

The background of the entire page is a photograph of the Golden Gate Bridge in San Francisco, California, taken during sunset. The bridge's iconic red-orange towers and suspension cables are silhouetted against a warm, orange and yellow sky. The water of the bay is visible in the foreground, with some dark rocks in the lower corners.

**The Flux7 Enterprise
DevOps Framework**

White Paper

The Flux7 Enterprise DevOps Framework

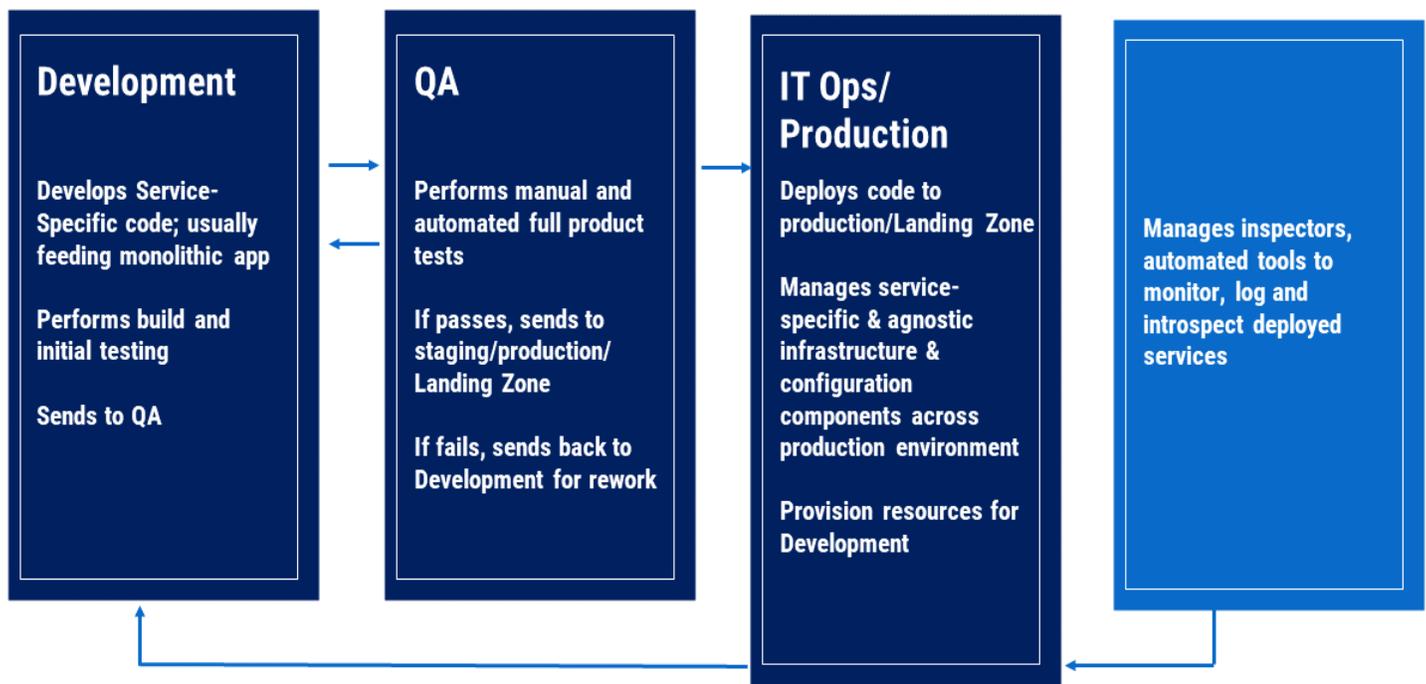


Collaborating with hundreds of companies over the years as they have gone through the DevOps transformation process has put us in a unique position to understand our customer's challenges and opportunities when it comes to IT modernization. In the process of helping them to evolve their systems and people to achieve an unprecedented level of agility with their IT systems, we've learned the patterns that emerge in the DevOps journey and where most people land and/or have the vision to land. We'd like to share that journey with you and provide some examples of how advanced cloud services can provide greater, truly transformative efficiencies and reduce dependencies on third parties.

To understand where we are going, however, it's helpful to understand where we've been. Following is a view of a more traditional IT framework; from here we can compare and contrast the Flux7 Enterprise DevOps framework (EDF), a model for marrying DevOps process improvement with digital transformation.

Cyber threats have shaken the headlines lately. From ransomware to DDoS attacks, security incidents are on the rise. In 2016, IDG detected 38% more cybersecurity incidents than the year prior. And, the cost of these incidents is on the rise as well, with the global cost of cybercrime predicted to reach \$2 trillion by 2019, from \$500 billion in 2015. IBM's Ginni Rometty summed it best when she said, "Cybercrime is the greatest threat to every company in the world."

Traditional IT Operations



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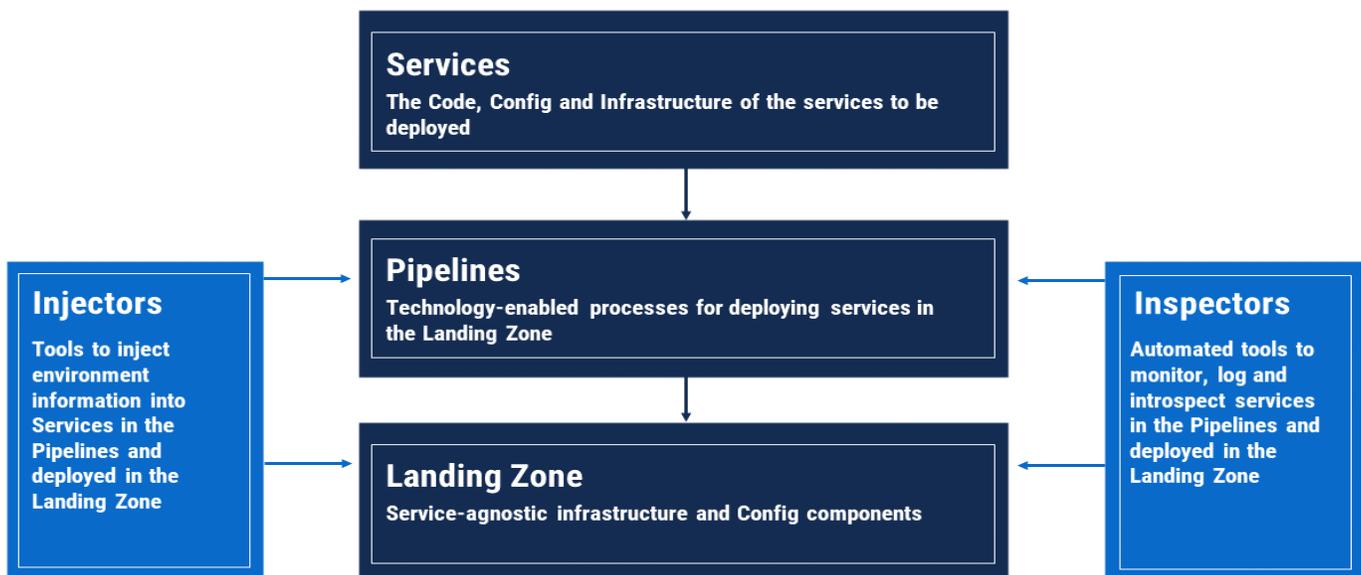
Balancing Perspectives

In a traditional development-IT operations framework, application teams are primarily in charge of their own code that is to be deployed. There is a QA release team that often works in the middle of the application release process. Once they are finished testing code, they hand over the code artifacts to the IT operations team for release to production. In this model, the IT operations teams are in charge of all service agnostic components, such as the data center and networking, as well as service-specific components like getting a mySQL 5.0 database up and running before an app can be deployed. Traditionally, all application dependencies are the responsibility of IT operations.

As you can see from this graphic, inspectors refer to those items that need to be checked and monitored within the environment. In this traditional IT framework, inspectors are primarily related to production monitoring of system metrics like CPU or memory.

The Flux7 EDF

In contrast to the traditional IT Model is the Flux7's EDF:



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In line with DevOps tenets, this framework is focused on helping development and IT Operations execute at full speed with minimal dependencies to achieve specific business goals. If technology is core to your business, streamlining and automating service delivery without third party MSPs, cumbersome processes and delayed provisioning is not an option. This new framework is often a significant change for service teams, with these teams being asked to own more and more. In this new DevOps-driven model, the service code and all its relevant dependencies are owned by the service team. This allows the service team to move faster as they have fewer dependencies.

Similarly, in the EDF, the traditional IT operations team is converted into a concept called the Landing Zone. The Landing Zone is where services deploy and as a result is focused on catching service agnostic components as they are delivered via pipelines. (Pipelines are processes designed specifically to automate the delivery of services into the Landing Zone.) In the EDF, the concept of a service-agnostic Landing Zone is very critical as is the idea of service teams owning more of their dependencies.

In this new model, inspectors also play a role, but they now have two jobs. They inspect components:

- As they move through the pipeline. This more traditional inspection includes things like security and audit checks.
- Once they are running in the Landing Zone for image analysis on a container to check for available software on your container. This secondary level of inspection gives you a whole new level of security and vulnerability analysis not typically done in virtual machines.

As organizations modernize their computing systems through DevOps based cloud approaches, a new way to govern systems is needed.

Service Teams Move Faster with Advanced Services

In the EDF, Service Teams own not just code, but also things like configuration, infrastructure, and everything specific to the services they create. With the use of automation in the form of configuration solutions like Chef, Puppet or Ansible, service teams can efficiently deploy and manage AWS environments in a safe, compliant and repeatable manner.

Moreover, advanced AWS services like CloudFormation make it easy – with the use of templates – to create and manage AWS resources, provisioning and updating them as easily as one-click. And solutions like HashiCorp Terraform codify APIs into declarative configuration files that can be treated as code, edited, reviewed, shared and versioned.

What do all these advanced services have in common? The ability to facilitate infrastructure as code. By automating the process of building, managing and provisioning through code, service teams speed the process, eliminate human error and establish repeatability. This level of sophistication and efficiency is achievable when pairing the EDF with advanced services and automation.

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In this new model we add the idea of injectors. When you have a framework like the EDF with things moving full speed, the last thing you want is for people to have to stop the process in order to communicate with each other information specific to applications landing in the Landing Zone. For example, imagine having to interrupt automation to pass along a subnet ID.

To this end, most of the companies we work with have adopted automated tools that inject environment specific information into their service templates on the fly as elements go through the pipeline. This level of automation helps them reach their full potential and protects against fat-finger induced errors. We encourage the use among our customers of HashiCorp Vault and HashiCorp Consul for this purpose, allowing them to have their service and configuration information available for services to pull when needed.

EDF in Action

Take for example the case of Verifone who needed to ensure development was able to deliver high quality, secure solutions against tight deadlines. In its DevOps transformation, Verifone implemented the Flux7 EDF DevOps methodology with a laser-focus, giving the DevOps initiative defined size and scope. From a technology and process improvement perspective, AWS was combined with Docker to create from the ground up a new cloud-based, streamlined infrastructure designed to address high availability, portability across multiple environments, and a high degree of automation to increase agility and security.

As a cornerstone of successful DevOps, the team had a strong focus on continuous integration and continuous deployment, which it achieved with pipeline orchestration and simplified scaling and automation. In addition to industry standard best practices, PCI compliance policies were built in and technology was used to deploy security policies automatically.

While optimized systems and processes form a good foundation, DevOps doesn't

Landing Zone

A Landing Zone is often the first step in a cloud migration. It provides a platform on which to build proof of concepts and from which to evolve a cloud strategy at your pace. While many organizations trivialize initial setup of their AWS, this can have long term negative impacts on application security. Security must start at the foundation level to create the underpinnings for automated and embedded security across services.

Security By Design

As organizations modernize their computing systems through DevOps based cloud approaches, a new way to govern systems is needed. Traditional security methods do not scale to the new elastic platforms that use different design principles such as immutable containers, infrastructure as code, and continuous integration and delivery. This changes the landscape for security where the perimeter has a new definition and security policies are not applied but automated.

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While optimized systems and processes form a good foundation, DevOps doesn't happen without effective culture change. Knowing this, Verifone built a Center Of Excellence from a small team of dedicated DevOps engineers who oversaw the process. With the combination of CloudFormation templates that automate the process of deploying a correctly configured infrastructure layer, and Jenkins automation, Flux7 and SGI services team were able to automate the deployment, configuration and delivery of SGI microservices.

SGI was able to apply advanced automation from its EDF which allowed for truly transformative configuration, deployment and delivery processes. The SGI development team as a result of its new architecture is spending less time on tactical, manual tasks and more time on strategic solution delivery.

Seven Steps to EDF Success

To get started, follow this seven step roadmap:

1. Exploration - have a clear understanding of your starting point and where you want to go through defined business goals.
2. Choose a Pilot - this first step must be impactful in creating business value and small enough to allow for a quick win.
3. Design a Solution - process and technology must be defined up front for the pilot.
4. Build COE - a small team hand-picked to build the foundation for the DevOps transition and instill DevOps knowledge into the company.
5. Hold a CoE Summit - evangelize the importance of and make sure to pass along the important skills needed to support the new infrastructure, applications and culture.
6. COE Helps Dev and IT - this phase begins the effective transfer of knowledge from the COE to broader development and IT teams.
7. Modernization - adopt a virtuous cycle of constant learning to ensure ongoing success.

Microservices

Microservices makes some applications easier to build and maintain – which makes it easier to deliver technology quickly in competitive landscapes. By breaking applications down into smaller, composable pieces that work together, they can be developed concurrently. That means that individual development groups can choose their preferences, their timelines and process. Separation makes it possible to update individual components without having to worry about monolithic code changes.

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Conclusion

According to research by Gartner, roughly 80% of enterprises have yet to adopt DevOps. Yet, the business environment in which we operate is growing more competitive by the day, creating the need for digital transformation that more closely aligns IT with business goals. If you would like help in this endeavor -- pairing the Flux7 EDF as a model for marrying DevOps process improvement with digital transformation, bolstered with advanced cloud services for greater, truly transformative efficiencies -- reach out to us today.

LEARN MORE ABOUT FLUX7

As DevOps and AWS experts, Flux7 offers a suite of solutions that help organizations design, build, own and manage IT modernization projects. Focused on architecting and optimizing their clients' AWS infrastructure and training internal IT teams to manage their own infrastructure, Flux7 solutions are rooted in DevOps best practices. Flux7 has delivered hundreds of agile, right-sized projects to satisfied customers across industries, creating a well-architected core from which these business can own and expand their IT modernization.