

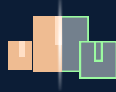


JFrog and Technology Innovation Institute (TII)

TII Fuels Autonomous Research Innovation, Unlocks CI/CD Automation at Scale with JFrog on AWS



Over 50% decrease
in build and deploy time



Tens of terabytes
Stored within Artifactory



24/7/365 High Availability
to support continuous deployments



Security built-in
to innovate fast while remaining secure

We selected JFrog Platform because we not only see it as a repository, but as a complete platform. In addition to Artifactory, JFrog offers a holistic end-to-end security solution..

Eugen Marin, Lead DevOps, Autonomous Robotics Research Center at TII

About TII

The [Technology Innovation Institute](#) (TII) is a leading global research center dedicated to pushing the frontiers of knowledge. Its teams of scientists, researchers, and engineers work in an open, flexible, and agile environment to deliver discovery science and transformative technologies.

TII is part of the Abu Dhabi Government's Advanced Technology Research Council, which oversees technology research in the emirate and consists of 10 research centers.

In TII's [Autonomous Robotics Research Center](#) (ARRC)'s division, Eugen Marin leads the DevOps team. Marin is responsible for ensuring a flexible and agile environment to support researchers and scientists focused on autonomous robotics projects.

The ARRC DevOps team responsible for setting up and managing the infrastructure and continuous integration and continuous delivery (CI/CD) pipelines. The hardware and software solutions developed within ARRC have applications in autonomous drones, cars, boats, and underwater devices hosted on cloud, hybrid, and on-premises environments.

Challenges: Scaling DevOps to support ever-growing innovation

Marin joined the ARRC team in August 2022 to set up the DevOps practice for the research center. At the time, ARRC had up to 150 scientists, researchers, and engineers, including external collaborators, working on autonomous robotics projects. Setting up a suitable build environment proved challenging to scale due to the fast rate of growth ARRC experienced.

“The problem was, the build environment may have been suitable for a specific project. As ARRC grew more and more, we realized we needed a unique approach. This meant defining the CI/CD process and identifying tools and platforms that not only met the teams’ and projects’ needs, but on the other side, properly integrate with each other as well,” Marin says.

ARRC colleagues were using Docker Hub as its repository, but as ARRC increased the number of users in just a year and a half to 300 users, licensing costs became a concern and Marin needed to find a more scalable solution with a small team DevOps engineers.

A key requirement for Marin in DevOps is high availability – the whole system must be running 24/7/365 due to the critical nature of supporting research projects within ARRC.

Solution: JFrog High Availability with Xray to automate security

The ARRC team evaluated solutions to support the ever-growing needs of researchers, and chose JFrog Enterprise X, deployed on ARRC’s Amazon Web Services (AWS) self-hosted environment.

ARRC began with [JFrog Artifactory](#) as it needed to store tens of terabytes of data, mainly consisting of Docker images, and this data also needed to be accessible and sharable to ARRC’s partners. ARRC needed to store artifacts in a reliable solution, but there was also more that needed to be addressed in terms of supporting ARRC’s growth.

Beginning with one instance, the ARRC team began piloting its research projects on JFrog, learning and adding more projects over time. Due to pressure on the instance, Marin decided to expand to three servers and introduce High Availability (available with Enterprise X) to support the team’s always-on commitments for availability. Further, Marin also evaluated how JFrog Platform could help ensure security across the software development lifecycle.

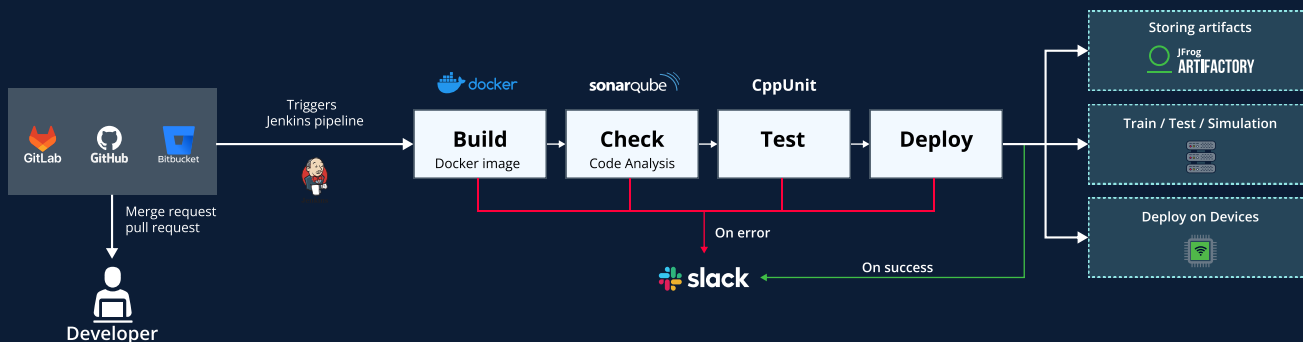
“We selected JFrog Platform because we not only see it as a repository, but as a complete platform. Aside from Artifactory, JFrog offers an end-to-end holistic security solution... We took security into account, and JFrog offers significant features in ensuring security for what we store and for our deliverables,” Marin explains.

ARRC implemented [JFrog Xray](#) as part of the overall solution – “now our pipelines not only include build, test, and deploy, but can scan Docker containers for security vulnerabilities,” Marin says.

In some scenarios, researchers use open source packages and libraries. By leveraging Xray, ARRC gets open source vulnerability scanning and license compliance to automate best practices for open source use cases and free up researchers to innovate with built-in security.

“This is another advantage because we provide a way for our researchers to get more information about the open source packages and libraries used that will help them make decisions,” Marin says. “We of course will not block the whole pipeline, but researchers and project managers will have this critical information to decide if further action is needed.”

DevOps Process



Results: Faster, more secure deployments with high reliability, freeing up even more innovative projects

By leveraging JFrog Platform, ARRC reduced build and deploy time by more than 50%, “which had a huge impact” according to Marin.

With security at the heart of ARRC’s DevOps, Marin’s team now has clear control of users both internally and with ARRC and TII external research partners. “JFrog offers a clear and smooth way to configure who has access and to where. This is our benefit from a DevOps perspective... we are able to separate binaries at a project level, which increases security,” Marin adds.

The team also experienced a significant increase in efficiency related to storage costs with Artifactory, as the team can use Amazon Simple Storage Service (Amazon S3) for storage.

Looking ahead, Marin’s ARRC team is helping represent the UAE with TII in the [Abu Dhabi Autonomous Racing League](#) (A2RL). With the inaugural race in April 2024 at the iconic Yas Marina Circuit in Abu Dhabi, the event marks the beginning of a series of autonomous vehicle races. The A2RL race will showcase Dallara Super Formula SF23 cars, currently the fastest open-wheel race car in the world after F1.

Using JFrog Platform “allows my team to play a crucial part in this cutting-edge research and development... Knowing our work directly supports advancements in this field is truly exciting and fulfilling because it’s not just about managing servers or implementing scripts; it’s about being a part of a team that’s pushing the boundaries.”

Products:

JFrog Artifactory
JFrog Xray
Amazon Web Services (AWS)

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ABOUT JFROG

JFrog empowers thousands of DevOps organizations globally to build, secure, distribute, and connect any software artifact to any environment using the universal, hybrid, multi-cloud JFrog Platform.



Start for free at <https://jfrog.com/start-free>

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