

# Acumos/DCAE Integration

*ML/AI aided ONAP-DCAE*

March 2021



OPEN SDN & NFV LAB

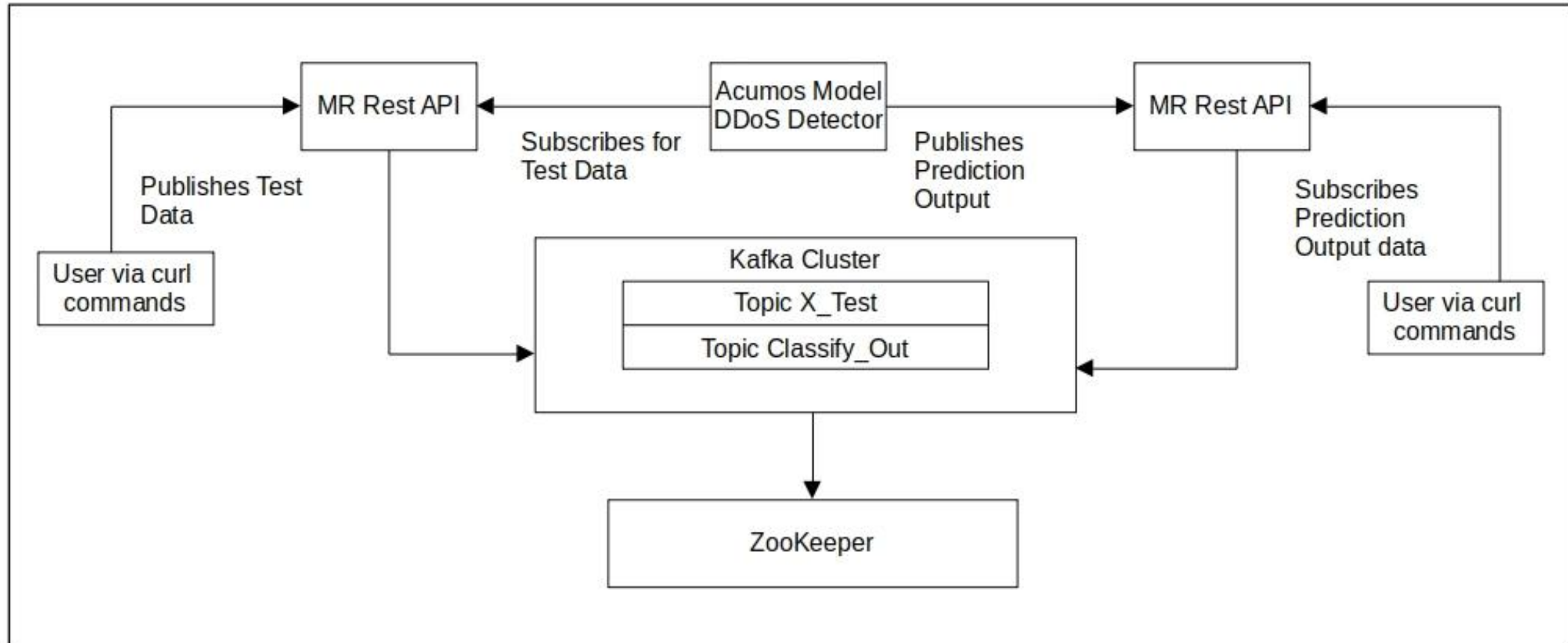
# Agenda

- Use-case Description
- Outcome of the Demo
- Stages and Components for Acumos-DCAE integration
  - Import Model into Acumos
  - Importing Acumos Model into ONAP
  - Create Process Flow and deploy it into DCAE Platform

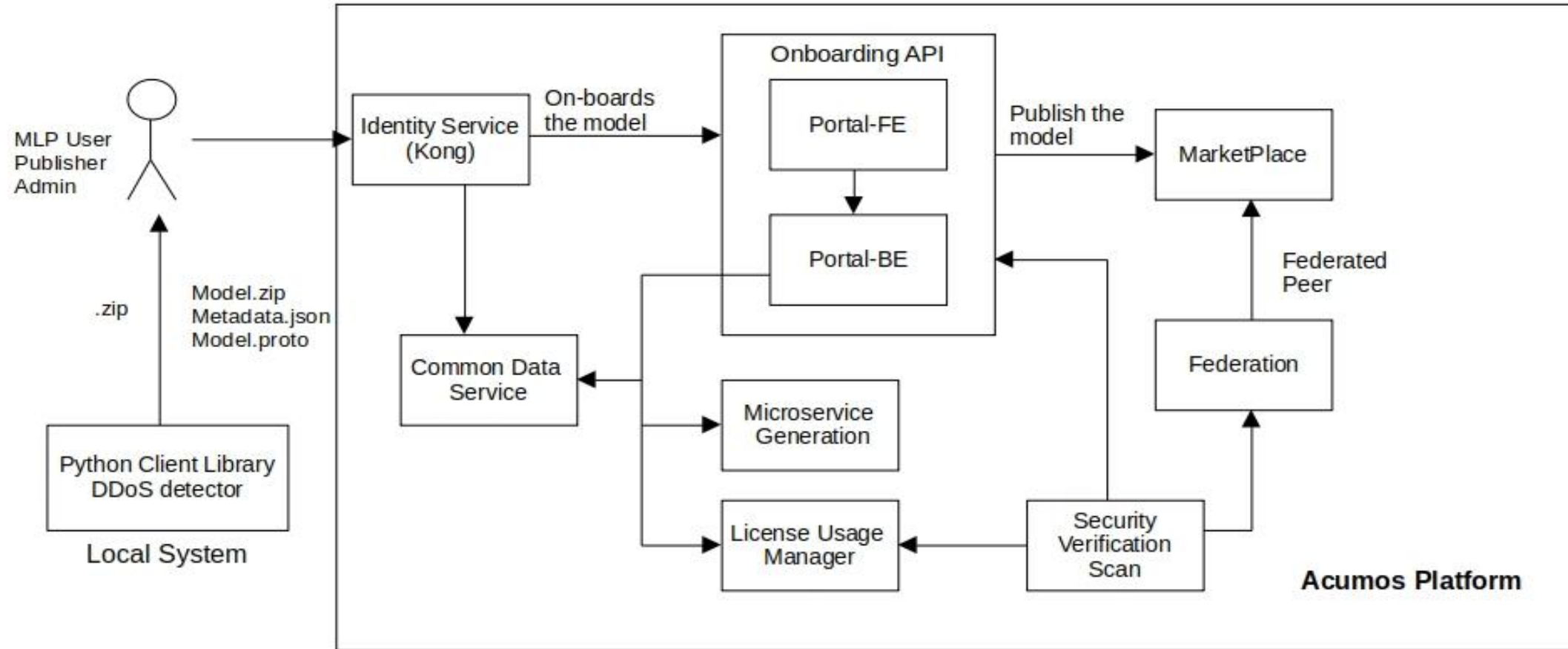
# Use Case: DDoS Detection

- A linear SVM classifier to classify between normal and abnormal traffic.
- Based on dataset NLS\_KDD available publicly for research and test purposes.
- Binary classification with output 0 for normal traffic and 1 for abnormal(Botnet) traffic.
- Tools/Libraries Used:
  - Scikit-learn - 0.23.2
  - Numpy - 1.19.2
  - Acumos python client library: 0.8.0
  - Python - 3.6.9
- Note 1: This model has been developed solely for demonstration of an end to end use case of using ML models in ONAP with the aid of Acumos. The performance evaluation of this model is out of scope.
- Note 2: This python model will be converted into an ONAP -DCAE component by the Acumos-DCAE adapter. However it will be running only as a standalone service without connection to other DCAE components such as VES collector because of lack of devices producing meaningful data. As a result of real-time data insufficiency, proper flow between components cannot be created into Kafka and hence a working design flow cannot be created. Nevertheless, converting the python-based Acumos model into ONAP compatible and deploying it as a standalone service in the DCAE platform will be demonstrated.

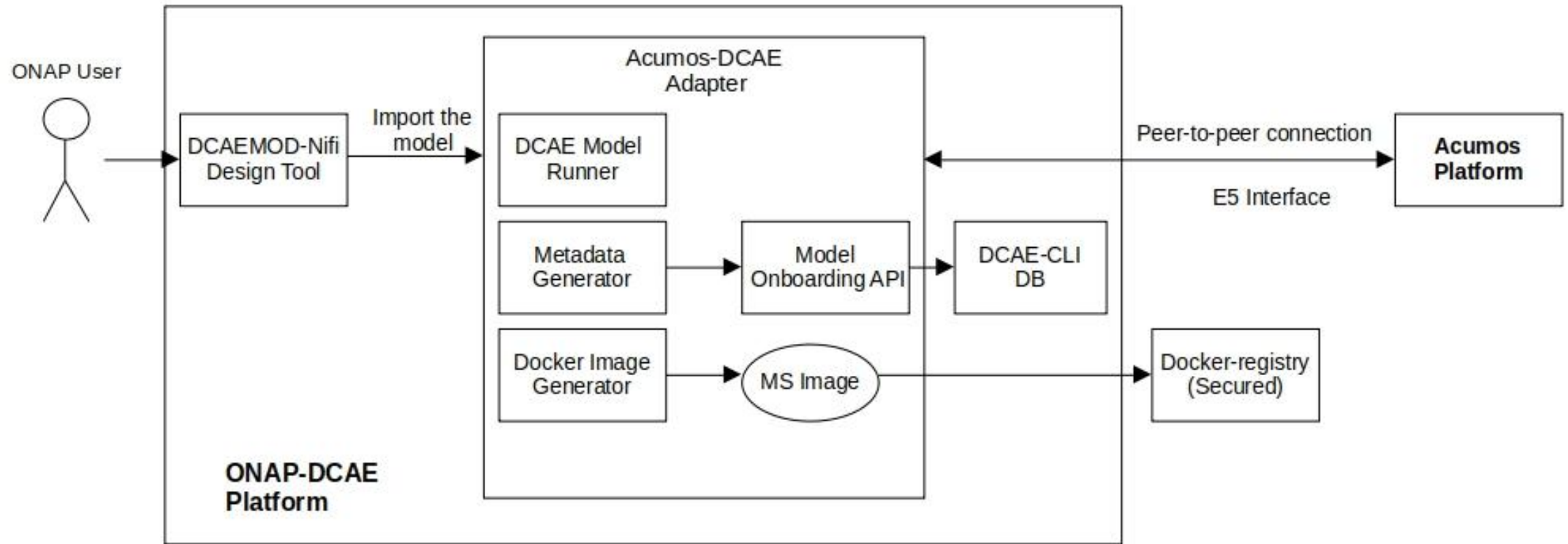
# Acumos Model as a Service(Standalone)



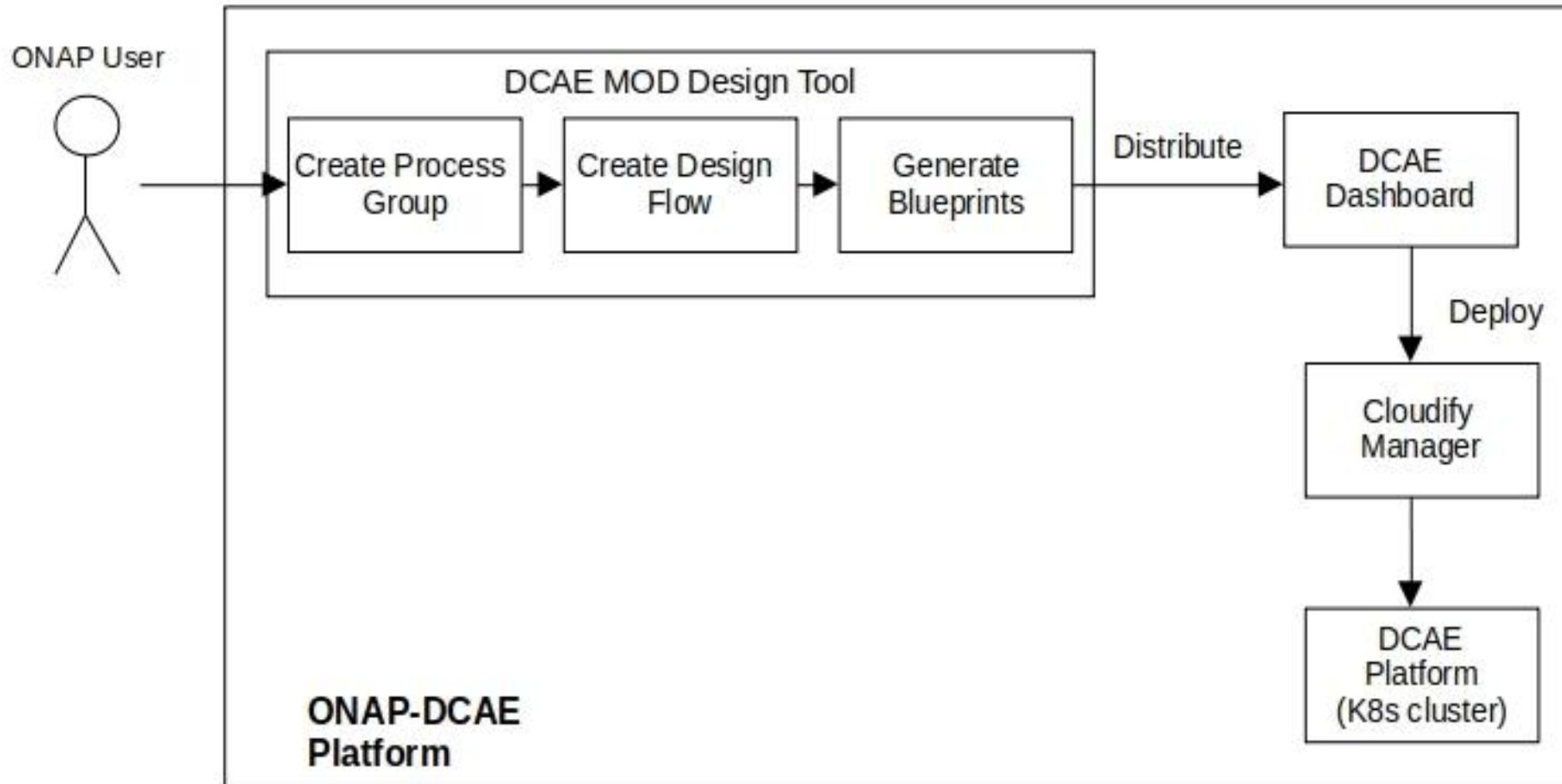
# Import Model into Acumos



# Import Acumos Model into ONAP



# Create a Process Flow and Deploy into DCAE platform



- DMaaP - Data Movement as a Platform is a component that provides data movement services that transports and processes data from any source to any target.
- DMaap MR - Message Router is a reliable, high-volume pub/sub messaging service with a RESTful HTTP API. The service is built over Apache Kafka.
- Clients can use the Message Router endpoints to publish a message to a topic and subscribe to a topic.



# Thank you!

# Brief Introduction to Acumos

- Acumos is an Open Source Platform, which supports training, integration and deployment of AI models.
- Acumos empowers data scientists to publish adaptive AI models, without them needing to custom develop fully integrated solutions.
- It packages each model into an independent, containerized microservice, which is fully interoperable with any other Acumos microservice.
- Models built with any of the tools like Tensorflow, SciKit Learn, Rcloud, H2O or any supported language, including Java, Python and R, can be automatically on-boarded, packaged and cataloged.
- Allows any software developer to easily integrate these microservices into practical applications even without a background in data science or knowledge of any specialized AI development tools.

Source: [https://www.acumos.org/wp-content/uploads/sites/61/2018/03/acumos\\_open\\_source\\_ai\\_platform\\_032518.pdf](https://www.acumos.org/wp-content/uploads/sites/61/2018/03/acumos_open_source_ai_platform_032518.pdf)

- **A common open source AI platform**

- The framework can be downloaded from [gerrit-acumos.org](https://gerrit-acumos.org) and deployed on a desktop, data-center or cloud service as an Acumos instance.

- **Inter-operable Microservices**

- Provides a packaging function to wrap individual components, including models, adapters and public data sources into microservices

- **A distributed marketplace**

- Individual Acumos instances exchange solutions with each other or via a general public intermediary.

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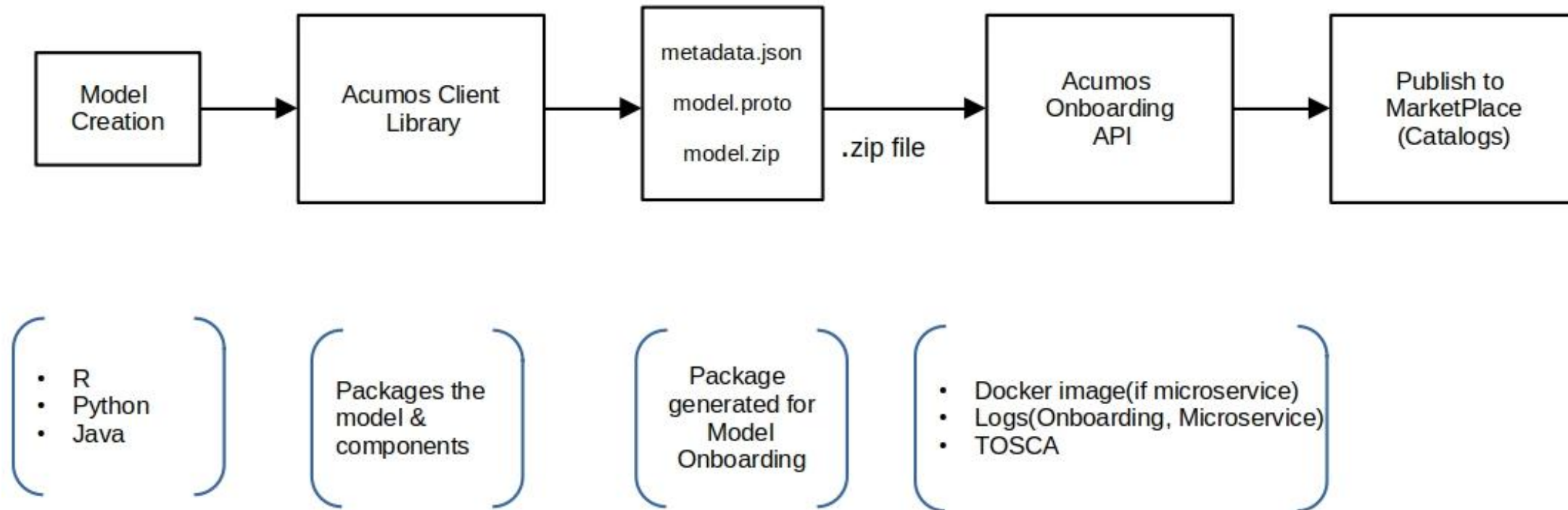
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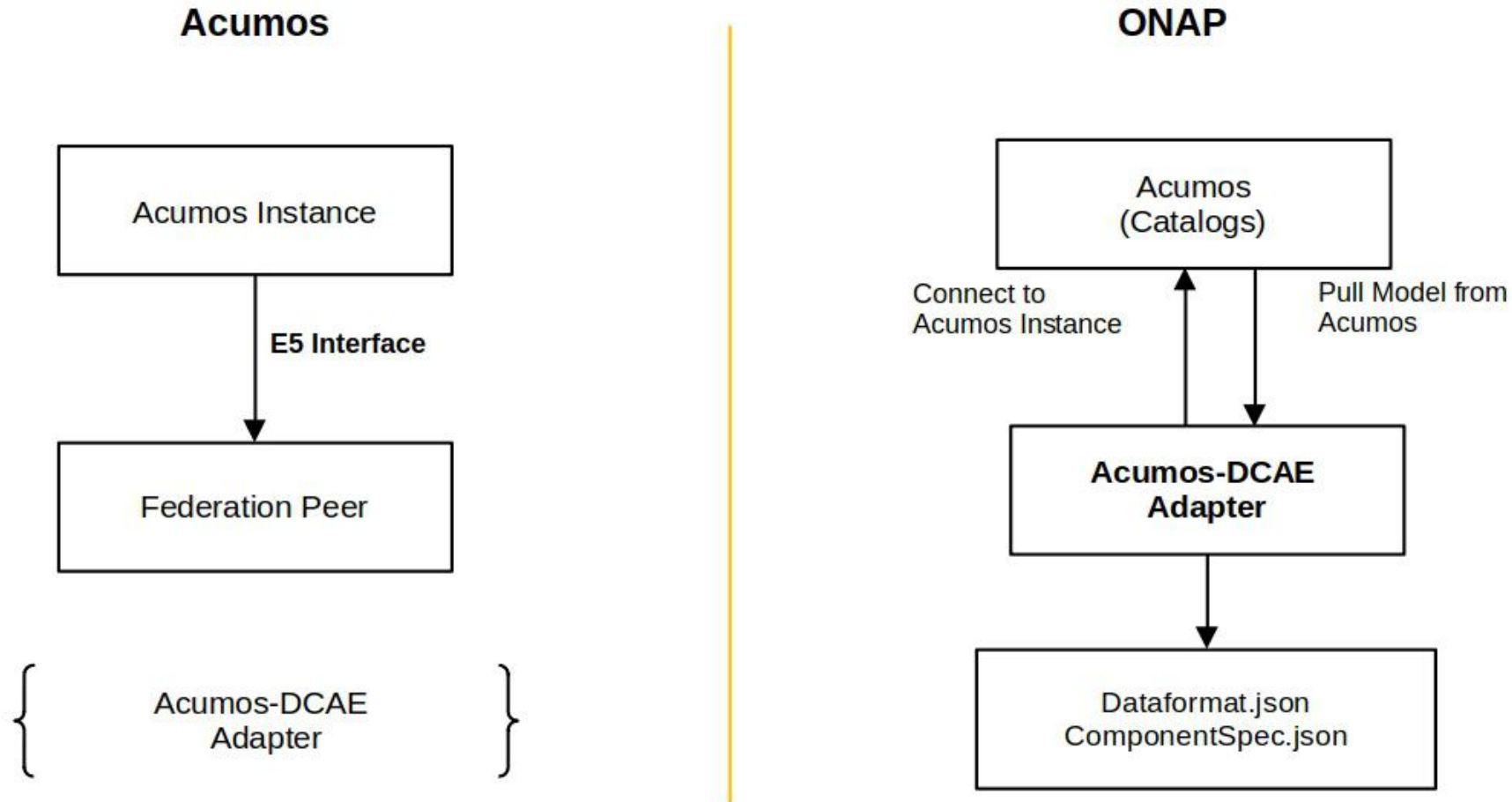
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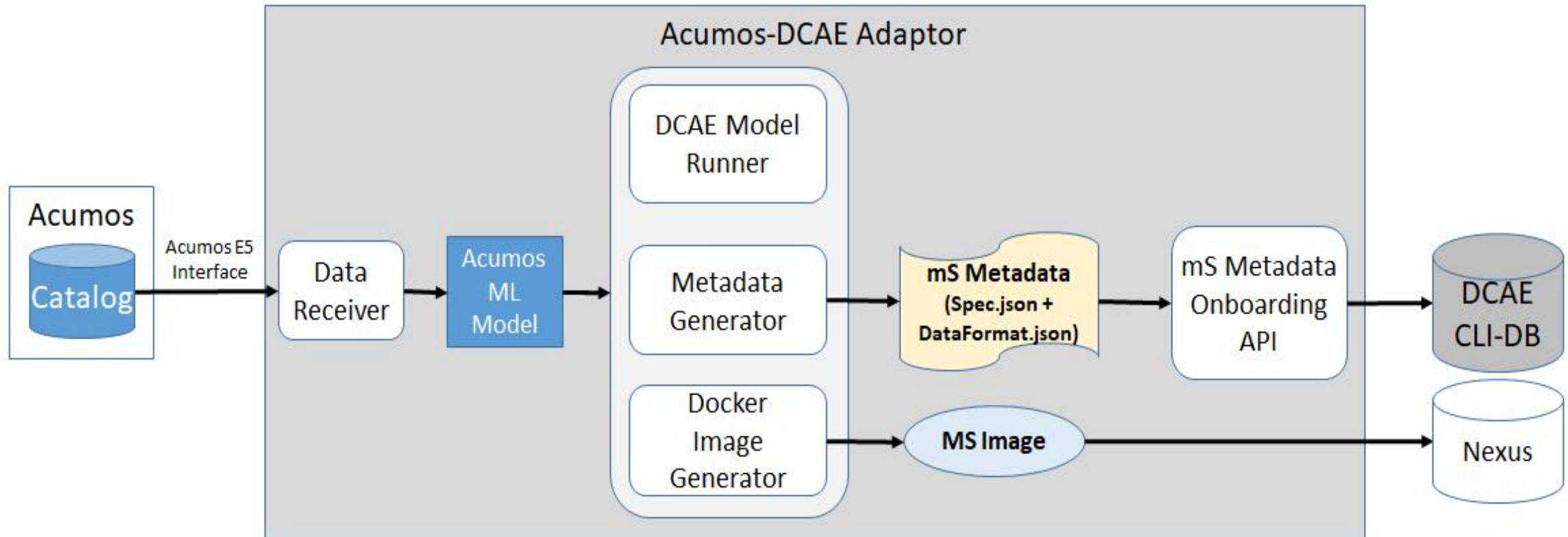
# Model Onboarding into Acumos



# Overview of Acumos DCAE Integration

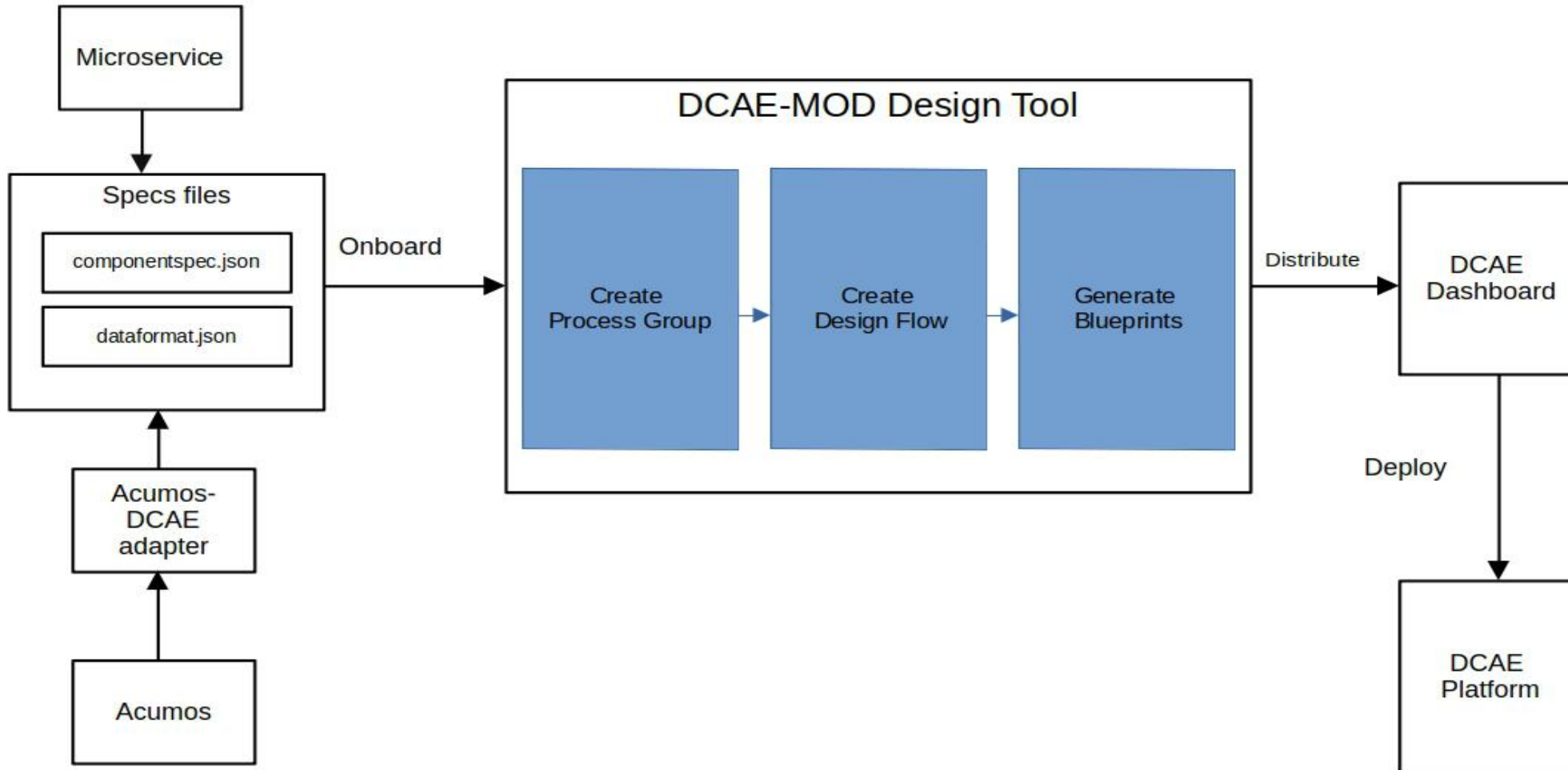


# Acumos-DCAE Adapter



Source: <https://wiki.onap.org/display/DW/Acumos+DCAE+Integration>

# DCAE MOD (Model Onboarding & Design)





# Sources and References

- Introduction to Acumos: [https://www.acumos.org/wp-content/uploads/sites/61/2018/03/acumos\\_open\\_source\\_ai\\_platform\\_032518.pdf](https://www.acumos.org/wp-content/uploads/sites/61/2018/03/acumos_open_source_ai_platform_032518.pdf)
- Acumos Wiki: <https://wiki.acumos.org/>
- Acumos Installation Guide(Clio Release): <https://docs.acumos.org/en/cli/submodules/system-integration/docs/oneclick-deploy/index.html>
- Acumos-DCAE Adapter:
- Overview: <https://wiki.onap.org/display/DW/Acumos+DCAE+Integration>
- Installation: <https://wiki.onap.org/display/DW/Acumos+Adapter+Installation>
- DCAE MOD:
  - Architecture: <https://wiki.onap.org/display/DW/DCAE+MOD+Architecture>
  - User Guide: <https://wiki.onap.org/display/DW/DCAE+MOD+User+Guide>
- DCAE:
  - Architecture: <https://docs.onap.org/en/casablanca/submodules/dcaegen2.git/docs/sections/architecture.html>
  - Helm chart based DCAE deployment(through OOM):  
[https://docs.onap.org/en/casablanca/submodules/dcaegen2.git/docs/sections/installation\\_oom.html](https://docs.onap.org/en/casablanca/submodules/dcaegen2.git/docs/sections/installation_oom.html)