	00:00:03
5. Spain	27 (3.30%)	59 (4.48%)	1.92	00:01:51
6. Hungary	23 (2.82%)	70 (5.31%)	3.47	00:04:00
7. China	13 (1.59%)	15 (1.14%)	1.07	<00:00:01
8. France	13 (1.59%)	16 (1.21%)	2.06	00:01:48
9. Greece	13 (1.59%)	23 (1.75%)	1.91	00:03:46
10. (not set)	13 (1.59%)	13 (0.99%)	1.77	00:00:09

Figure 5: Origin of traffic on micado-scale.eu

4.3 Twitter

Two Twitter accounts are running with the objective to disseminate project information and promote MiCADO, on the one hand @ProjectCOLA and on the other hand @MiCADO_EU. The two project related accounts were additionally supported by cloudSME Twitter 's account and other project partners. Users can follow hashtags to get the latest news and thoughts of other users (tweets) that they are interested in. By using the right hashtag, it is possible to disseminate information better to a bigger audience.

Twitter's key performance indicators are:

Indicator	Measured Performance
Impressions	times people saw this Tweet on Twitter
Total Engagements	times people interacted with this Tweet
Detail expands	times people viewed the details about this tweet
Retweets	times people retweeted this tweet
Likes	times people liked this Tweet

Table 4: Twitter KPI's

Twitter Account Project COLA

In the period of M13-M33 @Project COLA (Fig. 6) published in total 68 tweets incl. retweets, earned 62003 impressions and 1015 total engagements, e.g. likes or retweets. Project COLA's Tweet performances 2018 and 2019 are attached in the Appendices 3 and 4, example tweets are provided in the Appendices 5 and 6.

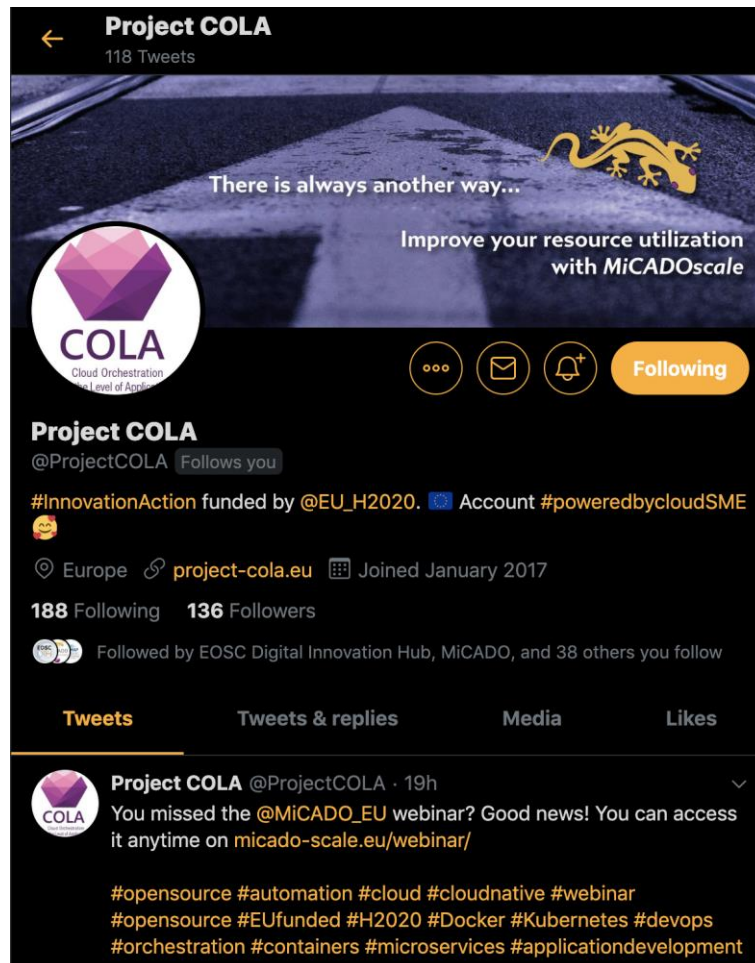


Figure 6: Twitter Account Project COLA

Twitter Account MiCADO

MiCADO's twitter account (Fig.7) was established in September 2018 and activated in January 2019. In the period M25-M33 @MiCADO_EU published in total 25 tweets incl. retweets, earned 11318 impressions and 99 total engagements, e.g. likes or retweets. MiCADO's Tweet performances 2019 are attached in the Appendix 7, example tweets are provided in Appendices 8 and 9.



Figure 7: Twitter Account MiCADO

4.4 Facebook

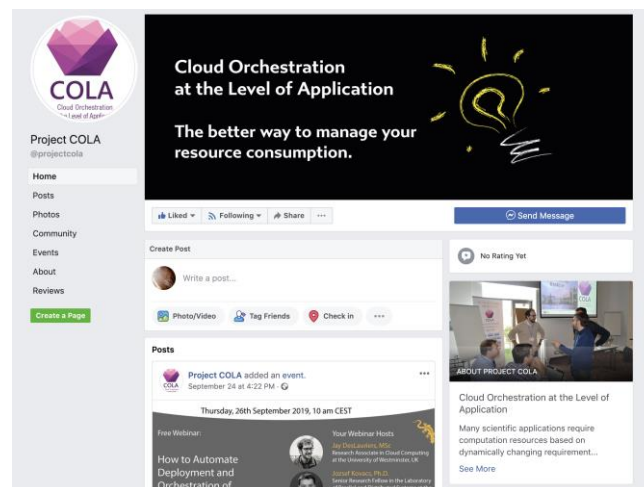


Figure 8: Project COLA Facebook Page

The Project COLA Facebook page (Fig.8) scored a total of 27 total page likes and the posts have similar low engagement rates (Tbl.5). The best performing post was the announcement of the MiCADO v0.7.2 introducing K8s (Fig. 9).

No.	DATE	Reach	Post Click	Reactions
1	30.07.18	0	8	0
2	22.08.18	15	1	0
3	17.10.18	14	0	0
4	18.10.18	123	3	9
5	06.11.18	87	3	11
6	11.12.18	119	15	18
7	13.12.18	19	0	0
8	14.01.18	317	14	13
9	22.01.19	42	2	2
10	04.01.19	0	1	0
11	05.02.19	19	0	0
12	06.02.19	24	3	3
13	26.02.19	21	1	0
14	06.03.19	336	9	6
15	18.06.19	84	7	10
16	05.07.19	95	10	5
17	08.07.19	55	9	14

Table 5: Post Engagement on Facebook

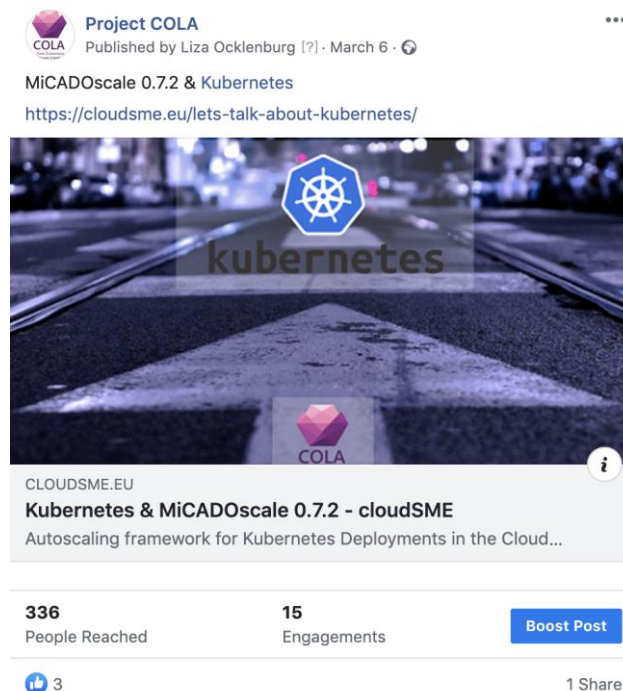


Figure 9: Exemplary Facebook Post by COLA

4.5 LinkedIn/Slideshare

The established group “Project COLA” on LinkedIn and includes 14 members, mainly project partners (Fig.10).



Project COLA

Group • 14 members

Cloud Orchestration at the Level of Application - The “COLA” Innovation Action [project ID: 731574] aims to increase the adoption of cloud computing services - applications require resource scalability a...

Figure 10: Screenshot Project COLA group on LinkedIn

Information, for example the Open Beta Test and new releases were communicated through personal profiles and were shared to the below-mentioned groups. The highest engagement rates scored the v0.7.3 article (Fig. 11), example posts are attached in Appendices 10 and 11.

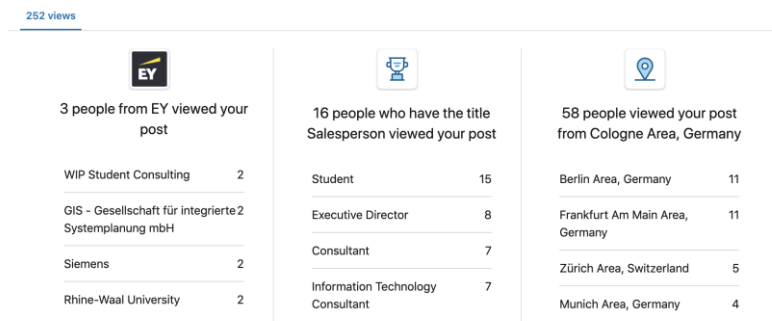


Figure 11: Statistics of MiCADO v0.7.3 post

LinkedIn Groups:

- Data Center Professionals
- Cloud & SaaS Startups
- Cloud Hosting & Service Providers Forum
- AWS Cloud Computing (For Interested Parties & Users)
- Cloud Architect
- Amazon AWS Architects Engineers Developers Consultants Entrepreneurs Experts Web Services Cloud
- Virtualization & Cloud Computing Solutions
- Cloud Technology Professionals
- Cloud Computing, Big Data, Databases and Analytics (Azure | AWS | Hadoop | SPARK)
- Docker/Kubernetes/Mesos/ECS Enthusiasts

Slideshare

12 documents are uploaded on Slideshare, 9 presentations and 3 leaflets are provided to the users. The presentation „Auto-scaling deadline constrained workloads in containers in the cloud“ (Fig. 12) was downloaded one time, accumulated the presentations generated 340 views (Tbl. 6).

Date	Title	Views	Link
12.06.2019	MiCADOscale presented at EGI conference 2019	40	https://www.slideshare.net/projectCOLA/micadoscale-presented-at-egi-conference-2019
21.08.2019	Auto-scaling deadline constrained workloads in containers in the cloud	18	https://www.slideshare.net/projectCOLA/autoscaling-deadline-constrained-workloads-in-containers-in-the-cloud
29.09.2019	What is it (good for)? - MiCADO webinar No.1/4 - 09/2019	64	https://www.slideshare.net/projectCOLA/what-is-it-good-for-micado-webinar-no14-092019
29.09.2019	Building Cloud-Native Applications in MiCADO - MiCADO webinar No.2/4 - 09/2019	68	https://www.slideshare.net/projectCOLA/building-cloudnative-applications-in-micado-micado-webinar-no24-092019
29.09.2019	Scalable WordPress use case - MiCADO webinar No.3/4 - 09/2019	76	https://www.slideshare.net/projectCOLA/scalable-wordpress-use-case-micado-webinar-no34-092019
29.09.2019	Deadline-based scaling - JQueuer Demo - MiCADO webinar No.4/4 - 09/2019	74	https://www.slideshare.net/projectCOLA/deadlinebased-scaling-jqueuer-demo-micado-webinar-no44-092019

Table 6: Presentations on Slideshare

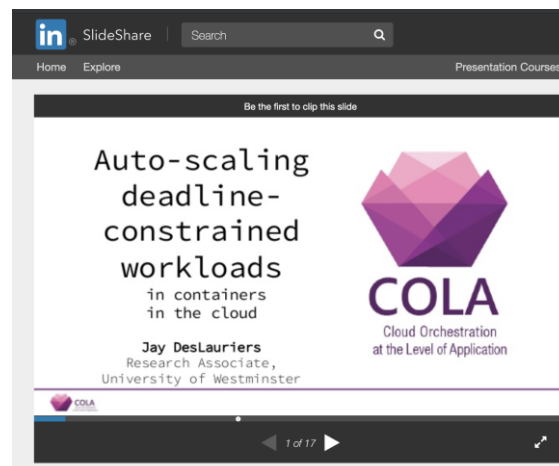


Figure 12: Exemplary presentation on slideshare

4.6 YouTube

The YouTube channel of „[MiCADO by Project COLA](#)“ (Fig.13) includes 3 subscribers, eight self-hosted videos (Tbl.6), more content is contributed by partner channels and provided in playlists.

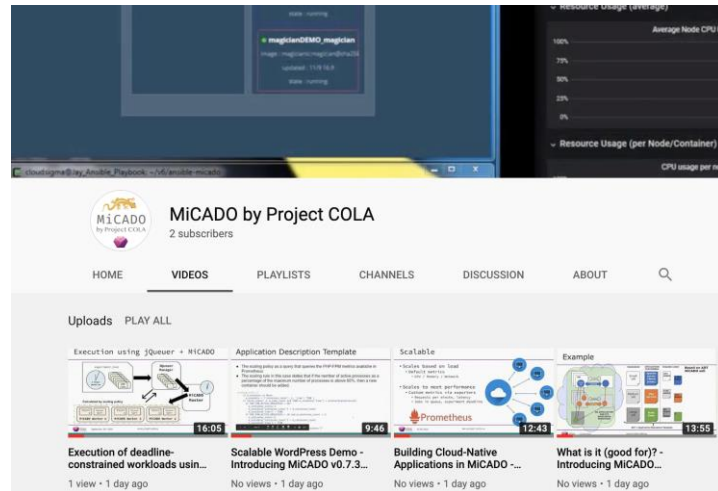


Figure 13: YouTube Channel

Playlists provided:

- Project COLA Partners
- MiCADO by Project COLA
- MiCADO Demos
- MiCADO webinar 26/09/19

The following table 6 shows the uploaded videos on the YouTube channel and their performance, until the 30 of September.

Published on	Title	Views	Link
09.01.2019	MiCADO Tutorial: How to create ADTs in TOSCA	109	https://www.youtube.com/watch?v=Js9vhi_bimY
08.05.19	MiCADO Demo: Easy Social Media Data Analytics with "Magician"	23	https://www.youtube.com/watch?v=mku8iWsi1cs
09.07.19	MiCADO Demo: Simulation of Evacuation Model	15	https://www.youtube.com/watch?v=i1FZw9yHFJI
09.07.19	Automated Deadline-Based Scaling of Experiments in the Cloud with MiCADO		https://www.youtube.com/watch?v=9naGqg7N5GI
29.09.19	What is it (good for)? - Introducing MiCADO framework v0.7.3 (1/4)	11	https://www.youtube.com/watch?v=NzWCyVg46Lk
29.09.19	Building Cloud-Native Applications in MiCADO - Introducing MiCADO v0.7.3 (2/4)	3	https://www.youtube.com/watch?v=kBe7NJwRXdg&t=3s
29.09.19	Scalable WordPress Demo - Introducing MiCADO v0.7.3 (3/4)	7	https://www.youtube.com/watch?v=IQmdAs9FnVY
30.09.19	Execution of deadline-constrained workloads using jQueuer - Introducing MiCADO v0.7.3 (4/4)	3	https://www.youtube.com/watch?v=IVqapW0A3cA

Table 7: YouTube Channel Videos

4.7 Read the Docs

The mentioned data refers the timeframe from the 15th of January 2019 until the 30th of September 2019.

In total, 278 users were generated in the time-frame. The 278 users made a total of 902 sessions. These accesses consist of 74.9% new users and 25.1% recurring users (Fig.14). Most sessions were started from the United Kingdom (329 sessions) followed by Hungary (142 sessions) & the Ukraine (109 sessions).

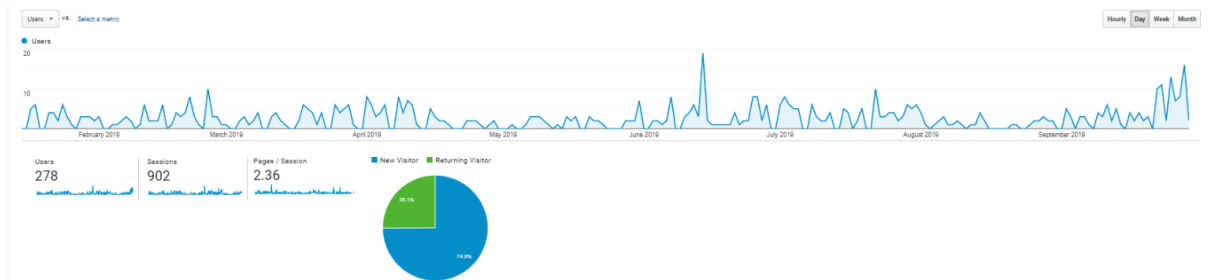


Figure 14: Generated Users from 01/19 to 09/19

From a total of 2127 pageviews, visitors were most interested in the latest software-version (450 pageviews) and its deployment mechanism (323 pageviews). They were also searching for the documentation to develop their own custom ADT-files (152 pageviews). Most users visited the site via a direct call, followed by the corresponding GitHub-Repository of the project.

4.8 GitHub

The code of the MiCADO framework is provided on GitHub, the latest released version 0.8.0 was only published on the 30th September 2019 and downloaded three times. MiCADO's v0.7.3 was raising a lot of interest in the past month and was downloaded about 83 times (Fig. 15), an overview of the downloads of earlier versions can be found in the Appendices 12 to 16.

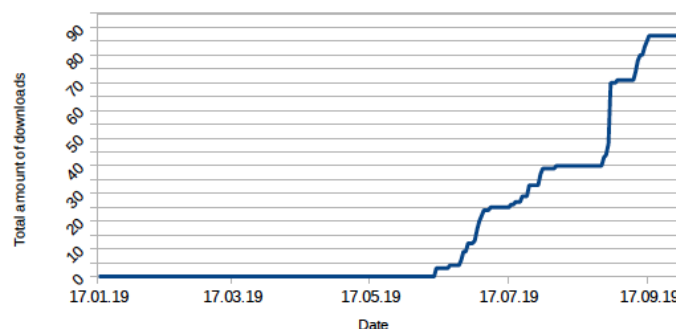


Figure 15: Amount of v0.7.3 downloads

4.9 Newsletter and internal communication

The Cloud Computing Newsletter is issued by cloudSME and provides information on Project COLA, MiCADO, the Innovation Action CloudiFacturing and latest information on the H2020 initiatives and ecosystem. In total, the newsletter reaches up to 740 recipients, the average opening rate is about 28% and the average link click rate is 8%. In general, an opening rate of

24% is a good indicator for a well performing newsletter. The Newsletters are attached in the Appendices 17 to 21.

Project COLA and its outcome was promoted by multiplier and HKN/Nextcloud (Appendices 21 and 22), like the Gesellschaft für Wirtschaftsförderung Duisburg (Society for Economic Development), networker initiative, I4MS, and published on [Cyberwatching.eu](https://cyberwatching.eu), the European observatory of research and innovation in the field of cybersecurity and privacy. The presence on Cyberwatching.eu is attached in Appendices 23 and 24.

4.10 Press Releases

Project COLA received public interest and was published in different medias, like the Cloud Computing Insider, in addition, Nextcloud published a press release about HKN, its OpenStack cloud and MiCADO. Attached in Appendices 25 to 27.

Two final press releases are planned and one of them will be issued in three different languages, German, English and Spanish to maximise the addressed audience. The results are not available yet, the English press release is attached in Appendix 7.4 Final Press Releases.

4.11 Dissemination Materials

Project COLA published various dissemination materials, like leaflets, roll-ups, graphics, T-shirts and MiCADO business cards that are attached in the Appendices 28 to 33.

4.12 Personal Meetings

Personal meeting with different companies and multiplier were made on a regular basis to present and discuss the latest development of the MiCADO framework. By staying close to potential users, new use cases were generated and prototyped.

4.13 Scientific publications

The scientific publications to disseminated project results are reported in section 7.3. In M13 – M33 the project generated more than 11 scientific publications.

4.14 Dissemination Events

The dissemination events are reported in Appendix 7.2 and further images are attached in Appendices 36 to 55. The main dissemination events according to T2.2, major dissemination events took place to showcase the results of the project and demonstrate how SMEs and public sector organisations can significantly improve the efficiency of their cloud applications using the project's results. The major dissemination events were organised by cloudSME and supported by the project members and multipliers.

Dissemination events by Project COLA

Cloud, Edge, and Fog Computing – 13.04.2018

The one-day event was organised by Project COLA in cooperation with ruhr:Hub and targeted to rise a general understanding for cloud computing as well as its capabilities and took place in Duisburg, NRW, Germany. Project COLA presented MiCADO and explained why auto-scalability of resources on the level of application a noteworthy topic is and how people can benefit by the latest technologies.

Hannover Messe 2019 – 01.04.2019-05.04.2019

At the HM 2019, Project COLA was represented by cloudSME at the shared booth of North-Rhine Westphalia and raised high interest with the modifications made. Next to the booth, COLA was presented at the Simulation regulars' table of the CAD forum and sourcing for new cooperations within the B2B matches of EEN. For further images, please go to Appendix 38.

Cloud Computing Symposium 2019 – 20.09.2019

The Cloud Computing Symposium targeted to lower the barriers of Cloud Computing. The Project COLA's outcome and MiCADO were introduced and the potentials highlighted as well as other companies were invited to presented at the one-day event. The target audience was the C-Level of companies located in the area of NRW, Germany. It covered the topics GDPR, Big Data, Cloud Computing, its capabilities and where to find European solutions and how to discover growth opportunities.



Figure 16: DBSRuhr presenting at the Cloud Computing Symposium

4.15 Partner communications

In general, the project partners supported the dissemination activities of Project COLA and published articles and content on their own channels, like websites, Twitter and Newsletters.

5 Training

During the whole project lifetime, trainings have been given by UoW and SZTAKI and most of them were dedicated to support the three internal use cases. Every second week a web conference has been organized to catch the problems and to support the evolution of the three use cases. Also, cloudSME as a nontechnical partner in the project received trainings to retrace the tutorial use cases (Wordpress, Stressng, Nginx).

5.1 User guide & manuals

Readthedocs.org (a common software documentation hosting platform) is used as the central point for creating and publishing user guides and tutorials since release 0.5. Not only the deployment, also all technical specifications, API references and detailed tutorials for some application examples could be found there. In the list of changes the evolution of the MiCADO releases could be tracked. The documentation refers also to Github (Software repository) as well as to the project website (project-cola.eu) and the product microsite (micado-scale.eu). The analysis of usage of readthedocs.org as the central documentation service is already reported in chapter 4 of this deliverable.

5.2 Webinar

There have been several webinars conducted during the lifetime of the project. Most of them were internal to support the three main use cases and to support the colleagues of cloudSME in their activity to comprehend the tutorials and evolution of the software framework.

The main external webinar has been held at the end of the project via Webex on 26th September 2019. It was titled “How to automate Deployment and Orchestration of Application cluster”. About 30 people attended the webinar, which was recorded, cut into four parts and published on MiCADO’s YouTube channel. The promotion of those videos will be done via website, newsletter and social channels. The recorded videos give a introduction and insight into MiCADO’s concept, how to set up the Master node.

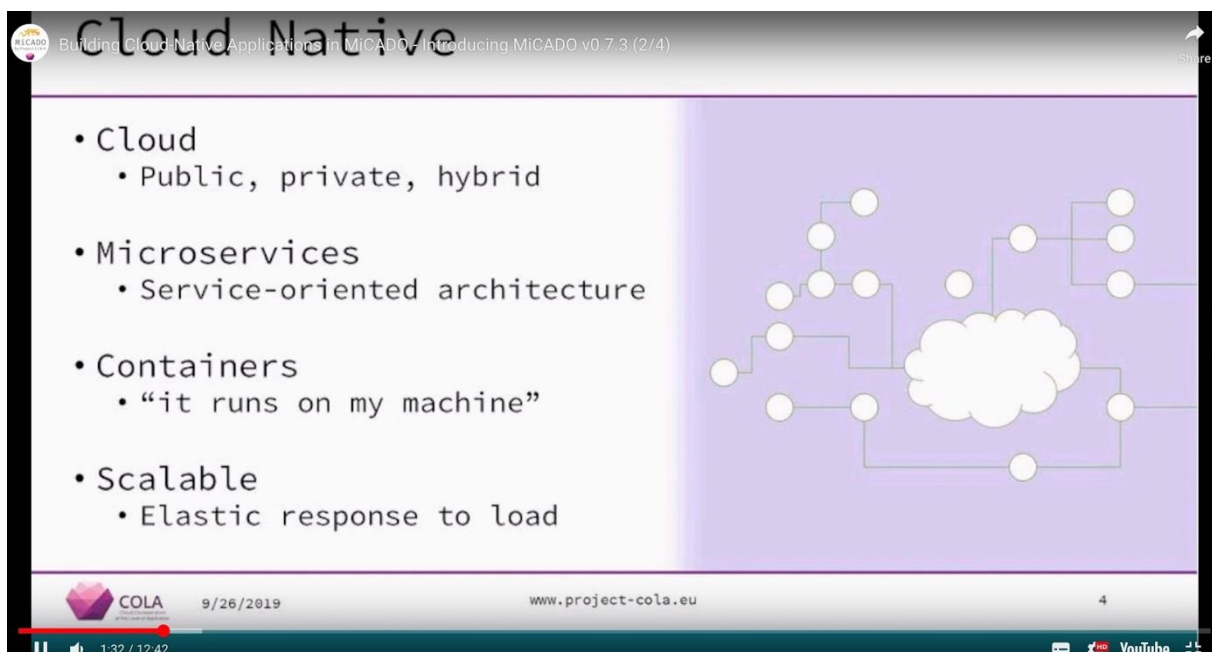


Figure 17: Screenshot of the Webinar Part 2

5.3 Video Tutorials

Video Tutorials are a common action to explain and to gain interest for new technologies are methods. Beginning 2019 a first video tutorial was taken to explain MiCADO framework and especially the creation of the ADT (Application Description Template). The video is titled “MiCADO Tutorial: How to create ADTs in TOSCA”. It is published in MiCADO’s own video channel on YouTube, called “MiCADO by Project COLA”.

Aiming to support the adaption and engagement of MiCADO by professionals outside of the project, there was a need to give more insight in the evolving development. Out of this another series of Video Tutorials have been produced in collaboration with UoW and cloudSME during the summertime 2019. Those videos are to be published in MiCADO’s video channel and examples are attached in Appendices 58 to 60.

6 Outlook

On the last day of project lifetime MiCADO v0.8 was published on GitHub and Readthedocs. This will be communicated on all dissemination channels to keep the growing user community informed and alive.

The dissemination strategy and the proposed related activities have been executed during the project lifetime. It should be mentioned, that the timeframe to communicate the project results was quite short, based on the availability of results and the restrictions by common holidays. Further following actions will be described in the outlook of this deliverable.

At the end of the project, MiCADO reached a TRL of 7 and MRL of 5.5, and the interest towards commercial usage of MiCADO was more and more from interest for the targeted groups. This led to a new potential use case, the utilisation of MiCADO to deploy complex high available Nextcloud clusters for a German data center. At the end of September, this was still in development but almost solved. The MiCADO Nexcloud solution raised, even it is not ready today, significant interest by Nextcloud GmbH (the developer company in Germany) and e.g. the EOSC hub as well. This combination of an interesting applications, supported by MiCADO, will facilitate the sustainability and commercialization of the project outcome.

The final results of the first commercial use case, the “High Performance MiCADO Nextcloud Enterprise cluster”, will be available during October 2019 and will be proudly communicated by all included and related partners (NEXTCLOUD GmbH, HKN GmbH, cloudSME, UoW). This use case already causes some interest in the market (datacenters) out of several reasons:

- Nextcloud is well known in Germany, but in other European countries it is not known – this will change in the next months.
- With MiCADO a Nextcloud cluster is auto scalable, such a solution wasn't available yet
- It will be a practical example how MiCADO could facilitate the business of a datacenter using MiCADO for automatization and deployment of complex clusters, including enhanced security and contemporary scaling technology.
- HKN, the datacenter which will use MiCADO commercially first, is well known in Germany for trustability and the usage of OpenSource technology for more than 20 years. cloudSME and HKN are also member in the EuroCloud professional organization (part of ECO).

First European DIHs already showed their interest to present MiCADO and “Nextcloud by MiCADO” on their solution hubs. This will be proceeded and multiplied in the next months after project end. In the past the DIHs have been more reluctant, as the product was immature and needed to be improved. As well as datacenters and customers in the ecosystem of cloudSME showed their interest in using the mature version of the MiCADO framework.

All above drafted ongoing processes will be accompanied by press releases, success stories and other marketing communication actions to support and sustain the further commercial exploitation of the project outcome.

6.1 Milestones & Events beyond the project:

Implementing Nextcloud solution for EGI

Dissemination Events beyond September 2019							
Date	Name of the Event	Place	Project Partner	Type	Reached audience	Focus of the event	Link of the event page
8.10.2019 – 10.10.2019	It:sa 2019	Exhibition Centre Nuremberg, GER	cloudSME	trade fair, participation	N/A	Trends & innovations in the IT security sector	https://www.it-sa.de/en
29.10.2019 – 30.10.2019	Ruhr Summit 2019	Jahrhunderthalle, Bochum, Germany	cloudSME	Trade fair, participation, B2B match	N/A	largest B2B startup event in Germany	https://summit.ruhr/2019/en/
08.12.2019 – 11.12.2019	WSC 2019 - Winter Simulation Conference 2019	N/A	Brunel University	Accepted Presentation	600	Scaling simulation applications	http://meetings2.informs.org/wordpress/wsc2019/
13.11.2019 – 14.11.2019	Tech Week	Frankfurt, GER	cloudSME	trade fair, participation	N/A	Digital Transformation	https://www.techweekfrankfurt.de/tech-week-2019
14.03.2020 – 19.03.2020	Cloud Fest	Europa Park, Rust, GER	cloudSME	trade fair, participation	N/A	The intelligent cloud: An examination of AI in the Cloud ecosystem	https://www.cloudfest.com/
20.04.2020 – 24.04.2020	Hannover Messe Industry	Hanover, GER	cloudSME	trade fair, participation	N/A	Leading technology trends	https://www.hannovermesse.de/home

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7.1 Dissemination KPIs comparison

Metrics			
Communication channels	Actions & Milestones	Key Performance Indicators	Status
Corporate Identity	Logo design with templates and usage instructions	Logo, website and social media profiles created	Reported in D2.2
Web page	Purchase of domains and web design		
Social media	LinkedIn and Twitter presence		
Public dissemination materials	To create <ul style="list-style-type: none"> • brochures • posters • white papers • footage /videos, etc. • Scientific publications 	At least <ul style="list-style-type: none"> • 2 Brochures • 4 posters or roll-ups • 1 white paper • 2 project videos • 11 scientific publications 	3 x brochures 4 x posters/roll-ups 3 x project videos 15 x scientif. publications
Press material	Creation of first templates for press releases, writing press releases & articles	Press releases: 10 Articles in magazines: up to 5	
Events	Dissemination events Institutional (EU headquarters...) Society in general (local political institutions, entrepreneurs...) Technical (ICT)	Self-organised: at least 2 large dissemination events, launch event Attended: up to 12 relevant events (conferences / workshops)	3 x dissemination events Project Meetings attended More than 30 relevant event attended
Online Marketing	Search engine optimization of the website, continuously displaying the success of the project and community building, use of web analytics	Continuous work, at least 1 social media posts a week	DONE
Newsletter(s)	Regular publishing of an own newsletter and contributions to external newsletters	Newsletters: once a month	Quarterly Published Newsletter & contribution to other multiplier
Press campaigns	PR with media (print, radio, press, TV)	At least 10 press releases.	Payed press campaign was not conducted
Presentations	Specific conferences to be attended	At least twice a year	DONE
Training events and training material	User guides and manuals	To be published on the website, continuously updated	Cross-linking of important sources on the website
	Demos / Tutorials: live and/or pre-recorded demonstrations	Frequently: whenever possible / necessary to have them	Whenever possible Demos and Tutorials were conducted
	Organisation of webinars to provide a flexible and quick information tool and increasing attention by having a freemium offer	Up to 6 webinars	Several internal webinars to

			train project members 2 x public webinars
	Measure the use of the platform with web analytics tools	At least once a week	DONE
Use digital tools	Measure the reputation of the project using relevant tools, such as Klout.	At least once a quarter	Klout is not available anymore.
	Carrying out dedicated surveys with an online survey tool	Run two surveys during the project	1 x survey 1 x Personal Interview sessions with potential clients

Table 8: Dissemination KPIs comparison

7.2 COLA related dissemination events

A list including initials and names is attached below the table of related dissemination events.

COLA related dissemination events							
Date	Name of the Event	Place	Project Partner	Type	Reached audience	Focus of the event	Link of the event page
22.01.2018	Identifying MiCADO users	School of Computer Science and Engineering, Nanyang Technological University, Singapore	Brunel University (ST, AA)	Invited talk	50	Scaling simulation applications	http://scse.ntu.edu.sg/Pages/Home.aspx
23.01.2018	Identifying MiCADO users	Institute of High Performance Computing, Singapore	Brunel University (ST, AA)	Invited talk	20	Scaling simulation applications	https://www.a-star.edu.sg/ihpc
24.01.2018	Identifying MiCADO users	TUMCREATE	Brunel University (ST, AA)	Invited talk	10	Scaling simulation applications	https://www.tum-create.edu.sg/
23.04.2018	Cloud Computing Experience Day	Tec Trum, Duisburg	cloudSME, (AO, SB)	Presentation	+30	Cloud, Edge, Fog computing	https://project-cola.eu/cola-at-the-cloud-computing-experience-day/
19.04.2018 - 21.04.2018	UK OR Society's Simulation Workshop 2018	Ettington Chase Hotel, Stratford, UK	Brunel University (ST, AA)	Presentation	90	Scaling simulation applications	https://www.theorsociety.com/what-we-do/events-conferences/simulation-workshop/
23.04.2018 – 27.04.2018	Hannover Messe Industry	Hanover, Germany	cloudSME (AO, LO, BL)	Exhibit or at the shared	+500	Innovation and Trends in the Industry	https://project-cola.eu/hannover-

				booth of the European Commission			messe-industrie-4-0/
13.6.2018 - 15.06.2018	IWSG 2018 - 10th International Workshop on Science Gateways	IWSG 2018 - 10th International Workshop on Science Gateways	Brunel University (ST, AA)	Presentation	50	Scaling simulation applications	https://sites.google.com/a/nd.edu/iwsg2018/
25.06.2018 - 26.06.2018	Digital Assembly (DA18EU)	Sofia, Bulgaria	cloudSME, (AO)	Attendance	25+	EU digital policy	https://ec.europa.eu/digital-single-market/en/events/digital-assembly-2018-sofia
17.07.2018	Simulation Study Group Meeting	University of Exeter, Business School	Brunel University (ST, AA)	Invited talk	30	Scaling simulation applications	http://business-school.exeter.ac.uk/
10.09.2018	2. KI-MAP meeting	Codecentric AG, Solingen, Germany	cloudSME, (AO)	Presentation	+40	AI meets business	https://www.ki-map.net/2018/09/13/ki-map-netzwerk-traf-sich-zum-2-netzwerktraffen-bei-codecentric-ag-in-solingen/
28.10.2018	2018 Int. Conference on Sensor Networks and Signal Processing (SNSP 2018)	Xi'an University of Science and Technology, China	SZTAKI (PK)	Keynote Speech	100	Building Complex Distributed Infrastructures in Hybrid Multi-Clouds	http://www.snsconf.org/2018/keynote/Kacsuk.html
01.11.2018	Identifying MiCADO users	Cranfield University, UK	Brunel University (ST)	Invited talk	20	Scaling simulation applications	https://www.cranfield.ac.uk/
08.11.2018	Digital Future Congress	Essen, NRW, Germany	cloudSME (LO,BL)	Attendance	30+	Digitalisation	https://www.digital-futurecongress.de/de/
09.11.2018	Tech Week	Frankfurt, NRW, Germany	cloudSME (LO,BL)	Attendance	25+	Digitalisation and trends	https://www.techweekfrankfurt.de/
04.12.2018 - 06.12.2018	ICT 2018: Imagine Digital - Connect Europe	Vienna, Austria	UoW (TK)	Presentation	+30	Cloud researchers, industry representatives	https://ec.europa.eu/digital-single-market/en/events/ict-2018-

							imagine-digital-connect-europe
09.12.2018 - 12.12.2018	WSC 2018 - Winter Simulation Conference 2018	WSC 2018 - Winter Simulation Conference 2018	Brunel University (ST, AA)	Presentation	800	Scaling simulation applications	http://meetings2.informs.org/worpress/wsc2018/
01.02.2019	Identifying MiCADO users	Ford Motor Company, Dunton Research Centre, Basildon, UK	Brunel University (ST)	Invited Talk	10	Scaling simulation applications	https://www.ford.co.uk/
07.02.2019	RSLondonSouthEast 2019	The Royal Society, London, UK	UoW (HD, AU, TK)	Presentation	120	Cloud application developers, research software engineers.	https://rsldon.ac.uk/rsldonsouth-east-2019/
12.02.2019	UKRI Cloud WG Workshop	Francis Crick Institute, London, UK	UoW (JD, AU, TK)	Presentation (Demo)	40+	Cloud Technologies	https://cloud.ac.uk/workshops/feb2019/autoscaling-micado/
25.02.2019 – 28.02.2019	MWC 2019	Barcelona	cloudSME (AO)	Presentation	+100	Tech 4 Corporates session	https://www.mwcbarcelona.com/
1.04.2019 – 05.04.2019	Hannover Messe 2019	Hanover, Germany	cloudSME (AO,LO)	Exhibit or at trade fair	+300	Leading trends and innovations	https://project-cola.eu/hannover-messe-2019/
03.04.2019	Technology & Business Cooperation Days	Hanover, Germany	cloudSME (AO,LO)	B2B matchmaking	5	Networking Cooperation	N/A
03.04.2019	Research Software London Lunchtime Seminar	University of Westminster, London	UoW (AU)	Presentation	50	Research software engineering	https://tinyurl.com/rse-seminar
10.04.2019	EOSC-Hub Week	Prague, Czech Republic	UoW (JD)	Demo Booth & Lightning Pitch	+150	European Open Science Cloud & Supporting Technologies	https://www.eosc-hub.eu/events/eosc-hub-week-2019/demos
14.04.2019 – 15.04.2019	European Simulator Users Conference	Essen, Germany	cloudSME (AO)	Presentation	+30	framework of simulation and digitalization	https://cloudsme.eu/european-simulator-users-conference/

25.04.2019	Identifying MiCADO users	ECMWF, Reading, UK	Brunel University (AA)	Invited Talk	15	Scaling simulation applications	https://www.ecmwf.int/en/about/contact-us/location
06.05.2019 – 08.05.2019	EGI Conference 2019	Amsterdam, The Netherlands	UoW (TK)	Presentation	30+	Scientific research community, cloud developers and operators	https://indico.egi.eu/indico/event/4431/
09.05.2019	FitSM Standard workshop	Amsterdam	cloudSME (AO, LO)	Workshop		IT Service Management	https://cloudsme.eu/fit-sm-workshop/
14.05.2019	HUB:workshop	ruhr:HUB GmbH, Essen, Germany	cloudSME (AH,LO)	Workshop	+20	Scalable business models	N/A
15.05.2019	Identifying MiCADO users	Illinois Institute of Technology, Chicago, Illinois	Brunel University (ST, AA)	Invited Talk	25	Scaling simulation applications	https://web.iit.edu/
16.05.2019	Identifying MiCADO users	Argonne National Laboratory, Chicago, Illinois	Brunel University (ST, AA)	Invited Talk	20	Scaling simulation applications	https://www.anl.gov/
05.06.2019	First Conference of Research Software Engineers in Germany	Potsdam, Germany	UoW (JD)	Talk	30+ (& online)	Research Software Engineering	https://www.de-rse.org/en/conf2019/talk/3N7FJP/
13.06.2019	IWSG 2019 11th International Workshop on Science Gateways	Ljubljana, Slovenia	UoW (JD, TK, GP)	Presentation and talk	25+	Science Gateways & Supporting Technologies, cloud researchers, industry representatives	http://www.iwsg2019.eu/program/
05.09.19	IoT Project Day	Frankfurt am Main, Germany	cloudSME (AO,LO)	Attendance	25+	IoT use cases & Networking	https://www.e-shelter.de/de/iot-project-day
18.09.19	Fourth Conference of Research Software Engineering (UK)	Birmingham, England, UK	UoW (JD)	Lightning Talk	150+	Research Software Engineering	https://rseconuk2019.sched.com/event/QP6S/rse-worldwide-sharing-across-borders
20.09.2019	Cloud Computing Symposium	Duisburg, Germany	cloudSME, Inycom	Event	25+	MiCADO and its USPs	www.cloudsme.eu/ccsym

26.09.2019	MiCADO webinar - How to automate Deployment and Orchestration of Application Cluster	Webex, Online	UoW, SZTAKI, Outlandish, CloudSME	Webinar	30+	Use of MiCADO for deployment and orchestration	https://micado-scale.eu/webinar/
27.09.2019	Outlandish show and tell on Cloud Infrastructure	Online	Outlandish (MK)	Online webinar	26	To talk about the skills we were learning and the potential plan for CoTech	https://community.cooops.tech/t/lets-do-a-show-tell/1521/15
N/A	Lightening Talk on EU COLA project	Space 4 co-operative co-working space	Outlandish (MK)	Presentation with Q&A	24	To talk about the skills we were learning and the potential plan for CoTech	N/A
N/A	Presentation on Outlandish involvement in research project for cloud infrastructure	Wortley Hall	Outlandish (MK)	Presentation and Q&A	50	To talk about the skills we were learning and the potential plan for CoTech	N/A
N/A	Internal workshop	Outlandish offices	Outlandish (MK,HR)	Workshop	5	Skill and knowledge sharing amongst the team within Outlandish	N/A
N/A	Internal workshop	Outlandish offices	Outlandish (MK,HR)	Workshop	5	Skill and knowledge sharing amongst the team within Outlandish	N/A

Table 9: COLA related dissemination events

Name Abbreviation	Name
AA	Anastasia Anagnostou
AO	Andreas Ocklenburg
AU	Amjad Ullah
BL	Benjamin Leich
GP	Gabriele Pierantoni

HD	Hai-Van Dang
HR	Harry Robbins
JD	James DesLauriers
LO	Liza Ocklenburg
MK	Matt Kendon
PK	Peter Kacsuk
SB	Steffen Budweg
ST	Simon J. E. Taylor
TK	Tamas Kiss

Table 10: Initials and Names

7.3 COLA related academic publications

Type	Title	Authors	Title of the journal/book or proceedings	Number, date or frequency of publication	Is peer reviewed?	Is open access?	DOI	Repository link	actions
P	Enabling Modular Design of an Application-Level Auto-Scaling and Orchestration Framework using TOSCA-based Application Description Templates	Deslauriers, J., Kiss, T., Pierantoni, G., Gesmier, G. and Terstyansky, G.	11th International Workshop on Science Gateways, IWSG 2019	in press	Yes	Green, embargo is over		https://westminsterresearch.westminster.ac.uk/item/qv2wq/enabling-modular-design-of-an-application-level-auto-scaling-and-orchestration-framework-using-tosca-based-application-description-templates	N/A
	Secure Cloud-based Platform to Host Healthcare Applications	<u>Pierantoni, G., Kiss, T., Terstyansky, G., Dang, H., Delgado Olabarriaga, S., Tuler de Olivera, M., Yigzaw, K. Y., Belika, J. G., Krefting, D. and Penzel, T.</u>	11th International Workshop on Science Gateways, IWSG 2019	workshop organized every year	Yes	Green, embargo is over		https://research.westminster.ac.uk/file/7ddf00a07b5c1b218c185d8a28be4846251427b356410abdade33ca52be6ed3f/140000/IWSG_2019_paper_5.pdf	N/A
P	Towards secure cloud orchestration for multi-cloud deployments.	Paladi, Nicolae, Antonis Michalas, and Hai-Van Dang.	5th Workshop on CrossCloud Infrastructure s & Platforms. ACM, 2018	workshop organized every year	Yes	Green, embargo is over		https://research.westminster.ac.uk/file/7aba6fc58d22711f77c5b4e64bf00711d54ae1262ecf120b289d2fe3552f0884/176302/2018%20-%20Eurosyst%20-%20Secure_Cloud_Orchestration.pdf	N/A

J	MICADO - Microservice-based Cloud Application-level Dynamic Orchestrator	Kiss, T., Kacsuk, P., Kovacs, J., Rakoczi, B., Hajnal, A., Farkas, A., Gesmier, G. and Terstyanszky, G.	Future Generation Computer Systems	May 2019, p. 814–824,	Yes	Green, embargo is over	10.1016/j.future.2017.09.050	https://westminsterresearch.westminster.ac.uk/item/q2v4v/micado-microservice-based-cloud-application-level-dynamic-orchestrator	N/A
J	A Cloud-agnostic Queuing System to Support the Implementation of Deadline-based Application Execution Policies	Kiss, T., Deslauriers, J., Gesmier, G., Terstyanszky, G., Pierantoni, G., Abu Oun, O., Taylor, S.J.E., Anagnostou, A. and Kovacs, J.	Future Generation Computer Systems	p. 99–111	Yes	Green, Embargo will be over after 03/06/20	https://doi.org/10.1016/j.future.2019.05.062	https://westminsterresearch.westminster.ac.uk/item/qv488/a-cloud-agnostic-queuing-system-to-support-the-implementation-of-deadline-based-application-execution-policies	N/A
P	Towards a Deadline-Based Simulation Experimentation Framework using Micro-Services Auto-Scaling Approach	Anagnostou, A., Taylor, S.J.E., Abubakar, N.T., Kiss, T., Deslauriers, J., Gesmier, G., Terstyanszky, G., Kacsuk, P. and Kovacs, J.	Winter Simulation Conference 2019	in press	Yes	Green, embargo is over	ISSN - 0891-7736	https://westminsterresearch.westminster.ac.uk/item/qvq63/towards-a-deadline-based-simulation-experimentation-framework-using-micro-services-auto-scaling-approach	N/A
C	High Speed Simulation Analytics	Taylor, S.J.E., Anagnostou, A., Kiss, T.	Simulation for Industry 4.0: Past, Present and Future	1 st August 2019, pp 167-189	Yes	Green, under embargo until 26 May 2020	doi:10.1007/978-3-030-04137-3_11	https://westminsterresearch.westminster.ac.uk/item/qv3v7/high-speed-simulation-analytics	N/A
J	Extending Molecular Docking Desktop Applications with Cloud Computing Support and Analysis of Results	Temelkovski, D., Kiss, T., Terstyanszky, G. and Greenwell, P.	Future Generation Computer Systems	August 2019	Yes	Green, until embargo until 12 March 2020	doi:10.1016/j.future.2019.03.017	https://westminsterresearch.westminster.ac.uk/item/qq54q/extending-molecular-docking-desktop-applications-with-cloud-computing-support-and-analysis-of-results	N/A
J	The CloudSME Simulation Platform and its Applications: A	Taylor, S.J.E., Kiss, T., Anagnostou,	Future Generation Computer Systems	20 Jun 2018, pp.	Yes	Green	doi:10.1016/j.future.2018.06.003	https://westminsterresearch.westminster.ac.uk/item/q5853/the-cloudsme-simulation-platform-and-its-applications-a	N/A

	Generic Multi-cloud Platform for Developing and Executing Commercial Cloud-based Simulations	A. Terstyansky , G. Kacsuk , P. Costes J. and Fantini, N.		524-539			18.06.006	the-cloudsme-simulation-platform-and-its-applications-a-generic-multi-cloud-platform-for-developing-and-executing-commercial-cloud-based-simulations	
J	Occopus: a Multi-Cloud Orchestrator to Deploy and Manage complex scientific infrastructures	Jozsef Kovacs, Peter Kacsuk	special issue on "Cloud Computing Orchestration" in Journal of Grid Computing Springer Netherlands	p.19–37 Volume 16, Issue 1	yes	no	https://doi.org/10.1007/s10723-017-9421-3	N/A	N/A
J	The Flowbster cloud-oriented workflow system to process large scientific data sets	Peter Kacsuk, Jozsef Kovacs, Zoltan Farkas	special issue on "Cloud Computing Orchestration" in Journal of Grid Computing Springer Netherlands	p.55–83 ,Volume 16, Issue 1	Yes	no	https://doi.org/10.1007/s10723-017-9420-4	N/A	N/A
J	Deploying Docker Swarm Cluster on Hybrid Clouds using Occopus	Jozsef Kovacs, Peter Kacsuk, Mark Emodi	special issue on "PARENG2017" of Advances in Engineering Software journal Elsevier, 2018	p. 136-145, Volume 125	Yes	No	https://doi.org/10.1016/j.advengsoft.2018.08.001	N/A	N/A
J	Cloud agnostic big data platform focusing on scalability and cost-efficiency	Robert Lovas, Eniko Nagy, Jozsef Kovacs	submitted to special issue on "PARENG2017" of Advances in Engineering Software journal Elsevier, 2018	p.167-177	Yes	No	https://doi.org/10.1016/j.advengsoft.2018.05.002	N/A	N/A
J	Supporting programmable autoscaling rules for containers and virtual machines on clouds	Jozsef Kovacs	Journal of Grid Computing Springer Netherlands, 2019	p.1-17	Yes	Yes	https://doi.org/10.1007/s10723-019-09488-w	N/A	N/A
C	An Architecture for an	Simon J. E. Taylor,	WSC 2018 Proceedings	p.	Yes	Yes	N/A	https://www.informs-	N/A

	Autoscaling Cloud-based System for Simulation Experimentation	Anastasia Anagnostou, Tamas Kiss, Gary Pattison, Shane Kite, Jozsef Kovacs and Peter Kacsuk	IEEE, Dec 2018	739- 748				sim.org/wsc18 papers/includes/ files/061.pdf	
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Table 11: Scientific Publications


Remarks:

1 - [Article in journal] or [Publication in conference proceeding/workshop] or [Books/Monographs] or [Chapters in books] or [Thesis/dissertation]

2 - [Yes - Green OA [insert the length of embargo if any] or [Yes - Gold OA [insert the amount of processing charges in EUR if any] or [NO]

7.4 General Dissemination References


Software produced by COLA (grant agreement no. 739514)



MiCADO


Autoscaling Framework
for Kubernetes
Deployments

MiCADO - MiCADOcommunity - MiCADOtools - Industrial Demonstrators - News - Contact



Enjoy your research and discover new opportunities with MiCADO 0.7.3 you can find all relevant information about MiCADO, its developers, and where to find it's documentation.

From 10/2017 until 08/2019, MiCADO's code was developed by Project COLA, but MiCADO will be further developed. Additional planned features include multi-user management, High Availability, Terraform extension and more.. Some of our project partners, specifically the University of Westminster and the MTA SZTAKI, will proceed with the development of MiCADO. The latest releases and information will be disseminated via the MiCADO Mailing List.



Become part of the MiCADOcommunity!

Insert your Email below to add yourself to the mailing list*



consent*

☐ I would like to subscribe to the Mailing List of MiCADOcommunity to receive more information about MiCADO's development

Scientific publications:



- MiCADO—Microservice-based Cloud Application-level Dynamic Orchestrator (*Journal Article*)
- Automated Scalability of Cloud Services and Jobs (*Conference Paper*)
- A Cloud-agnostic Queuing System to Support the Implementation of Deadline-based Application Execution Policies (*Journal Article*)
- Flexible Deployment of Social Media Analysis Tools, Flexible, Policy-Oriented and Multi-Cloud deployment of Social Media Analysis Tools in the COLA Project (*Conference Paper*)
- Enabling Modular Design of an Application-Level Auto-Scaling and Orchestration Framework using TOSCA-based Application Description Templates (*Conference Paper*)
- Towards a Deadline-Based Simulation Experimentation Framework using Micro-Services Auto-Scaling Approach (*Conference Paper*)

The following developers significantly contributed to MiCADO as part of the Project COLA:

<p>▲ Peter Kacsuk, MTA SZTAKI</p>  <p>Peter Kacsuk is Director of the Laboratory of the Parallel and Distributed Systems in the Computer and Automation Research Institute of the Hungarian Academy of Sciences (MTA SZTAKI).</p>	<p>▼ Tamas Kiss, University of Westminster</p> <p>James Deslauriers, University of Westminster</p>  <p>James Deslauriers Research Associate & leader of MiCADO's development activities at the Department of Computer Science and the Director of the University Research Centre for Parallel Computing.</p>	<p>▼ Gabor Terstysanszky, University of Westminster</p> <p>Hai-Van Dang, University of Westminster</p> <p>Abdelhak Mota, University of Westminster</p> <p>Reimi Ariyattu, University of Westminster</p> <p>Gregoire Desmiers, University of Westminster</p> <p>Gabriele Pierantoni, University of Westminster</p>
<p>▼ Jozsef Kovacs, MTA SZTAKI</p> <p>Attila Frakas, MTA SZTAKI</p> <p>Mark Benjamin Emodi, MTA SZTAKI</p>	<p>▼ Amjad Urch, University of Westminster</p> <p>Huankai Chen, University of Westminster</p>	


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Software produced by COLA (grant agreement no. 739514)



Appendix 1: MiCADOcommunity Page

Software produced by EUSOCC COLA Grant agreement no. 788504

 **MiCADO**

Autoscaling Framework
for Kubernetes
Deployments

MiCADO - MiCADOcommunity - MiCADOscale - Industrial Demonstrators - News - Contact

MiCADOscale

MiCADO for Business

Support and Consultation Service for setup, development and managed services

- Cloud Native Application Development
- Creation of ADTs
- Prototyping of application cluster
- Management and operation of cluster

Our team knows MiCADO by heart. We love to create customised solutions directly, or by establishing connections with the right partner, e.g. infrastructure provider, European technology provider or parallel computing scientist, within our affiliate network, we can create seamlessly running services by the integration of MiCADO, delivering improved server capacity utilisation and greater flexibility allied to much reduced total operating costs. Let us determine the future potentials of your applications and infrastructures to find the best solution for your individual use case.

cloudSME is MiCADO's official support & distribution partner supported by Project COLA members, as a European Cloud Technology Provider, they provide consultation in the area of cloud-native software development, SaaS, PaaS, IaaS, IoT and more.

Your Email


Subject

Message

☐ I consent to cloudSME collecting and storing my data from this form.

☐ I'm not a robot

Contact Us



www.cloudSME.eu

cloudSME UG (haftungsbeschränkt)

TecTower
Bismarckstraße 142
47057 Duisburg
Germany

represented by Andreas Ocklenburg (CEO)
Phone: +49 (0)203 3639 9955
ocklenburg@cloudsme.eu

MiCADOcommunity

Bring in your ideas, develop features, smash some bugs or help us to translate the documentation & tutorials.

[Go to Read the Docs](#)

User Documentation

Dig deeper in MiCADO's user guides and learn more about Application Description Templates.



Public organisation or project?

You have a nice idea to optimise your use case with MiCADO? Let's set a date to determine future potentials and synergy effects.

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Software produced by EUSOCC COLA Grant agreement no. 788504

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Appendix 2: MiCADOscale page

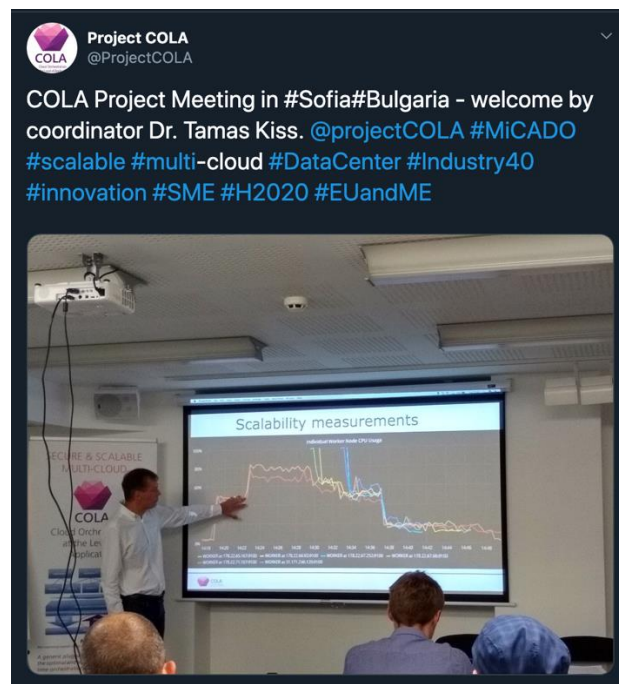
Project COLA's Tweets in 2018							
No.	Date	Impressions	Total Engagement	Likes	Profile visit	Link Clicks	Retweets
1	15.01.18	2224	11	0	2	1	0
2	01.02.18	1111	23	7	2	5	4
3	14.03.18	669	8	1	1	1	1
4	23.04.18	636	18	2	6	0	2
5	07.06.18	1412	10	3	0	3	1
6	18.06.18	1917	15	2	2	1	2
7	19.06.18	1775	19	4	1	2	0
8	19.06.18	6013	110	11	7	36	8
9	20.08.19	1619	16	1	1	2	2
10	17.10.18	2035	15	1	1	3	1
11	25.10.18	539	10	0	0	10	0
12	06.11.18	1625	21	0	0	7	2

Appendix 3: @ProjectCOLA Tweet performance 2018

Project COLA's Tweets in 2019							
No.	Date	Impressions	Total Engagement	Likes	Profile visit	Link Clicks	Retweets
1	11.01.19	1071	48	3	5	7	1
2	11.01.19	642	14	0	0	0	0

3	11.01.19	1482	18	4	0	12	2
4	15.01.19	1151	19	2	1	1	1
5	22.01.19	3131	29	3	4	0	4
6	28.01.19	835	23	1	2	6	0
7	01.02.19	888	23	1	1	10	0
8	08.03.19	840	19	2	0	0	0
9	10.04.19	1093	11	4	0	0	1
10	11.04.19	1578	15	4	2	2	1
11	30.04.18	1311	7	5	0	0	2
12	30.04.18	1469	15	2	1	0	2
13	01.05.19	2326	34	5	0	0	1
14	09.05.19	834	5	2	1	1	0
15	22.05.19	1087	9	1	0	0	1
16	24.05.19	989	3	0	0	0	1
17	29.05.19	1466	8	0	0	1	1
18	31.05.19	1472	9	2	0	0	1
19	18.06.19	968	14	3	3	1	0
20	18.06.19	1552	33	5	3	4	2
21	18.06.19	820	25	2	0	6	0
22	18.06.19	802	22	2	0	2	2
23	18.06.19	2122	60	8	8	2	5
24	19.06.19	935	35	4	3	11	1
25	19.06.19	751	12	1	1	5	1
26	19.06.19	2509	54	9	3	11	5
27	06.07.19	1176	5	1	1	1	0
28	20.08.19	545	2	0	0	0	0
29	28.08.19	1027	7	1	0	0	2
30	03.09.19	444	10	7	0	0	2
31	04.09.19	588	12	2	1	4	3
32	11.09.19	563	3	1	0	0	2
33	20.09.19	810	114	1	2	0	0
34	25.09.19	145	2	1	0	0	1
35	26.09.19	201	3	1	0	0	0
36	27.09.19	367	7	0	1	0	4
37	30.09.19	438	10	0	0	0	3

Appendix 4: @ProjectCOLA Tweet performance 2019



Appendix 5: Tweet COLA - T.Kiss welcomes project members at the Sofia Meeting

Appendix 6: Final Tweet at the final project meeting

No.	Date	Impressions	Total Engagement	Likes	Profile visit	Link Clicks	Retweets
1	11.01.19	1177	23	0	3	1	1
2	14.01.19	594	4	0	2	0	0
3	15.01.19	502	0	0	0	0	0
4	15.01.19	588	4	0	0	0	0
5	16.01.19	1426	7	0	0	2	1
6	22.01.19	462	4	0	0	4	0
7	18.02.19	1046	10	1	3	0	2
8	01.04.19	724	5	2	1	0	2
9	10.04.19	422	9	1	1	2	0
10	30.04.19	384	0	0	0	0	0
11	30.04.19	819	6	0	2	0	3
12	22.05.19	329	1	0	0	1	0
13	06.06.19	181	0	0	0	0	0
14	20.08.19	271	4	2	0	0	1
15	28.08.19	533	3	1	1	0	1
16	06.09.19	166	0	0	0	0	0
17	11.09.19	200	2	2	0	0	0
18	25.09.19	982	1	0	0	0	0
19	26.09.19	152	2	0	0	1	0
20	27.09.19	161	10	0	0	0	0
21	01.10.19	199	4	2	0	0	2

Appendix 7: MiCADO Tweet performance 2019



Appendix 8: MiCADO Tweet - MiCADO in a nutshell

MiCADO
@MiCADO_EU

Check out the first topic of the webinar: What is it (good for)?

youtu.be/NzWCyVg46Lk?t=...

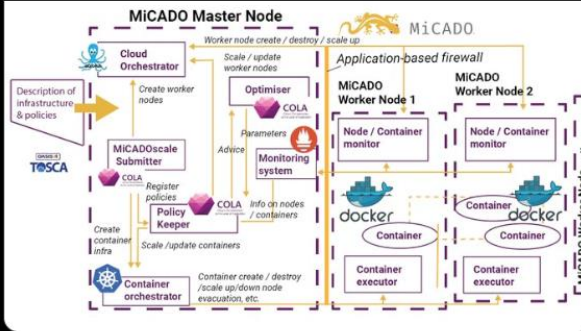
The modular **#MiCADO** framework combines
#applicationdevelopment **#scalability** **#automation**
#orchestration **#automatedDeployment** &
#machinelearning

#DevOps **#DataCenter** **#Microservices** **#EUFunded**

[Tweet übersetzen](#)

Project COLA @ProjectCOLA · 30. Sep.
 You missed the @MiCADO_EU webinar? Good news! You can access it anytime on micado-scale.eu/webinar/

#opensource **#automation** **#cloud** **#cloudnative** **#webinar** **#opensource**
#EUFunded **#H2020** **#Docker** **#Kubernetes** **#devops** **#orchestration**
#containers **#microservices** **#applicationdevelopment**



The diagram illustrates the MiCADO architecture. It starts with a 'Description of infrastructure & policies' which feeds into a 'Cloud Orchestrator'. The Cloud Orchestrator interacts with a 'MICADOscale Submitter' and a 'Policy Keeper'. The Submitter sends 'Create worker nodes' requests to the Cloud Orchestrator, which then sends 'Worker node create / destroy / scale up' commands to the 'Optimiser'. The Optimiser sends 'Scale / update worker nodes' commands to the 'Monitoring system'. The Monitoring system sends 'Parameters' to the 'Optimiser' and 'Info on nodes / containers' to the 'Policy Keeper'. The Policy Keeper sends 'Create container infra' and 'Scale / update containers' commands to the 'Container orchestrator'. The Container orchestrator sends 'Container create / destroy / scale up / down node evsacuation, etc.' commands to the 'Container executor'. The Container executor interacts with 'Container' and 'Container monitor' components. The Container monitor sends 'Node / Container monitor' data to the 'Monitoring system'. The Monitoring system also interacts with an 'Application-based firewall'. The entire system is managed by the 'MICADO Master Node' and consists of multiple 'MICADO Worker Node' instances.

Appendix 9: MiCADO Tweet Webinar

D2.4 Final Dissemination Report M13-M33



Liza Ocklenburg

Product Marketing @ cloudSME - Competence Centre for cloud-based HPC Si...
1w • Docker/Kubernetes/Mesos/ECS Enthusiasts

Webinar "How to automate deployment and orchestration of application cluster with MiCADO" - 29th September - 10 am CEST

Hi, I would like to invite you to the MiCADO webinar. MiCADO is an open-source, highly customisable multi-cloud orchestration and auto-scaling framework for Docker containers, orchestrated by Kubernetes. MiCADO is the outcome of the European funded Innovation Action COLA ("Cloud Orchestration at the Level of Application") and now ready to be tested.

The webinar will cover MiCADO's unique features, native-cloud application development and proven industrial demonstrators. Your hosts are scientists from the University of Westminster and the MTA SZTAKI (development team of COLA).

Click on the link to save a spot!

<https://lnkd.in/dFFZkMJ>

#webex #docker #kubernetes #BigData #orchestration
#automatedDeployment #AutomtedOrchestration

Thursday, 26th September 2019, 10 am CEST



Free Webinar:

How to Automate Deployment and Orchestration of Application Cluster with MiCADO

Your Webinar Hosts

- Jay DesLauriers, MSc**
Research Associate in Cloud Computing at the University of Westminster, UK
- Jozsef Kovacs, Ph.D.**
Senior Research Fellow in the Laboratory of Parallel and Distributed Systems at the MTA SZTAKI
- Amjad Ullah, Ph.D.**
Research Associate in Cloud Computing at the University of Westminster, UK

How to Automate Deployment and Orchestration of Application Cluster – Webinar
micado-scale.eu

Appendix 10: Webinar LinkedIn Post



Liza Ocklenburg

Product Marketing @ cloudSME - Competence Centre for cloud-based HPC Si...
3mo • Virtualization & Cloud Computing Solutions

Started from scratch with the idea to define a generic and pluggable open source framework that supports the optimal and secure deployment and run-time orchestration of cloud applications, called "MiCADO - Microservices-based Cloud Application-level Dynamic Orchestrator".

MiCADO v 0.7.3 is published on GitHub, with the latest development MiCADO core is enabled to run in orchestrated #kubernetes pods. This allows to reschedule dead pods, easier control worker node resources, close unnecessary open ports and optimise the master-worker communication of the framework.

Project COLA website - <https://lnkd.in/dDA3mhf>

MiCADO GitHub - <https://lnkd.in/d3ENWEC>

MiCADO Read the Docs - <https://lnkd.in/dsG8mud>

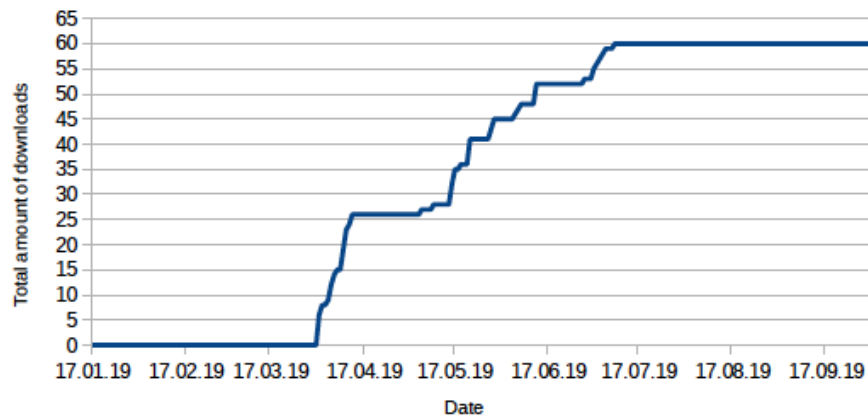
#optimise #framework #orchestration #extension #AWS #Azure
#CloudSigma #modular #opensourcedevelopment #opensourcesoftware
#EU #developers #devops #infrastructure



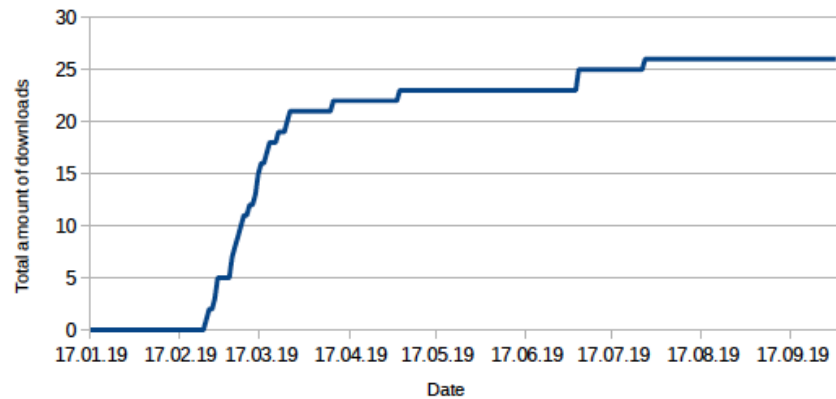
MiCADO v0.7.3

project-cola.eu

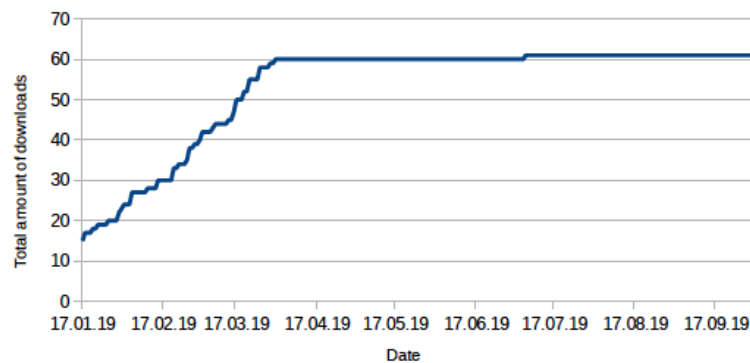
Appendix 11: v0.7.3 LinkedIn post



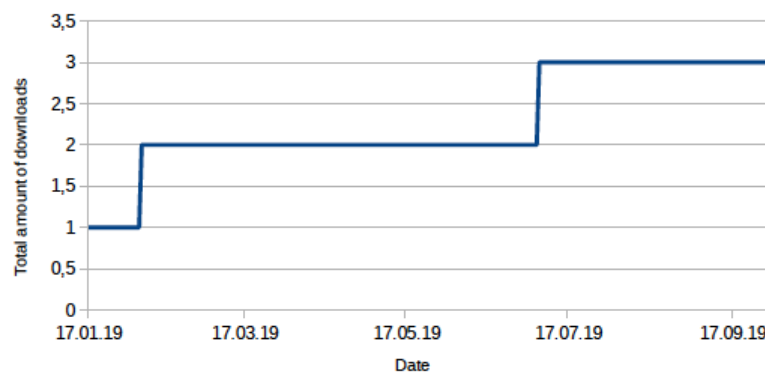
Appendix 12: Number of downloads of MiCADO v0.7.2rev1



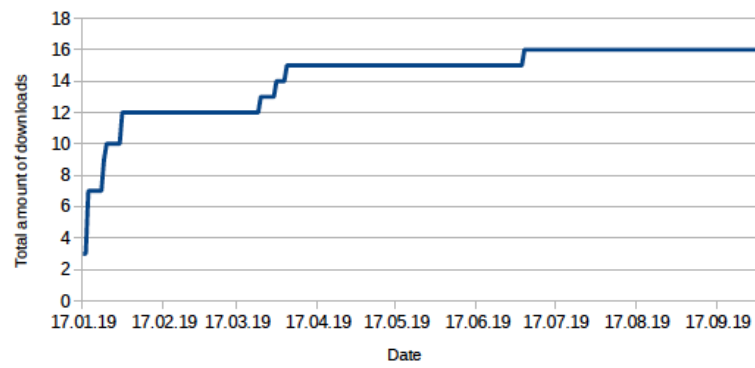
Appendix 13: Number of downloads of MiCADO v0.7.2



Appendix 14: Number of downloads of MiCADO v0.7.1

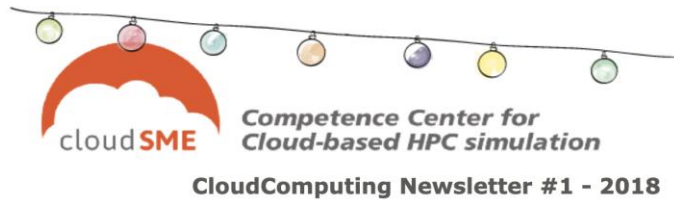


Appendix 15: Number of downloads of MiCADO v0.7.0



Appendix 16: Number of downloads of MiCADO v0.6.1

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Less than 25% of the manufacturing companies in Europe profit from ICT-enabled solutions.

In the **CloudiFacturing** Project, manufacturing SMEs are empowered to compute and solve problems that cannot be tackled without Cloud and HPC technology, making them more competitive by reducing development times for innovative products with better performance.



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ruhr:HUB Experience Day 2018 at Technology Centre Duisburg (13.03.2018)

"Cloud-, Edge-, Fog-Computing: What companies and users need to know"

....provides a comprehensive insight of experts into the state of knowledge and the expected future developments in medium-sized companies, international corporations and top-level EU research.

[ruhr:HUB Experience Day 2018](#)

MICADO V 3.1

MICADO (Microservices-based Cloud Application-level Dynamic Orchestrator) Version 3.1 is available through GitHub.

Please follow our detailed [user guide](#) to download and install.

[Read more...](#)



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If you don't want to receive any more messages (to: application@cloudsme.eu) any longer, you can [unsubscribe](#) free of charge at any time.

Appendix 17: Newsletter #1-2018

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CloudComputing Newsletter #2 - 2018

Analyze your factory data and simulate your workflow to decrease failure rates, capital expenditure and more.

Make the next step in the era of digitalisation and try out cloud-based HPC modelling and simulation to optimize your processes!

Apply now for the Open Call!

Apply with your cross-national team (min. 2 legal entities) in the **next 41 days** for **CloudiFacturing's** first Open Call!



[Learn more about the Open Call](#)



Looking for tester for our HPC Plugin for WordPress!

We care about your opinion - tell us your impressions and experiences.

If you would like to be a tester, please contact us - we are going to grant you budget for the BETA testing!

[Go to the HPC Plugin for WordPress](#)

"COLA" is entering the hot phase

The first phase of developers testings of MICADO is running and the next step is going to be the Alpha Testing phase.

MICADO - Microservices-based Cloud Application-level Dynamic Orchestrator

Keep on track and learn how to benefit from MICADO!

[Go to project-cola.eu](#)



Enable cloud-based CFD with cloudSME

IEEE Transactions on Industrial Informatics published an article dealing with the cloudSME Simulation (Multi-Cloud HPC) Platform

"Enabling Cloud-based Computational Fluid Dynamics with a Platform as a Service Solution"

Thank you for your interest!

If there is anything you want to comment, ask or collaborate with us do not hesitate to contact us!

If you don't want to receive any more messages (to: application@cloudsme.eu) any longer, you can [unsubscribe](#) free of charge at any time.

Appendix 18: Newsletter #2-2018

If this message is not displayed properly, [click here](#) please.



Become a Open Beta Tester

Try MiCADOScale's latest version and be part of its development!

MiCADOScale is a new **auto-scaling framework** for applications in cloud-environments and manages the orchestration at the application level by scaling VMs and their included Docker containers based on the resources currently required. MiCADOScale is provided through an Ansible playbook to reduce the configuration time.



[Read more about MiCADOScale's Open Beta Test](#)



DIH Annual Event was co-organized with the European Commission, the Department of Innovation at the Polish Ministry of Entrepreneurship and Technology, and the EU-funded initiative I4MS. On this occasion, cloudSME was invited by the European Commission to share the panel with other SMEs and partake their experience as a project funded by the EC. Andreas Ocklenburg was invited to talk about how cloudSME was born and then developed in a successful project.

[Read more...](#)

Project COLA @ ICT 2018 in Vienna

ICT 2018 took place in Vienna on 4-6 December 2018. This research and innovation event focused on the European Union's priorities in the digital transformation of society and industry. It presented an opportunity for the people involved in this transformation to share their experience and vision of Europe in the digital age.



[Read more...](#)

1st July 2019 - Save the Date!

1st CloudiFacturing Review Meeting in Brussels

The first period of CloudiFacturing is almost over and the next use cases of the Open Call 2018 are getting ready for their turn. Next to it, the CloudiFacturing-Team is preparing the next Open Call - the 2nd Open Call will start on the 1st July 2019.



The first CloudiFacturing Review Meeting took place in Brussels last week, on the 21st., 22nd. and 23rd. of November.

[Read more...](#)

As the holiday season is upon us, we find ourselves reflecting on the past year and those who have helped to shape our business.

It's been quite a year for us all!

We hope that 2018 has been just as memorable for you, your colleagues and your loved ones.

We look forward working with you in the years to come.

Best wishes, cloudSME-Team



Appendix 19: Newsletter #4-2018

17/09/2019



Cloud can be simple. Visit the Cloud Computing Symposium in Duisburg and experience new cloud technologies, exciting use cases and meet potential partners. Register now and save a free entry ticket! Cloud technologies hide a lot of potential to conquer complex situations reliable and cost-efficient. On September 20th, several presenters will guide you in a relaxed atmosphere through lunch and noon.



Save one of the entrance free tickets! **Register now...**

..or check out the Agenda



Last chance to apply for innovation support and 100k€ funding !



The H2020 Innovation Action "CloudiFacturing" tendered the second Open Call - test new technologies, improve your operative efficiency and receive up to 100k€ funding!

Discover how to apply!

COLA - Cloud Orchestration at the Level of Application



You are invited! Register today for the MiCADO webinar on the 26th of September at 10 am CEST and get insights about MiCADO, how to develop cloud native applications and the industrial demonstrator hands-on session.

Your MiCADO webinar hosts:



Jay DesLauriers, MSc
Research Associate in
Cloud Computing at the
University of
Westminster



Jozsef Kovacs, Ph.D.
Senior Research
Fellow in the
Laboratory of Parallel
and Distributed
Systems at the MTA
SZTAKI

Go to www.micado-scale.eu/webinar and register yourself!

All the best, your cloudSME Team ❤

If you don't want to receive any more messages (to: application@cloudsme.eu) any longer, you can unsubscribe free of charge at any time.

Appendix 20: Newsletter 2019

If this message is not displayed properly, [click here please](#).



All you need to know about MiCADO

Project COLA is over - here are the most important facts.

1. Where is MiCADO coming from?

We, Project COLA, started with the vision to create an auto-scaling framework. A software tool allowing to work with multiple cloud providers and handle different ways of scalability. For example, deadline-based scaling or auto-scaling according to the occurring demand.

During the project lifetime, we were funded by the European Commission with a Grant value of € 3.535.000 under Grant Agreement No. 731574.



2. What is MiCADO good for?

Orchestration of Application Cluster in multiple Cloud environments

Parallel Scaling of Docker container & virtual machines

Automated Deployment of Application Cluster

High Availability

You want more detailed information? Online Webinar available!

We recorded the webinar of the MiCADO developers and divided it into four parts. The webinar in general covers all you need to know about MiCADO.

What is it (good for)?



Presented by Jozsef Kovacs
(MTA SZTAKI)

Webinar Part 1

Building Applications in MiCADO



Presented by James DesLauriers
(University of Westminster)

Webinar Part 2

Scaling WordPress on demand



Presented by Matthew Kendon
(Outlandish)

Webinar Part 3

Deadline-constrained Workloads



Presented by Amjad Ullah
(University of Westminster)

Webinar Part 4

We created a Mailing List for MiCADO's latest developments and releases!
Register now on micado-scale.eu/community!

COLA finished on the 30th of September 2019.
The webinar and other tutorials are also available on:



micado-scale.eu



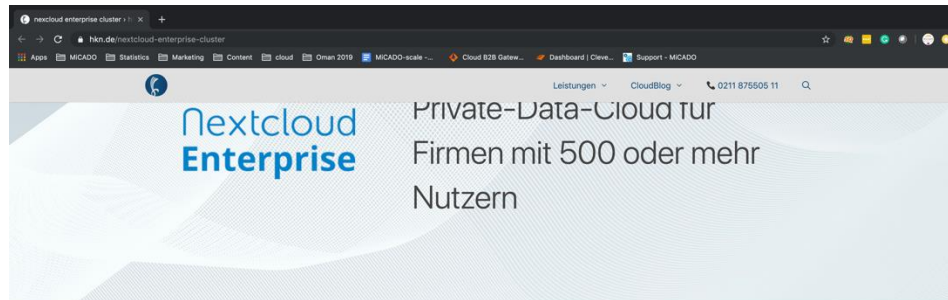
Published by cloudSME on behalf of Project COLA



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CEO: Andreas Oßlenburg
Register: AG Duisburg, HR B 28179
Tax ID: DE815612010

Appendix 21: Post promotion of the MiCADO webinar



Die private Daten-Cloud, die sich wie ein öffentlicher Cloud-Service anfühlt

Mit dem OpenCloud-Nextcloud-Enterprise-Cluster bieten wir eine zeitgemäße Lösung für das Filehosting größerer Firmen ab 500 Mitarbeitern. Auf der Basis von Nextcloud erhält der Kunde seine eigene, private Datencloud, die allen Anforderungen an Complies, DSGVO und GoB gerecht wird.

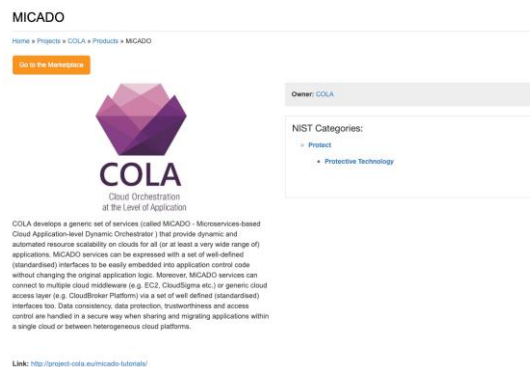
Angebot anfordern

Enterprise-Partner +
Private-Cloud-Cluster +
Auto-Scale -

Mit MICADO scale stellen wir sicher, dass Ihrem Cluster immer genug Ressourcen und Speicherplatz zur Verfügung steht.

Appendix 22: HKN website introducing Nextcloud & MiCADOscale

Source: <https://hkn.de/nextcloud-enterprise-cluster>



Appendix 23: Cyber Watch Article about MiCADO

Source: <https://www.cyberwatching.eu/projects/884/cola/products/micado>

COLA

Cloud Orchestration at the Level of Applications

[Home](#) » [Projects](#) » COLA

Contact	Start Project	End Project	Project type
Luca Di Fiore	01 January 2017	30 June 2019	EC funded project

Introduction

The COLA project aims to increase the adoption of cloud computing services by SMEs and public sector organisations. Building on and extending current research results, it defines and provides a reference implementation of a generic and pluggable framework that supports the optimal and secure deployment and run-time orchestration of cloud applications.

COLA demonstrates the applicability and impact of the solution via large scale near operational level SME and public sector pilots and demonstrators, and also defines a clear pathway how the innovation can be delivered to the market.

Who is the project designed for?

The target users of the outcomes of the COLA project are application developers. The targeted developers are implementing industry and/or public sector applications that require resource scalability and efficient resource utilization. While IaaS clouds typically offer elasticity, applications cannot automatically utilize these features. Developers need to build in custom code to every single application in order to support its automatic scaling up and down.

The aim of the COLA project is to ease this pain of application developers regarding automated scalability. COLA develops a generic set of services (called MICADO) that provide dynamic and automated resource scalability on clouds for all (or at least a very wide range of) applications.

MICADO services can be expressed with a set of well-defined (standardized) interfaces to be easily embedded into application control code without changing the original application logic. Moreover, MICADO services can connect to multiple cloud middleware (e.g. EC2, CloudSigma etc.) or generic cloud access layer (e.g. CloudBroker Platform) via a set of well defined (standardized) interfaces too.

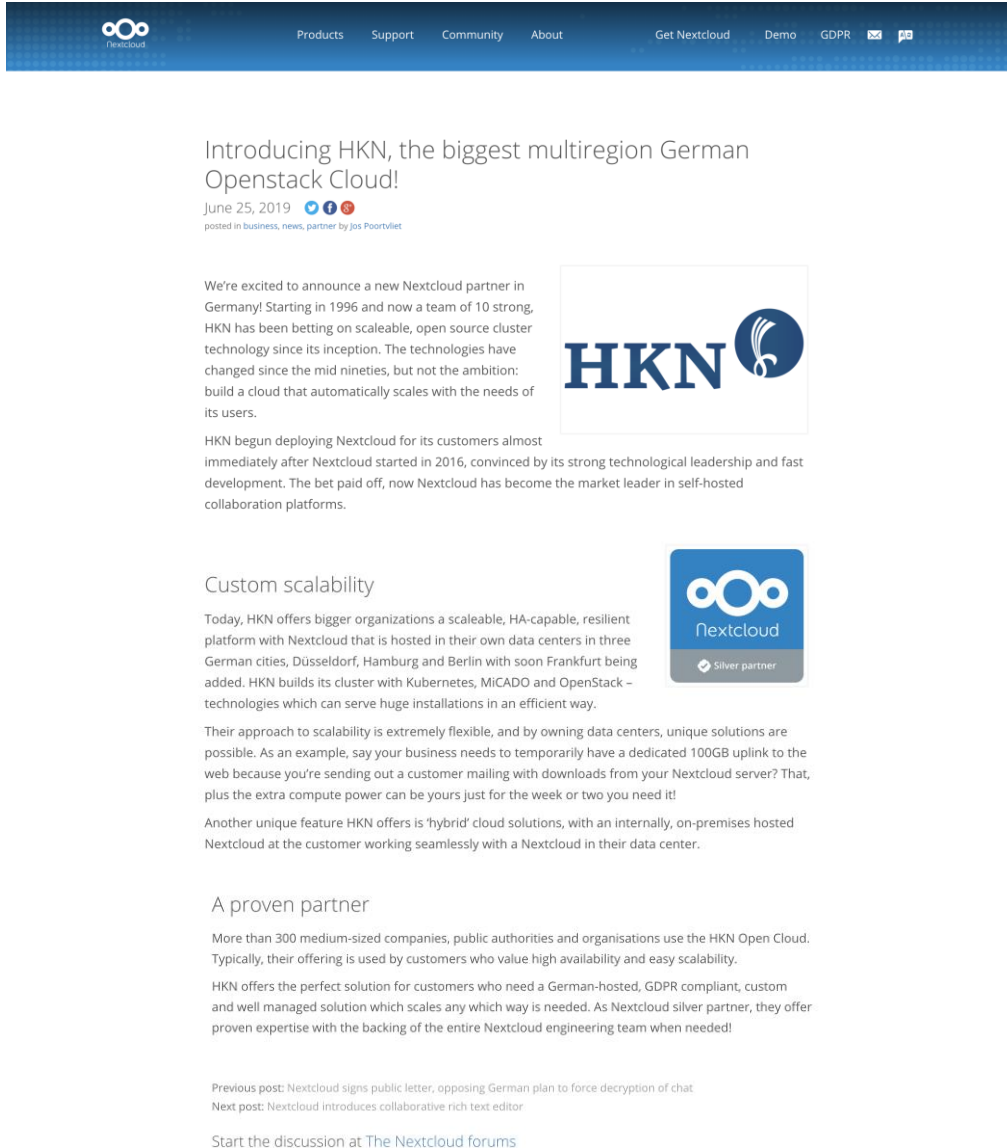
Data consistency, data protection, trustworthiness and access control are handled in a secure way when sharing and migrating applications within a single cloud or between heterogeneous cloud platforms.

How will your project benefit the end-user?







Appendix 24: Cyber Watch Article about COLA

Source: <https://www.cyberwatching.eu/projects/884/cola>



Introducing HKN, the biggest multiregion German Openstack Cloud!

June 25, 2019    
posted in business, news, partner by Jos Poortvliet

We're excited to announce a new Nextcloud partner in Germany! Starting in 1996 and now a team of 10 strong, HKN has been betting on scaleable, open source cluster technology since its inception. The technologies have changed since the mid nineties, but not the ambition: build a cloud that automatically scales with the needs of its users.

HKN begun deploying Nextcloud for its customers almost immediately after Nextcloud started in 2016, convinced by its strong technological leadership and fast development. The bet paid off, now Nextcloud has become the market leader in self-hosted collaboration platforms.

Custom scalability

Today, HKN offers bigger organizations a scaleable, HA-capable, resilient platform with Nextcloud that is hosted in their own data centers in three German cities, Düsseldorf, Hamburg and Berlin with soon Frankfurt being added. HKN builds its cluster with Kubernetes, MICADO and OpenStack – technologies which can serve huge installations in an efficient way.

Their approach to scalability is extremely flexible, and by owning data centers, unique solutions are possible. As an example, say your business needs to temporarily have a dedicated 100GB uplink to the web because you're sending out a customer mailing with downloads from your Nextcloud server? That, plus the extra compute power can be yours just for the week or two you need it!

Another unique feature HKN offers is 'hybrid' cloud solutions, with an internally, on-premises hosted Nextcloud at the customer working seamlessly with a Nextcloud in their data center.

A proven partner

More than 300 medium-sized companies, public authorities and organisations use the HKN Open Cloud. Typically, their offering is used by customers who value high availability and easy scalability.

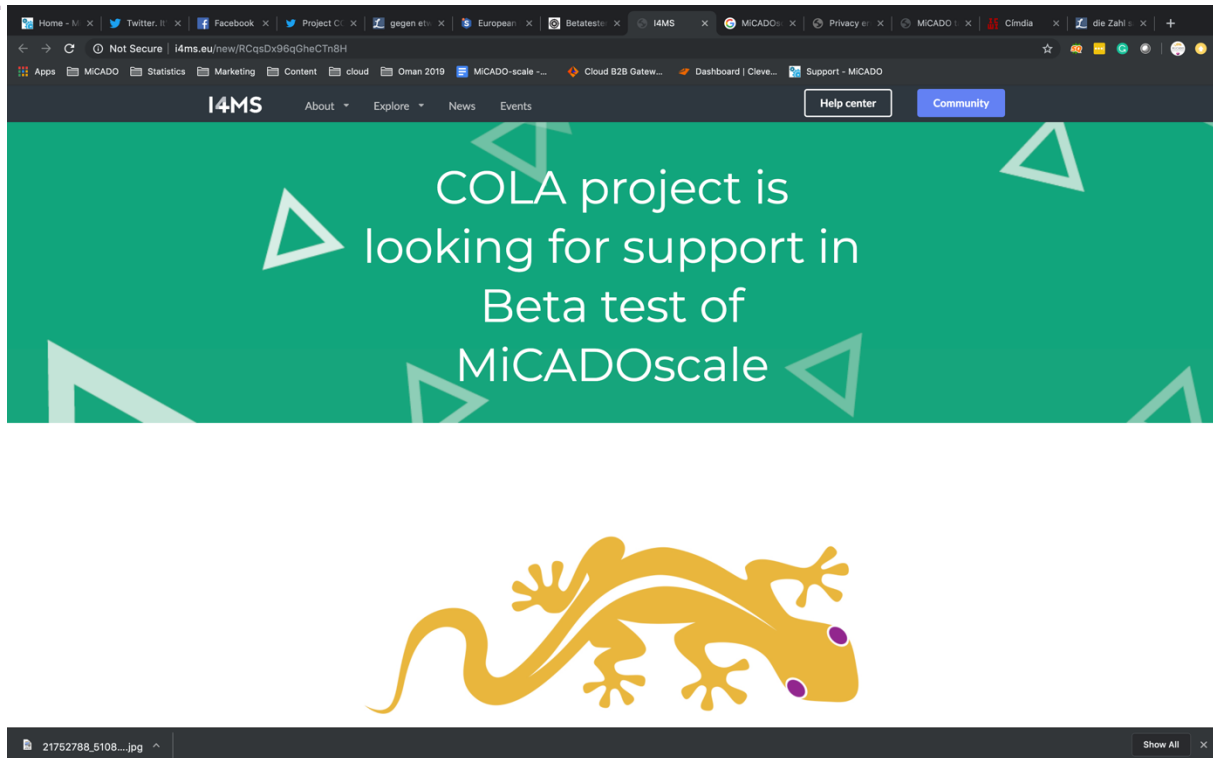
HKN offers the perfect solution for customers who need a German-hosted, GDPR compliant, custom and well managed solution which scales any which way is needed. As Nextcloud silver partner, they offer proven expertise with the backing of the entire Nextcloud engineering team when needed!

Previous post: Nextcloud signs public letter, opposing German plan to force decryption of chat
 Next post: Nextcloud introduces collaborative rich text editor

Start the discussion at [The Nextcloud forums](#)

Appendix 25: Nextcloud press release

Source: <https://nextcloud.com/blog/introducing-hkn-the-biggest-multiregion-german->



Appendix 26: I4MS promoting MiCADO and COLA



Individual Worker Node CPU Usage

**EU-Forschungsprojekt COLA auf der Zielgeraden
Betatester für MiCADOscale gesucht**
16.01.19 | Autor: Elke Wittmer-Gößner

MiCADOscale verwaltet und überwacht Anwendungen für einen optimierten Ressourcenverbrauch. (Bild: cloudSME UG)


Nach knapp zwei Jahren im COLA-Projekt (HORIZON2020) ist das Softwareprodukt MiCADOscale 0.6.1 veröffentlicht worden. Die europäische Innovationsaktion sucht nun Betatester.

Das von der EU geförderte Forschungsprojekt COLA (Cloud Orchestration at the Level of Application) hat zum Ziel, bis 2019 die flexible Software-Architektur MiCADOscale zu entwickeln, ein generisches Plug-In-Framework, das eine optimale und sichere Bereitstellung sowie die Laufzeit-Orchestrierung von Cloud-Anwendungen unterstützt. Für MiCADOscale 0.6.1 werden nun **Betatester** gesucht. Die offene Testphase endet am 31. Januar 2019.

**Skalierbare Services über Multi-Cloud-Plattformen nutzen
Projekt COLA plant Orchestrierungs-Framework**
28.02.17 - Das von der EU geförderte Projekt COLA (Cloud Orchestration at the Level of Application) soll eine Software-Architektur entwickeln, mit der sich Services skalierbar und sicher über Multi-Cloud-Plattformen nutzen lassen. [lesen](#)

In der heutigen EDV-Umgebung, in der eine Verlagerung von Investitionen zu Betriebsausgaben stattfindet, ist ein automatisch skalierbares Ressourcen-Framework erforderlich, das auf den Bedarf der Anwendungen sowie auf die zugewiesenen Ressourcen anspricht. Immer mehr Anwender nutzen Cloud-Ressourcen, um auf Schwankungen in der Anwendernachfrage zu reagieren, mieten Instanzen dazu, um die fristgerechte Fertigstellung

Appendix 27: Cloud Computing Insider PR "MiCADO Open Beta Test"



MiCADO

by Project COLA

Automate deployment, scheduling and scaling of containerised applications

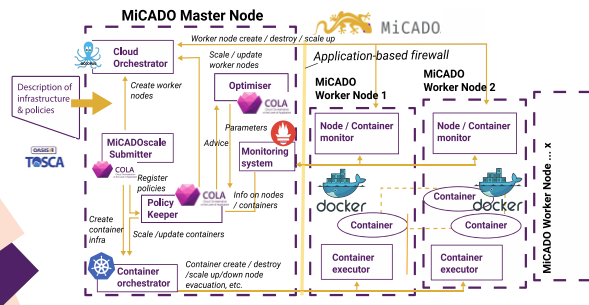
Parallel scaling of Docker containers and VMs

Customisable scaling policies

Multi Cloud support

Application-based firewall


Open-source



Infrastructure as Code (IaC)
The next generation of IT automation


Deploy MiCADO Master Node via Ansible playbook, the application and infrastructure will be rolled out by MiCADO Master Node via ADT (yaml-file).

@MiCADO_EU
www.micado-scale.eu



@ProjectCola
www.project-cola.eu

The COLA Project – Cloud Orchestration at the Level of Application (COLA) receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 731524.



Appendix 28: MiCADO roll-up

MICADO SERVICE BENEFITS

The results of project COLA enable generic application developers to implement applications that automatically optimise cloud resource utilisation based on application developer/operator defined quality of service parameters (QoS).

Application developers will be able to extend their application code with MiCADO service calls (the generic set of services developed by project) in order to utilise the scalability and optimisation services at both deployment and also at run-time.

Application operators will be able to define desired quality of service parameters, e.g. maximum response/ completion time, maximum cost, security policy requirements etc. MiCADO services will assure that the application is deployed in an optimal way based on the defined parameters.

Moreover, MiCADO services will monitor the application at run-time and will automatically scale it up or down in order to optimise application execution based on the user-defined multidimensional set of QoS parameters. Users/application operators can also modify the parameters during run-time to trigger rescaling of resources, if necessary.

PROJECT PARTNERS



COLA
Cloud Orchestration
at the Level of Application

Project Director: Dr. Tamas Kiss (UoW)
t.kiss@westminster.ac.uk

Project Manager: Dr. Gabor Terstyánszky (UoW)

UNIVERSITY OF WESTMINSTER

RI SE

MTA SZTAKI

Brunel University London

Modeling & Simulation Group

ScaleTools

CloudBroker

BALABIT

CloudSigma

saker solutions

Outlandish

sarga

Inycom
innovation technologies

Published by:

cloudSME UG
Bismarckstr. 142
47057 Duisburg
Germany

cloudSME Simulation for
manufacturing & engineering

Email: cola@cloudsme.eu
Tel. +49 (0) 203 3639 9955

Version 11-2017

SECURE & SCALABLE MULTI-CLOUD



COLA

Cloud Orchestration
at the Level of
Application

New version available:
MiCADO V3 released

➤ www.project-cola.eu
➤ twitter.com/projectCOLA
➤ facebook.com/projectCOLA

<http://www.project-cola.eu>

COLA – Cloud Orchestration at the Level of Application
receives funding from the European Union's Horizon 2020
research and innovation programme (Grant No. 731574).



Appendix 29: MiCADO v 0.3.0 Leaflet



MiCADO

Autoscaling Framework for Kubernetes Deployments



MiCADO

easy deployment of scalable software

MiCADOscale is a highly customisable multi-cloud orchestration and auto-scaling framework for Docker containers, orchestrated by Kubernetes.

- **Software Scaling at Application Level**
- **Multi-Cloud Support**
- **Highly customisable scaling policies**

- **Enhanced Security by ZORP**
- **Open Source-based**
- **Multi-functional Dashboard**

For Data Centers and DevOps

www.micado-scale.eu






Appendix 30: MiCADO v 0.7.3 Leaflet V1

Project COLA

Cloud Orchestration at the Level of Application

MICADOscale is a highly customisable dynamic autoscaling framework that has been developed within Project COLA (Cloud Orchestration at the Level of Application). It particularly aims to increase the adoption of cloud computing services by SMEs and the public sector. Typical industry and public sector applications require resource scalability and efficient resource utilisation in order to serve a variable number of customers with dynamic resource demands, and to reliably optimise resource consumption and costs.

Project COLA is an Innovation Action funded by the European Commission as part of the Horizon2020 Programme. It started in January 2017 and lasts 33 months. The consortium includes 10 companies and 4 research organisations from 6 European countries, including the United Kingdom, Hungary, Sweden, Switzerland, Spain and Germany.

MiCADO

Auto-scaling Framework for Docker Containers orchestrated by Kubernetes



Want consultation?



Prof. Thomas Kiss
Project Coordinator / Director of Research Centre for Parallel Computing, University of Westminster, London
t.kiss@westminster.ac.uk



Andreas Ocklenburg
CEO, cloudSME UG, Duisburg
andreas.ocklenburg@cloudsme.eu
+49 172 92 17 406

MiCADO at a glance

- Open source modular framework
- Application level autoscaling (scaling both Docker containers and virtual machines)
- Multi Cloud Support, currently supported: AWS, CloudSigma, MS Azure, CloudBeak, OpenStack & OpenNebula
- Highly customisable scaling policies
- Application level firewall by ZONE for enhanced security
- Multi functional Dashboard (currently supported: Kubernetes dashboard, Grafana and Prometheus)
- Professional support services for MICADOscale by cloudSME



Enable peak-loads to be easily accommodated

Contact:

cloudSME UG (haftungsbeschränkt)
Tiefenstraße 142
47657 Duisburg
Germany
Phone: +49 (0)203 3639 9955
Email: info@cloudsme.eu

Web:
www.micado-scale.eu
www.project-cola.eu
www.twitter.com/MiCADO_EU
www.cloudsme.eu
www.facebook.com/cloudsme

COLA

Cloud Orchestration at the Level of Application

Responsible for this publication:

University of Westminster

Microservice-based Cloud Application-level Dynamic Orchestrator

Automated deployment and orchestration of application cluster

MiCADO is a highly customisable multi-cloud orchestration and auto-scaling framework for Docker containers, orchestrated by Kubernetes and for Virtual Machines.

- Open-source
- Multi Cloud Support
- Customisable scaling policies
- Enhanced Security
- Multi-functional Dashboard
- Professional service for business

COLA
Project COLA is funded by the Horizon 2020 framework programme



www.project-cola.eu



www.micado-scale.eu



www.micado-scale.eu

Documentation, Tutorials, Demos

auto-scaling framework for Docker containers, orchestrated by Kubernetes

MiCADO can accommodate high peak loads while also optimising resource consumption by auto-scaling at the levels of virtual machines and Kubernetes deployments.

Industrial Technology Demonstrators

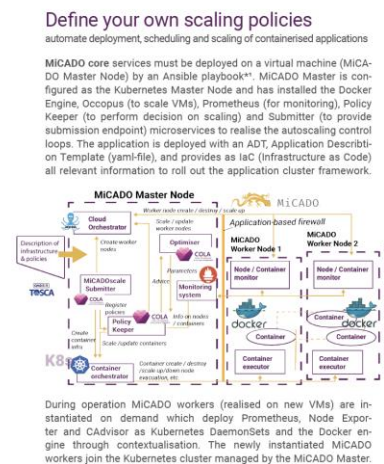
- ✓ **Deadline-based scalable Evacuation Service**
Complete evacuation simulation runs by a given deadline while optimising resource consumption.
- ✓ **Public Sector Social Media Analysis**
Process Big Data without worrying about peak loads and system crashes.
- ✓ **Server Resource & Peak-load Management**
Stop paying for underutilised resources, scale your resources horizontally

 micado-scale.eu/demos

 **Read the Docs.** Go to MICADO's latest user documentation and discover our tutorials: stressng, cqueue, nginx and wordpress. micado-scale.readthedocs.io

 **GitHub.** Check out MICADO's source code on GitHub! The MICADO community is working on the next release that will introduce multi-user management, vertical scaling and High Availability. github.com/micado-scale

 Point your smartphone's camera at the QR code and click on the notification URL that pops up.



Become part of the MiCADOcommunity!

MICADO is open-source: scan the code, visit our community on micado-scale.eu and discover demos, tutorials, publications and training sessions, developed by the University of Westminster and MTA SZTAKI. Feel free to test MICADO, adjust it, make it better and share your changes with the community. MICADO's code is hosted on GitHub and the documentation is provided on Read the Docs.

 Add yourself to the MICADO Mailing List micado-scale.eu/community/


MiCADOscale powered by cloudSME

Enjoy managed services, customised solutions directly, or by establishing connections with the right partners, e.g. infrastructure provider, technology provider or parallel computing scientists, within our affiliate network. Create seamlessly running services by the integration of MICADOscale, delivering improved server capacity utilisation and greater flexibility allied to much reduced total operating costs.

Your European Development and Support Partner

Together, we aim to find the best solution for your individual case with the help of our affiliate network. Let's make an appointment for a chat to determine the future potentials of your applications and infrastructures.

Appendix 31: MiCADO leaflet v0.7.3 V2



MiCADOscale

Autoscaling Framework for Kubernetes Deployments
micado-scale.eu & project-cola.eu

Autoscaling Framework for Kubernetes Deployments

micado-scale.eu & project-cola.eu

	kops	kubernetes	kubespawn	AmazonEKS	Google Kubernetes Engine	MiCADOscale
Agnostic Cluster Deployment	✓	✓	✓	✓	✓	✓
Automated Cluster Deployment	✓	✓	✓	✓	✓	✓
Complex Custom Metrics	✓	✓	✓	✓	✓	✓
Complex Algorithm auto-scaling	✓	✓	✓	✓	✓	✓
Cloud-Agnostic Virtual Machine Scaling	✓	✓	✓	✓	✓	✓
Simplified Application Deployment	✓	✓	✓	✓	✓	✓
Enhanced Dashboard	✓	✓	✓	✓	✓	✓
Enhanced Security	✓	✓	✓	✓	✓	✓
Modular	✓	✓	✓	✓	✓	✓

Appendix 32: MiCADO business cards



Appendix 33: MiCADO sample T-Shirt



LA COMISIÓN EUROPEA EVALÚA EL PROYECTO COLA
El proyecto forma parte del Programa H2020

Home > Noticias > La Comisión Europea evalúa el Proyecto COLA

Noticias

, 02/10/2018

Bruselas, acogió el pasado 20 de septiembre la evaluación intermedia del Proyecto COLA, enmarcado dentro del programa H2020. Inycom, junto con el resto de los socios que trabajan en el proyecto, presentaron con éxito ante la Comisión Europea los resultados obtenidos a lo largo de los primeros 18 meses de trabajo, de los 30 totales que dura el proyecto.

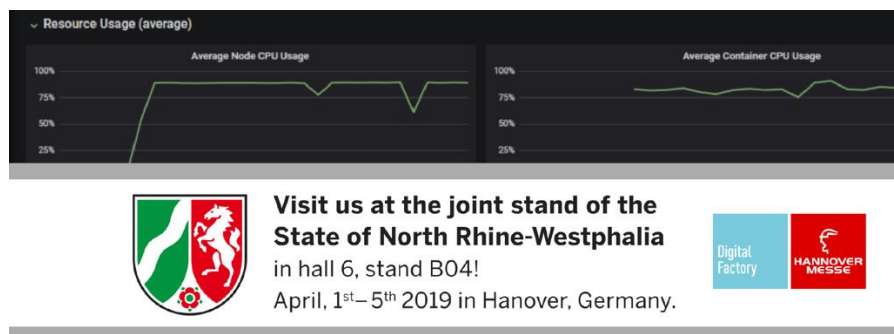
Comunicación y relación en los medios
Vanessa Carabante
imagenycomunicacion@inycom.es
+34 902 995 820

Top

Appendix 34: Partner Dissemination: Inycom Article



Appendix 35: Exemplary tweet by Outlandish



Appendix 36: Promotional banner for HMI '19



Hannover Messe 2019

Home of industrial pioneers

From the 1st to 5th of April 2019, we exhibited together with other companies from North-Rhine Westphalia on the shared booth of [Wirtschaft.NRW](https://www.wirtschaft.nrw.de/)

at the Hannover Messe, all key industrial technologies and core industry sectors at one place.

The motto of the industrial show was "Integrated Industry – Industrial Intelligence". The organizers were interested in the interplay of automation and energy technology, intralogistics, IT platforms and artificial intelligence. The fair showed potential and proved at the same time that interactions of human beings remain indispensable.



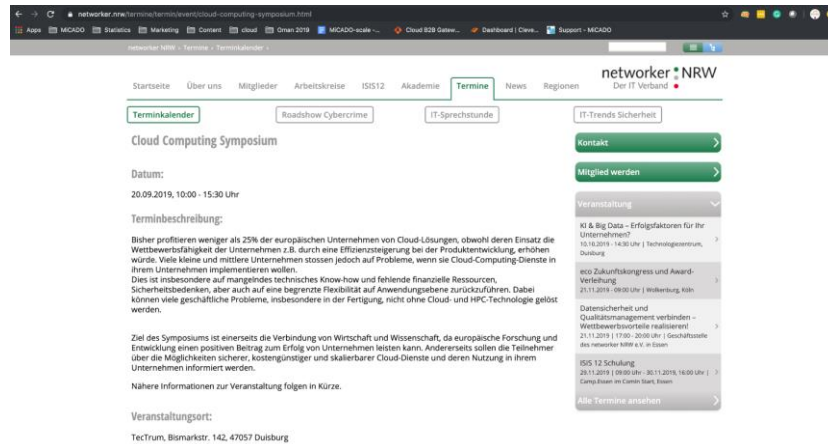
Networking, networking, networking

Appendix 37: Website post about HMI '19



Appendix 38: Introducing Project COLA to eco/EuroCloud (Peter Koller) HMI '19

D2.4 Final Dissemination Report M13-M33

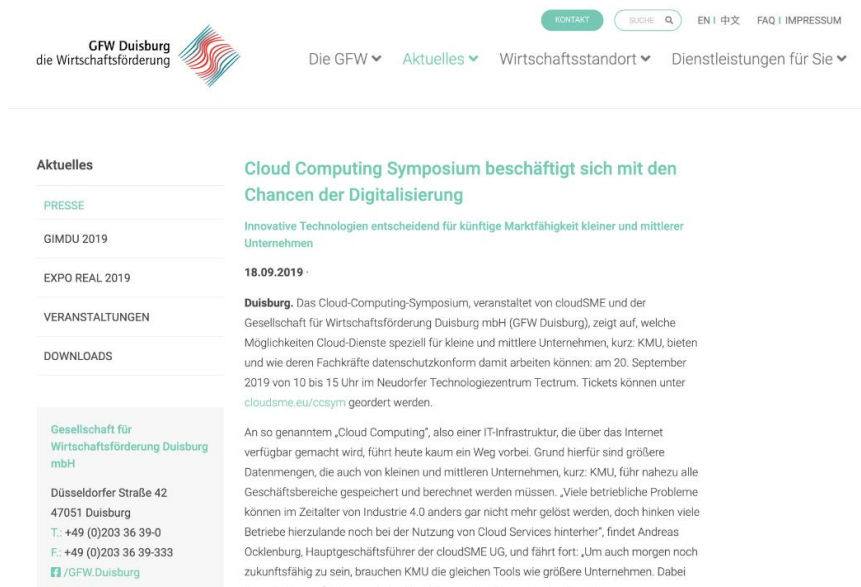


Appendix 39: Multiplier “networker NRW” promoting Cloud Computing Symposium



Die Notwendigkeit für Cloud Computing ergibt sich aus immer größeren Datenmengen, die von Unternehmen gespeichert, verarbeitet und auf verteilten Systemen bereitgestellt werden müssen. Darüber hinaus können viele Aufgaben nicht ohne Cloud- und HPC-Technologie gelöst werden – insbesondere im Zeitalter von Industrie 4.0. Um heutzutage erfolgreich bestehen zu können, benötigen kleine und mittlere Unternehmen (KMU) dieselben Tools wie größere. Das Cloud Computing Symposium hilft dabei KMUs Duisburg...

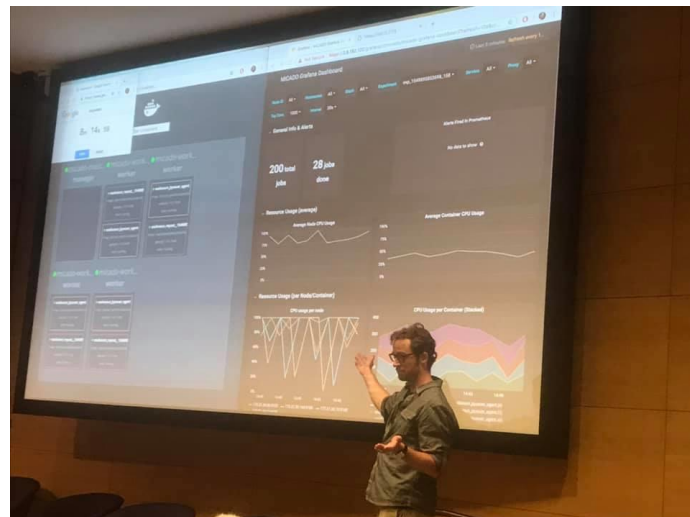
Appendix 40: Promotion of CCSym on digitales.nrw



Appendix 41: Co-host GfW Duisburg promoting CCSym



Appendix 42: UKRI Cloud WG Workshop



Appendix 43: J. DesLauriers at the UKRI Cloud WG Workshop



Appendix 44: H-V Dang at the RS London South East 2019



Appendix 45: RS London South East 2019



Appendix 46: N. Fantini (WP3 leader) & A. Ocklenburg (WP2 leader) at the HMI '18



Appendix 47: A. Ocklenburg promoting COLA at the HMI '18



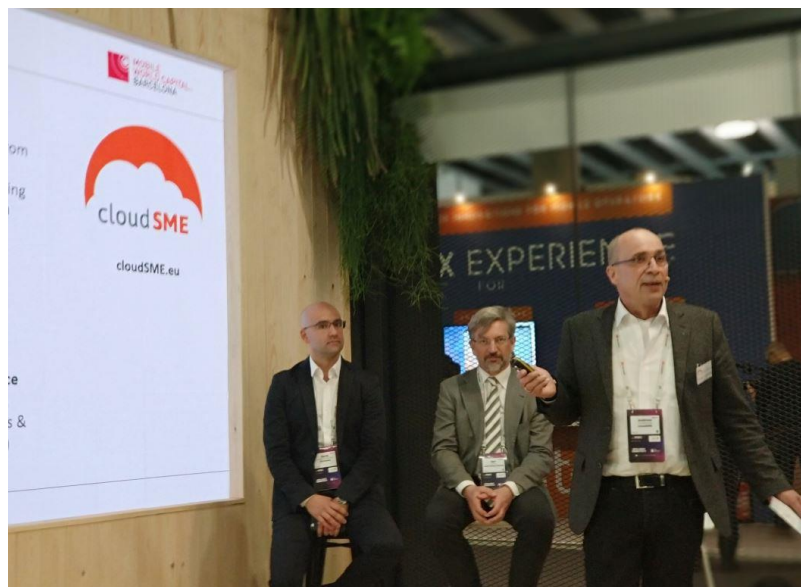
Appendix 48: COLA Team at HMI '18



Appendix 49: DA18EU



Appendix 50: German AI (KI-Map) meeting by Zenit



Appendix 51: MWC 2018 in Barcelona



Appendix 52: Tech Week 2018



Appendix 53: Digital Future Congress 2018



Appendix 54: Simulator conference 2019



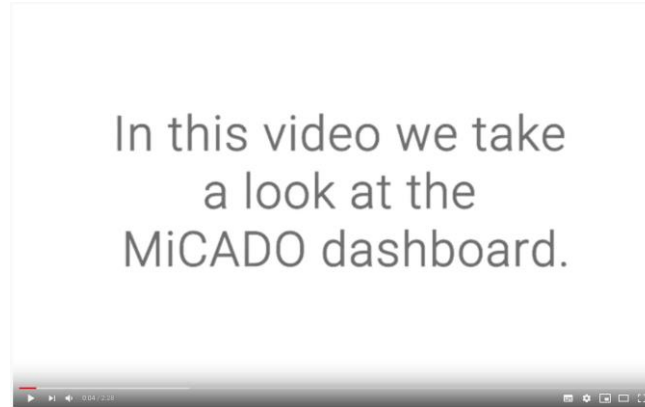
Appendix 55: Cloud Computing Symposium 2019



Appendix 56: Video Tutorials with J. DesLauriers



Appendix 57: Video Tutorials with J. DesLauriers (2)



Appendix 58: Video Tutorials with J. DesLauriers (3)

7.5 Final Press Releases

Press Release by Project COLA

Duisburg, 30th of September 2019

Project COLA is coming to an end and presents MiCADO – the multi cloud orchestration and auto-scaling framework

After 33 months of collaboration, travelling through Europe and developing MiCADO, Project COLA is coming to its end and is presenting the MiCADO framework.

In the past decades, requirements of software systems have changed significantly. Scalability, automation and sustainability now strongly influence the profitability of companies. The foundation for this change is the elasticity of Cloud technologies that supports designing practical solutions in order to scale and automate processes, networks or cloud-native applications according to the changing needs or demands of users. Cloud-native applications are structured as microservices where multiple single services are packaged in containers. Services, such as databases, cloud orchestrators and file storage solutions are deployed as microservices and managed on an elastic cloud infrastructure.

The range of solutions on the market supporting microservices and scalability is simply enormous (most well-known tools include Docker Swarm, Rancher & Kubernetes). However, such solutions require specific expertise when developing secure and scalable application clusters and infrastructures and are also limited regarding their scalability policies. Since January 2017, funded with a grant value of EUR 3,535,000, the European Innovation Action COLA developed MiCADO, a modular multi-cloud framework to automate application deployment and optimise and auto-scale application clusters at run-time both at virtual machine and Kubernetes deployment levels.

MiCADO framework

MiCADO Master is deployed on a virtual machine via an Ansible playbook, configured as the Kubernetes Master Node and has installed:

- the Docker Engine,
- Occopus to scale VMs,

- Prometheus for monitoring,
- the COLA Policy Keeper to act on scaling decisions and
- the COLA Submitter to provide a submission endpoint.

The MiCADO Master Node supports the operation, management and monitoring of applications based on specific parameters such CPU or network traffic, detecting bottlenecks, and realising the autoscaling control loops. The desired deployment and run-time characteristics of the application are defined in a TOSCA-based Application Description Template (ADT) that provides all relevant information, application requirements, infrastructure characteristics and scaling policies to roll out the Infrastructure and manage the application cluster. Additionally, scaling decision can be further improved with a machine learning based optimiser.

MiCADO's Industrial Demonstrators

To prove and demonstrate MiCADO's applicability for industry-scale problems, three near production quality demonstrators and 24 further proof of concepts were implemented during the project's lifetime. These three large MiCADO demonstrators and a commercial trial are briefly described below.

Evacuation Planning Service

Evacuation plans are required for high hazard fields production areas, like nuclear plants or chemical plants, by the authorities. In case of emergency, time to act is limited and it is needed to have a valid plan to decide and act on. To accomplish this, simulation models need to be set-up and different cases of emergency considered, like single sets of possibilities, starting conditions, while respecting the specific kind of emergency. Evacuation simulation models are computed various times, each scenario runs for multiple replications to allow variance in statistical distributions, for example, different walking speeds. By introducing MiCADO, the simulation of experiments can be restricted to a certain time frame and resources as well as microservices scale based on the desired deadline. This allows running simulations in the desired time while improving the quality of decision-making processes by reducing time-to-decision and providing more information to the decision-maker and improve the confidence of making a decision.

Social Media Analytics for Public Sector Organisations

Public sector organisations are facing similar challenges to companies: it is hard to identify the needs and requirements of the public. The Aragon Regional Government tackled this issue by monitoring thousands of public service processes and introducing a recommendation system, based on Big Data Analytics and publicly available data such as Twitter tweets to improve citizens' interactions with public services. Before introducing MiCADO, the fluctuating demand by users created unpredictable peak-loads on the infrastructure and significantly reduced the quality of the delivered services. Thanks to MiCADO, the recommendation system can now automatically scale the related microservices and resources and ensure a stable high-quality service.

Audience Finder – Scalable WordPress platform

Audience Finder is a national audience data and development tool in the UK that enables cultural organisations to understand, compare and apply audience insight. Before implementing MiCADO, the software was hosted on a large AWS EC2 instance to meet the required computational power and provide seamless services. Outside high peaks the instance was barely used, and the under-utilised resources generated unnecessary costs. To manage peak-loads and server capacities with MiCADO, and to reduce operational costs, WordPress and Audience Finder were dockerised and hosted on small AWS EC2 instances. Within the MiCADO framework, Audience Finder's microservices can be separately managed, debugged and scaled according to the occurring demand.

Commercial Prototype MiCADO managing Nextcloud Enterprise

Nextcloud is an online storage and collaboration tool. Nextcloud Enterprise is aiming to create a Cloud storage for companies in compliance with internal specifications, the European GDPR and generally accepted accounting principles (GAAP). By joining forces, the MiCADO team and HKN, a German data center are working on the dockerisation of the application enabling automated deployment processes and additional services, such as Disaster Recovery and High Availability of databases and clusters.

Time is up for COLA

After 33 months of collaboration, travelling through Europe and developing MiCADO, Project COLA is coming to its end. However, MiCADO will not disappear. The software will be further developed the University of Westminster and MTA SZTAKI and will be commercialised by cloudSME. The official distribution partner of MiCADO is cloudSME also providing consulting & development services for companies that want to utilise or extend MiCADO functionalities for the deployment and management of their applications.

The COLA Project received funding from the European Commission's Horizon 2020 research and innovation programme under grant agreement No 731574. The project website will be maintained for the coming years, presenting information and updates on COLA and MiCADO.

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Project COLA website: www.project-cola.eu

MiCADO website: www.micado-scale.eu

Attached Media: MiCADO Master & Worker Node Concept, MiCADO logo, Project COLA logo

MiCADO Master & Worker Node Concept:

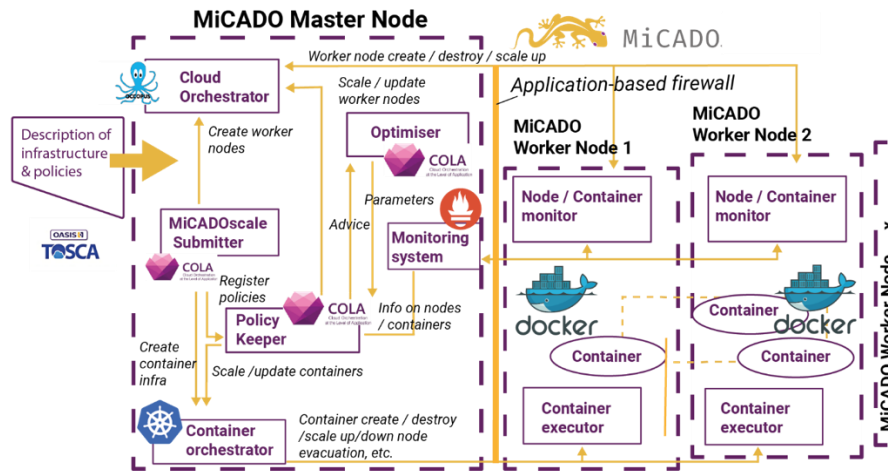


Figure 18: MiCADO Master & Worker Node concept

MiCADO logo:



Figure 19: MiCADO logo portrait format



Figure 20: MiCADO logo landscape format

Project COLA logo:



Figure 21: Project COLA logo landscape format



Figure 22: Project COLA logo Portrait Format

Press Release by Project Coordinator University of Westminster

The [Cloud Orchestration at the Level of Application \(COLA\)](#) project, that was funded by the European Commission and led by the University of Westminster's Centre for Parallel Computing (CPC) team and Prof. Tamas Kiss as principal investigator, has been completed at the end of September. The main outcome of the project is a software product, [MiCADOScale](#), that enables companies and public sector organisations to develop and deploy a new generation of applications that utilise cloud computing resources in a safe and cost-efficient way. MiCADOScale assures that a cloud application utilises just the right amount of computational and data resources in a highly secure environment, resulting in significant cost savings and optimised efficiency. The software is open source and has already attracted significant interest from the community and from commercial partners. Three software companies, [Saker Solution](#) and [Outlandish LLP](#) from the UK and [Inycom](#) from Spain, all partners in COLA are developing and rolling out commercial offerings utilising MiCADOScale. [CloudSME](#), a German start-up that was created based on the results of a previous EU project led by the CPC, is the main marketing and commercialisation force behind the solution. Teaming up with German data center and cloud provider HKN, they are currently finalising an offering, based on MiCADOScale and [Nextcloud Enterprise](#) to provide a GDPR compliant storage solution for companies. Other application areas where MiCADOScale is applied include evacuation simulation, analysis of publicly available Twitter data to support decision making processes of local authorities, and the analysis of ticket sales by cultural institutions to maximise their audience.

