A brief Note on DevOps

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INTRODUCTION

Software Development (Dev) and IT Operations (Ops) are combined in DevOps (Ops). Its goal is to shorten the systems development life cycle and enable continuous delivery of high quality software. DevOps is a complement to agile software development, with numerous DevOps features originating from the agile approach.

Many of the ideas fundamental to DevOps practices are inspired by, or mirror, other well-known practices such as lean and deming's plan do check act cycle, up to the Toyota way and the Agile approach of breaking down components and batch sizes.

DESCRIPTION

Agile

The motives for what has evolved into modern DevOps, as well as some basic DevOps processes such as automated build and test, continuous integration, and continuous delivery, may be traced back to the agile culture of the 1990's, and formally to 2001. Unless they swallowed the operations/infrastructure tasks connected with their applications, many of which they automated, agile development teams utilising methodologies like Extreme Programming couldn't "satisfy the client through early and continuous delivery of valuable software." Because Scrum became the dominant agile framework in the early 2000's, it removed the engineering methods that many agile teams used, the drive to automate operations and infrastructure services separated from Agile and grew into what is now known as modern DevOps.

ArchOps

ArchOps is a DevOps extension that starts with software architectural artefacts rather than source code for operation deployment. Architectural models are first-class entities in software development, deployment, and operations, according to ArchOps.

CI/CD

Automation is a key component of DevOps success, and CI/CD is an important part of that. Continuous integration (CI) and Continuous Delivery (CD), or continuous deployment, are the two components of CI/CD (CD). The three

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processes, when used together, automate build, testing, and deployment, allowing DevOps teams to ship code changes more quickly and reliably. When people talk about CI/CD, they usually mean continuous delivery, not continuous deployment. Continuous delivery and other CI/CD methods focus on automating software delivery chores, whereas DevOps focuses on organizational change to allow outstanding collaboration among the various functions involved. Both have a history in agile methodologies and lean thinking, with a focus on modest, frequent changes that add value to the end consumer. This ensures two things: software remains in a releasable condition throughout its lifecycle, making delivery less expensive and risky.

Improved collaboration and communication between and within teams also contributes to a faster time to market and lower risk.

DataOps

DataOps refers to the application of continuous delivery and DevOps to data analytics. DataOps aims to combine operations with data engineering, data integration, data quality, data security, and data privacy. It uses DevOps, agile development, and statistical process control techniques from lean manufacturing to reduce the time it takes to extract value from data analytics.

Site reliability engineering

Site Reliability Engineering (SRE) was created by Google in 2003 as a method for regularly introducing new features into large scale high availability systems while preserving a high quality end-user experience. While SRE predates the birth of DevOps, the two are often considered to be connected.

Toyota production system, lean thinking, kaizen

With its focus on continuous improvement, kaizen, flow, and small batches, the Toyota production system, also known as TPS, was the inspiration for lean thinking. TPS is the source of the andon cord idea, which is used to provide fast feedback, swarm, and solve problems.

DevSecOps, shifting security left

DevSecOps is a DevOps add on that allows security measures to be integrated into the DevOps methodology. Unlike a typical centralized security team, each delivery team has the authority to incorporate the appropriate security controls into their software delivery. As a result, the phrase "shift left" can be used to describe how security procedures and testing are carried out earlier in the development lifecycle. There are three types of security tests: static, software composition, and dynamic. Static Application Security Testing (SAST) is a type of white-box testing that focuses specifically on security. Different tools are required for static code analysis depending on the programming language. The software's components, particularly libraries, are examined, and their versions are compared to vulnerability lists published by CERT and other expert groups. When distributing software to clients, attention is paid to licencing and their compatibility with the programmer being given, particularly copy left licenses. Black-box testing is another name for dynamic testing. Without knowing how the software works, it is put to the test. On the one hand, it's known as dynamically (DAST) or penetration testing in DevSecOps. The purpose is to detect issues such as cross-site scripting and SQL injection early.

The open web application security project, for example, publishes threat kinds, such as its TOP 10. On the other side, Interactive Application Testing (IAST) is useful, especially with micro services, to inspect which code is executed when performing automated functional tests, with the focus on detecting vulnerabilities within the applications. IAST, unlike SAST and DAST, operates within the application. Runtime Application Self-Protection (RASP) is similar to IAST in that it operates inside the application. Its instrumentation focuses on detecting vulnerabilities during productive execution, rather than during test cycles. Attacks can be actively stopped or reported by monitoring and alerting. RASP alerts aid in the management of security data and events (SIEM).

Building a DevOps culture

IT and organizational performance are strongly influenced by organizational culture. DevOps emphasizes cultural norms like as information flow, collaboration, shared duties, failure learning, and new ideas. To develop this communication and cultural transformation within an organisation, team-building and other employee engagement activities are frequently used.

CONCLUSION

DevOps as a service enables developers and operations teams to gain more control over their applications and infrastructure without slowing down. It also shifts the responsibility for an issue to the development team, making them far more cautious in their approach.

The top seven measures with the strongest association to organizational culture, according to the 2015 state of DevOps report, are:

- Investment by the organisation.
- Experience and effectiveness of team leaders.
- Consistent delivery.
- The ability of various disciplines (development, operations, and information security) to work together to produce win-win outcomes.
- Organizational effectiveness.
- Painful deployment.
- Practices of lean management.