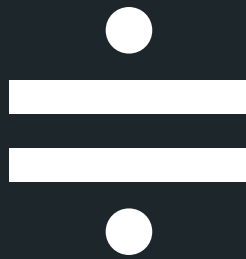


INTEGRATED DELIVERY



WHITE PAPER UK

≡ Solvinity[®]
Secure Managed IT Services



Content

Accelerate and improve the software release process	3
The delivery model: CI/CD	4
The collaboration model: <i>Stretched</i> DevOps	5
The implementation model: CI/CD Platform Portfolio	7
Integrated Delivery for software developers	9
Integrated Delivery in practice	10
About Solvinity	13

In IT today, software projects that take months to develop are no longer feasible. Increasing competition from super fast start-ups, rapidly changing laws and regulations and societal developments require speed and flexibility. This is already challenging enough for organisations where all of the IT is run internally – but what if development and operations are separated? How can you then set up the coordination between all of the departments in the various organisations in such a way that you retain the speed that the business requires? The answer: Integrated Delivery.

Accelerate and improve the software release process

Integrated Delivery is a software release model for organisations that have outsourced their IT infrastructure and management, but release their own new software on a regular basis.

The goal is to deliver new functionality together in a manner that is more predictable, more secure and faster.

Integrated Delivery is constructed out of three models:

1. **The delivery model: CI/CD**
2. **The collaboration model: *Stretched* DevOps**
3. **The implementation model: CI/CD Platform Portfolio**

Integrated Delivery entails automation of the entire release process according to a standard portfolio of services, platforms and tools. All of the parties involved, internal as well as external, work together in an optimal manner: not only developers and administrators, but also the business, end users and security employees are involved. The integration of CI/CD, *Stretched* DevOps and the Platform Portfolio ensure that new functionality is high quality and can be marketed in a controlled, secure and fast manner.



1. The delivery model: CI/CD

The delivery process is automated in order to be able to market new software in a fast and controlled manner:

Continuous Integration / Continuous Delivery (CI/CD).

The goal of **Continuous Integration (CI)** is to integrate and test, in an automated manner, the various software components of each next release so that errors are found and corrected at an early stage. The goal of **Continuous**

Delivery (CD) is to bring new functionality into production in an automated manner. The software must be able to integrate with the existing operational components and must satisfy non-functional conditions such as availability, scalability, security, manageability, continuity, etc. The diagram below (Figure 1) shows the standard activities within the CI/CD process for the continuous integration and delivery of new software.

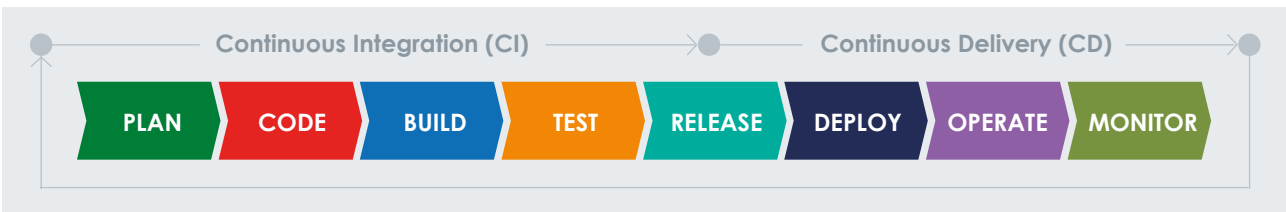


Figure 1. Standard CI/CD activities

The key word in the CI/CD process is *continuous*. The ability to continuously integrate, test and roll out software requires significant automation in order to maximise the reduction in human operations and handovers. That is why the path that a release takes is established in code. This has considerable consequences for the architecture and technology to be used, but particularly for the required mindset and expertise of the employees involved. The whole team is responsible for the entire chain. Each team member contributes to the improvement and acceleration of the delivery process. The planning of new functional and non-functional requirements with the business and

the management department is also part of the CI/CD process. The success of a release is monitored and this output becomes the input for the planning process at the beginning of the chain. With that, the loop is closed and CI/CD has become a continuous delivery process. This process is often drawn as a series of consecutive activities. In practice, however, the team is not working in phases, but is continuously working on CI/CD activities. These activities must then also be continuously adjusted and that is what Solvinity means by "Integrated". Figure 2 provides a visual depiction of this difference.

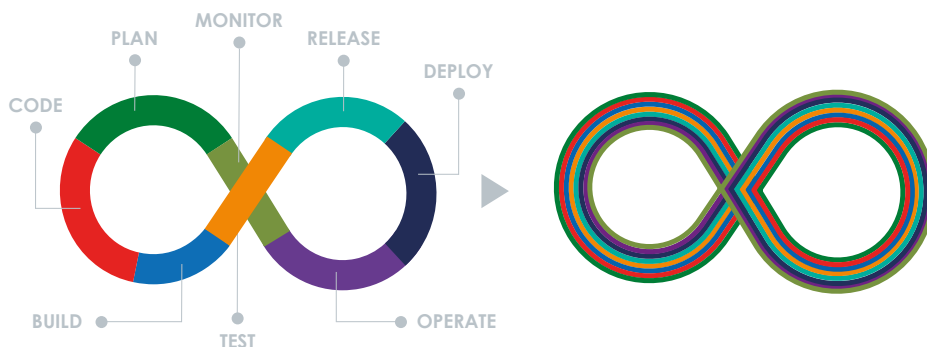


Figure 2. From phased to integrated CI/CD activities

2. The collaboration model: *Stretched DevOps*

Integration is easier said than done, especially in situations where Dev and Ops are performed by different parties. The CI/CD delivery process and the introduction of modern tooling and (microservice) architecture principles require significant initial transfer of knowledge. In such a situation, a new way of working together is necessary, one that “extends” over company walls. One dedicated team that focuses completely on the objective of Integrated Delivery: delivering new functionality together in a predictable, secure and fast manner. For this purpose, Solvinity developed the “Stretched DevOps” collaboration model.

In a Stretched DevOps team, there are no longer any company walls within the organisation (our client) or between the organisation and external parties: everyone works together in one team. In order to be able to properly facilitate the speed, communication and knowledge transfer, the collaboration preferably takes place at our client’s location. This is not only

for the operational IT team (Dev and Ops), but also for the employees who are responsible for the provision of service and planning at tactical level and the strategic development (business). The end user (representative) of the product or service is consulted on a regular basis in order to determine whether the product still satisfies the requirement. Security is also continuously included in the developments so that the security is assured from the beginning.

But “Stretched” means more than working together horizontally “over company walls” (see Figure 3). It is above all, the continuous collaboration, learning and evaluating with all of the parties involved. For example, Ops does not take action only after the developer has tested and integrated his or her code. That would undermine the whole idea of CI/CD. Everyone remains continuously involved and participates in an agreed upon team cadence and ritual of planning, (daily) coordination, testing, demonstration, delivery and learning.

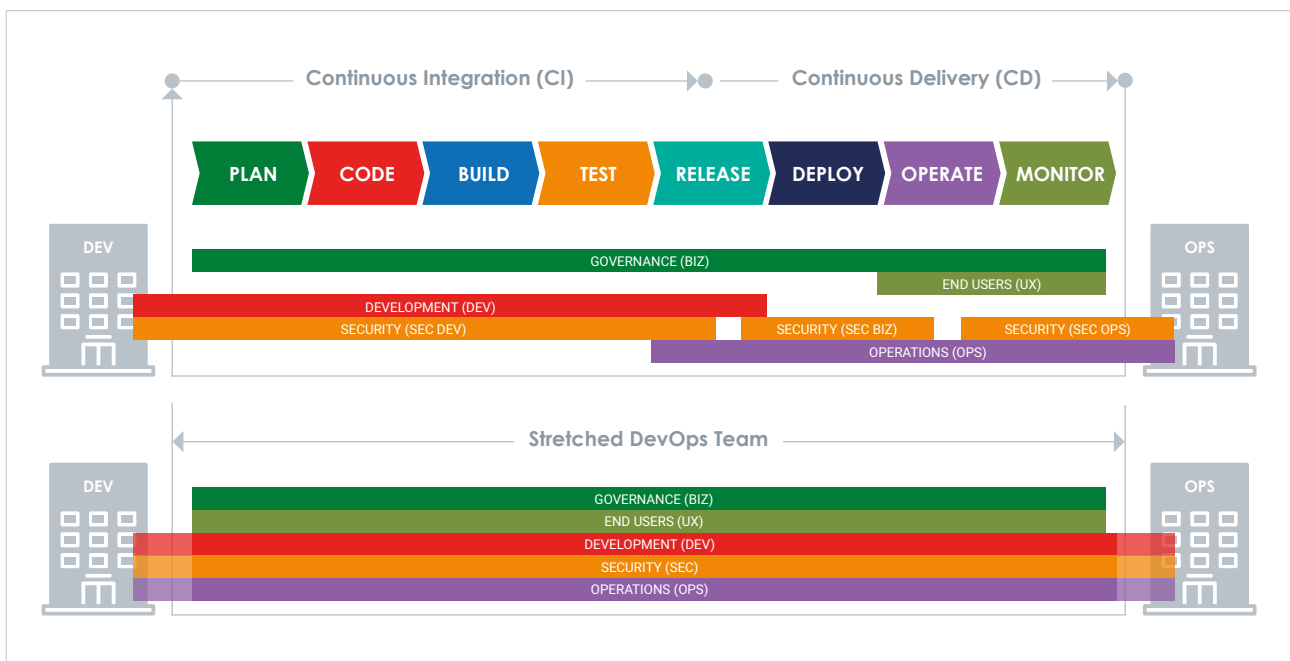


Figure 3. From DevOps to Stretched DevOps

Handovers must be avoided as much as possible in the mutual communication in order to realise the target time-to-market. The collaboration is therefore supported by standard collaboration tools that offer at least secure online meeting and chat capabilities, as well as shared documentation management. For this purpose, relevant information is available for everyone, anytime and anyplace, and barriers to act as one team are removed.

Agreements are also made regarding the measurement and remuneration of the team performance. In addition to "strict" KPIs regarding the availability, delivered functionality and predictability of the time-to-market, the team is managed via "softer" factors, such as end user satisfaction and cooperation. For this purpose, Solvinity applies the Garte [Experience Level Agreement \(XLA\)](#) as a resource.

Characteristics of Stretched DevOps

- One team with one shared goal: to deliver new functionality together in a predictable, secure and fast manner
- Continuous involvement of all parties involved, including as standard, development, operations, business, security and end users
- Physical meetings at the client's location
- Fixed team cadence and rituals (events, meetings and the like) for everyone
- Maximum facilitation of knowledge transfer and reduction of handovers and third party dependencies
- Evaluate and learn together
- Management through an XLA on "strict" KPIs as well as "soft" factors

3. The implementation model: CI/CD Platform Portfolio

Complex technical infrastructure, platform facilities and tools are necessary in order to guarantee the delivery and collaboration. Solvinity has put together the CI/CD Platform Portfolio for this purpose (see Figure 4). Solvinity manages, integrates and secures this portfolio and with that, guarantees the delivery of new functionality. The CI/CD Platform Portfolio consists of a standard set of integrated tools (among others, Gitlab CI, Docker, Kubernetes, Rancher, Twistlock, Grafana) that can be gradually expanded in consultation with the client.

The basis of the CI/CD Platform Portfolio is formed by secure and scalable “Infrastructure Services” with fast and secure connections to the client and external parties. This can occur within Solvinity’s private cloud as well as the public cloud, or a hybrid format.

In addition, the Platform Portfolio contains “Persistent” and “Non-persistent” Services. Persistent Services are facilities that must be continuously available, for example, for the storage of data in a database or static content such as photos. Non-persistent services are services that are temporarily active, for example, a container with software for the execution of a vulnerability scan. Persistent Services are services for which other KPIs are applicable and that differ from Non-persistent Services in terms of monitoring, capacity management and invoicing.

The last component of the Platform Portfolio consists of the “Data Collections”. Important Data Collections, such as code, images, packages, keys and log data, are stored and opened via the Persistent Services.

The CI/CD Platform Portfolio is delivered in phases according to “delivery plateaus” that have been established collectively in advance. The first delivery plateau, for example, is the base container platform with a static website as first application. A second delivery plateau is a complex application with load balancing, DDoS protection, etc. A rapid delivery of the base container platform and the release of a first (small) application reinforces the knowledge transfer between Dev and Ops. Thus, the CI/CD platform itself is also expanded incrementally.

A CI/CD Platform Portfolio requires continuous portfolio management. The developments in the CI/CD (tool) environment proceed quickly and new tools must integrate with existing facilities. Aspects such as manageability, security, scalability and price must also be continuously considered. That is why the Solvinity CI/CD Product Owner is always involved in the Stretched DevOps team.



Figuur 4. Solvinity's CI/CD Platform Portfolio

Integrated Delivery for software developers

Integrated Delivery enables organisations to market new functionality in a predictable, secure and fast manner. The mainstays are the introduction of a CI/CD process based on a Stretched DevOps collaboration model and the delivery, management, integration and securing of a portfolio with standard CI/CD solutions, such as Kubernetes, Docker and Twistlock, expanded with client-specific modules.

In the past, developers worked for months on a release. Smaller releases are delivered with Integrated Delivery. Because the parties involved work together on the client's site, the knowledge transfer proceeds more smoothly and actions

can be made as one team. The result is fewer complex integrations, less testing time, better user adoption and a simple repair procedure if something does go wrong.

Customers indicate that Integrated Delivery leads demonstrably to a better quality and faster release process. For example, the introduction of Integrated Delivery led to a saving on the infrastructure costs (up to 40% on compute), a faster time-to-market (from quarterly to weekly or daily releases) and the introduction of new flexible pricing models for the client (pay for use). There are corresponding examples available in practice in the public, semi-public and financial sectors.

Workshops

The introduction of the new way of working, the impact on architecture and the use of automated, rather than manual, delivery pipelines and testing tools require attention. That is why, for a smooth implementation, Solvinity always holds multiple workshops on site with Dev and Ops during the introduction and the use of the new CI/CD platform.

Integrated Delivery in practice

Solvinity has extensive experience in building, securing, integrating and managing CI/CD platforms within the private as well as public cloud, in the triangle of client, (software) provider and management organisation. We provide a number of examples for illustration purposes.

Innovative Housing Portal Platform Zig Websoftware

Zig Websoftware develops user-friendly web applications for housing corporations. Currently, more than one million Dutch people use the Zig solutions when looking for, finding and using rental housing.

Zig focuses on innovative solutions that incorporate smart working and the avoidance of paper flows. Zig is also convinced that extensive digitalisation contributes to the use of relevant data and in that way, helps to recognise client needs.

Zig, instead of developing mainly client-specific customised environments, wanted to be able to produce faster new solutions based on a standard CI/CD platform. Solvinity was already Zig's hosting partner. Together with the Zig engineers, Solvinity developed a scalable, secure and extremely reliable platform: Hexia. Integrated Delivery was used in the development: a combination of CI/CD, DevOps and a continuous improvement and expansion

of the underlying container platform and corresponding management, collaboration and security tools.

Integrated Delivery at Zig led to higher quality, time savings on management, a shorter time-to-market and lower costs through higher efficiency and good scalability, which adapt to the client's needs. Gerbert Kooij, General Director at Zig Websoftware, is very enthusiastic about the Integrated Delivery model. He sees an enormous quality potential in the concept with a large impact:

"Very few parties can do this. This model has the solution that also enables continuous delivery of high quality solutions in the future."



Marketing Campaign Platform Corporate bank

Solvinity developed a CI/CD platform for the corporate bank marketing department with which fast and secure marketing campaigns can be launched. The platform is also used to test Proof of Concepts (PoCs) in practice.

Campaign sites must generally be marketed quickly. This requires intensive collaboration between the delivering parties (various marketing agencies), the bank's marketing department and the client team at Solvinity. This type of site often has an unpredictable and short peak load, for example, campaigns during events such as European and world Championships. The corporate bank thought the old on-premise platform was not future-proof and insufficiently scalable in order to be able to deal with this situation.

The variable character of the load makes the public cloud, along with the flexible technical and financial advantages that it offers, exceptionally suitable as platform. That is why Solvinity built the Marketing Campaign Platform (MCP) within the Azure cloud. Azure Kubernetes Services (AKS) was applied as the core of the container platform. Configuring AKS, instead of self-installing a Kubernetes cluster, ensured a fast delivery.

Slack Premium was used for the collaboration between the various parties, while the Microsoft Azure PaaS

services were applied for databases and key management. As the sites have links with the bank's back office environment, much attention was paid during the construction of the MCP, to guaranteeing security controls. Monitoring and (security) management facilities were provided from the Solvinity CI/CD Platform Portfolio.

The result is a secure, scalable and future-proof Marketing Campaign Platform based on CI/CD in Azure. A "Minimally Viable Product" version was delivered in three weeks. The total project to onboard all of the marketing applications and to guarantee the compliance took approximately three months.

The corporate bank indicated that it is particularly satisfied with the ease and the speed with which new campaign sites become live in an automated manner, the control that the marketing department has within the release process (the marketing department approves the go live within the workflow) and the platform's ability to scale up and down.



Web Application Hosting Platform Politie Nederland

Many of the services that Politie Nederland (Dutch National Police) offers online have a direct impact on the community. For example, making a report or a statement, making an appointment with the local police officer or obtaining information about the safety of your neighbourhood. Politie Nederland wants to serve its citizens in this way as well as possible and is continuously working on improving the online provision of service.

To further develop their online services Politie Nederland wanted to:

- accelerate the release process of new functionality;
- enable innovation with efficient microservices architecture;
- simplify management of the development environment and toolin.

Cooperation and shared responsibility was of utmost importance for Politie Nederland. For this purpose, it set aside the traditional relationships and entered into a partnership with Solvinity in a Stretched DevOps collaboration with innovative technology. This partnership was new and challenging for Politie Nederland, but extremely valuable.

A multi-tenant container platform was established for Politie Nederland in Solvinity's private cloud, on which multiple parties within the Politie websites, web applications and microservices can host. This solution uses Kubernetes as container orchestration tool, Rancher as Kubernetes user interface and management tool, Helm as application packager and Twistlock (part of Palo Alto) for container security.

Solvinity also set up the development infrastructure with all corresponding tooling, with tools such as GitLab, Nexus and SonarQube for software development and tools such as Jira (issue management), Confluence (documentation) and Mattermost (on-premise chat

solution) for the collaboration. Solvinity was responsible for the technical management and the lifecycle management, freeing Politie Nederland to focus on their activities on developing applications.

The platform is opened via the Akamai CDN, as a result of which the availability of the Politie Nederland services is guaranteed, also when there are sudden large quantities of visitors. A higher level of security also resulted from the application of DDoS mitigation, a Web Application Firewall, an Intrusion Prevention System and network isolation within Kubernetes.

Solvinity, in collaboration with the Politie developers and testers, set up a CI/CD pipeline with which the entire production process is automated from software development to go live, including functional, technical, security and performance testing and the corresponding quality gates. This setup drastically reduced the time required for a release. In addition, the option will exist for "story-based" release (bring functionality into production as soon as it is ready), instead of waiting until an entire sprint to be completed. As a result, the time-to-market for new functionality can be reduced even further.

Solvinity engineers work closely with the Politie Nederland teams, often on site. There is a Stretched DevSecOps team established in which Solvinity and Politie take joint responsibility for the development, security and management of the Politie applications.



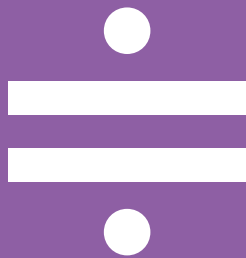
About Solvinity

Solvinity develops innovative client-orientated solutions and offers companies with strict security requirements secure access to the private, public and hybrid cloud. Solvinity specialises in cloud services for managed hosting, analytics, workplace and security. Under the motto 'Secure and compliant by design', Solvinity is certified according to international and Dutch standards, such as ISO 27001, ISO 14001, ISO 9001, ISAE 3402 type II, SOC 2 and NEN 7510. Its annual turnover in 2018 was € 46.8 million. The company has over 240 employees in the Netherlands. For more information go to www.solvinity.nl, or follow Solvinity on [Twitter](#) and [LinkedIn](#).

Want to know more about Solvinity?

Contact us! Call **+31 (0)20 36 43 600**

or mail us at info@solvinity.com



 **Solvinity**[®]
Secure Managed IT Services

Solvinity B.V.
Postbus 23673

1100 ED Amsterdam
T +31(0)20 364 3600

E info@solvinity.com
solvinity.com