

What's New in SAFe 4.5?

From ScaledAgileFramework.com

We are pleased to introduce the release of SAFe 4.5! It even has a new name: *SAFe for Lean Enterprises*, to better reflect the way in which SAFe helps improve alignment and execution across the entire enterprise. SAFe 4.5 is leaner, more agile, more configurable and fosters *faster innovation and learning*. It helps enterprises get *better, faster, business results* on a reliable basis.

With SAFe 4.5, you can configure SAFe to match your context. You can test ideas more quickly with the Lean Startup Cycle and Lean User Experience (Lean UX). You can deliver more quickly with Scalable DevOps and the Continuous Delivery Pipeline. You can govern better, and leaner, with Lean Portfolio Management. You can implement more efficiently and get better business results more quickly with the new Implementation Roadmap.

SAFe 4.5 maximizes the speed of product or service delivery from initial idea to release, and from customer feedback to enhancements, providing a 360-degree build-measure-learn feedback cycle.

The SAFe 4.5 release contains the following key areas of improvements:

1. Essential SAFe and Configurability
2. Innovation with Lean Startup and Lean UX
3. Scalable DevOps & Continuous Delivery
4. Implementation Roadmap
5. Other Important Stuff

SAFe's new *configurable framework* provides just enough guidance to meet the needs of your product or service. *Essential SAFe* helps companies get out of the gate quickly and start simply. As company needs grow, SAFe scales to meet those challenges.

The new Lean Startup, Lean UX, Lean Portfolio Management (LPM), and Lean Budgets content helps you innovate and implement strategy more quickly to realize better business outcomes. Scalable DevOps and Continuous Delivery helps accelerate the build-measure-learn cycle that supports faster innovation and more frequent releases.

But we all know that organizational change is hard. It requires adopting new behaviors, leadership styles, practices, and culture. SAFe accelerates Lean-Agile transformation with the new *Implementation Roadmap*, which guides enterprises every step of the way. The SAFe journey is supported by a worldwide network of Scaled Agile Partners and *SAFe Program Consultants (SPCs)*.

Backwards Compatible with SAFe 4.0

SAFe 4.5 is backwards compatible with SAFe 4.0, as shown in Figure 1 below. This means that organizations can adopt the new features in SAFe 4.5 at their own pace.

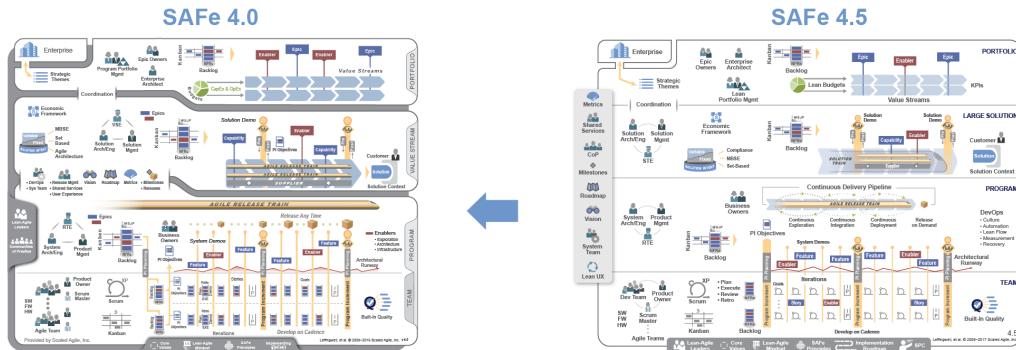


Figure 1. SAFe 4.5 is backwards compatible with SAFe 4.0

Essential SAFe and Configurability

There are now four configurations of SAFe that provide a more configurable, and more scalable, approach:

1. Essential SAFe
2. Portfolio SAFe
3. Large Solution SAFe
4. Full SAFe

Using the simple menu shown in Figure 2, you can choose the SAFe configuration that's right for your needs. Whenever you return to the home page, SAFe remembers your choice. Each configuration is described below.

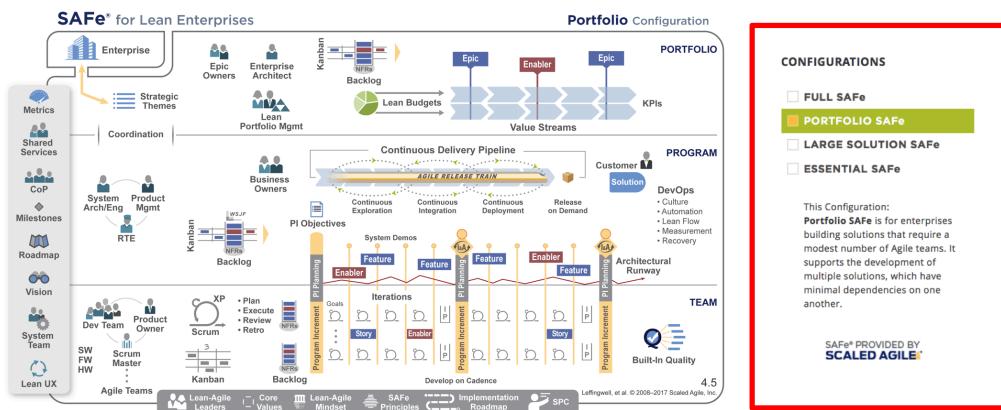


Figure 2. Configurable SAFe

Essential SAFe

Figure 3 illustrates *Essential SAFe*, which is the most basic configuration. It provides the starting point for implementing SAFe, and describes the most critical elements needed to realize the majority of the framework's benefits.

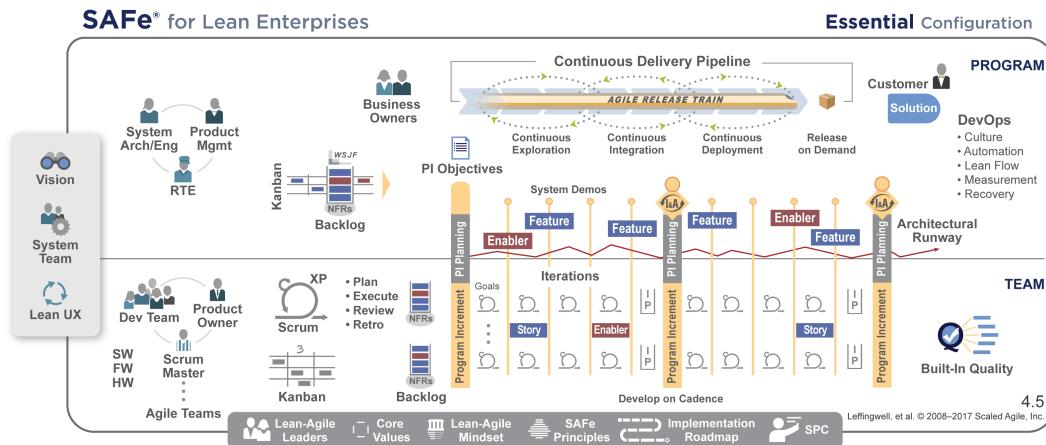


Figure 3. Essential SAFe configuration

Portfolio SAFe

The *Portfolio SAFe* configuration is for enterprises that build multiple, largely independent, solutions, and that also need to incorporate portfolio concerns such as strategy and investment funding, innovation across various value streams, and lean governance. It adds the Portfolio Level to Essential SAFe, as shown in Figure 4.

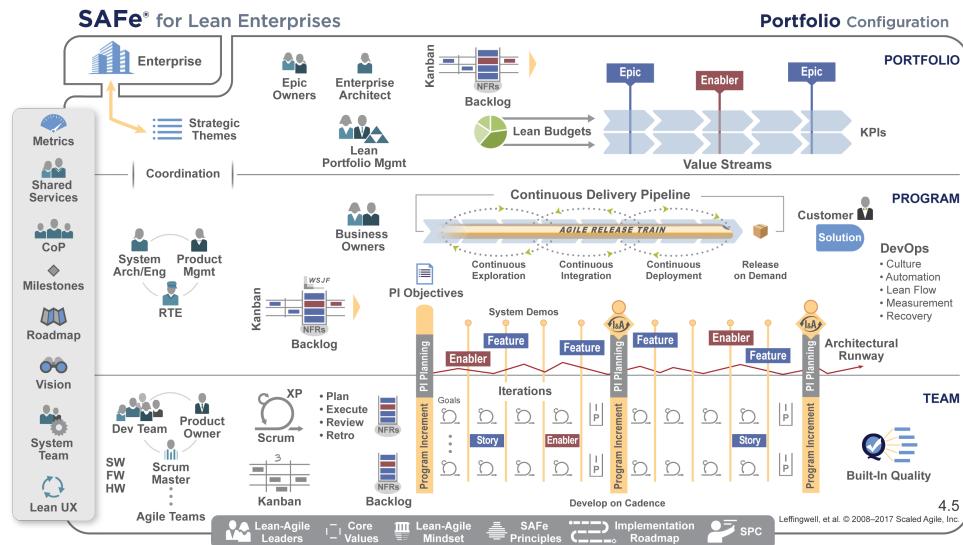


Figure 4. Portfolio SAFe Configuration

Large Solution SAFe

The *Large Solution SAFe* configuration is intended for enterprises that are building large and complex solutions that require the contribution of multiple Agile Release Trains and Suppliers, but do not require portfolio considerations. It consists of Essential SAFe and the Large Solution level, as illustrated in Figure 5.

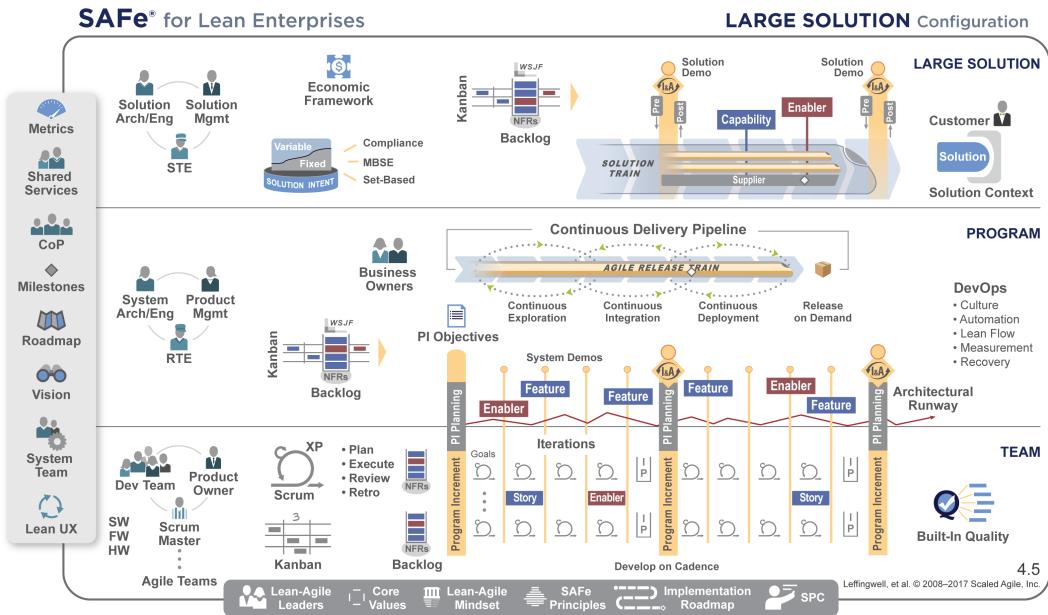


Figure 5. Large Solution SAFe Configuration

Along with other changes, note that the SAFe 4.0 Value Stream Level name has been changed to 'Solution Level'. This necessitated addition terminology changes as shown in Figure 6.

Previous Terminology	New Terminology
Solution Train	New term
Value Stream Backlog	Solution backlog
Value Stream Engineer	Solution Train Engineer
Value Stream Epics	Solution Epics
Value Stream Kanban	Solution Kanban
Value Stream Level	Large Solution Level
Value Stream PI Objectives	Solution PI Objectives

Figure 6. Value Stream terminology changes

Build Big Systems with the New Solution Train

The Solution Train (Figure 7) describes the SAFe organizational construct used to build large and complex solutions that need to coordinate multiple Agile Release Trains (ARTs), as well as the contributions of Suppliers. Using a common Solution vision, backlog and roadmap—and an aligned Program Increment (PI) cadence—the Solution Train aligns ARTs and Suppliers to a shared business and technology mission.

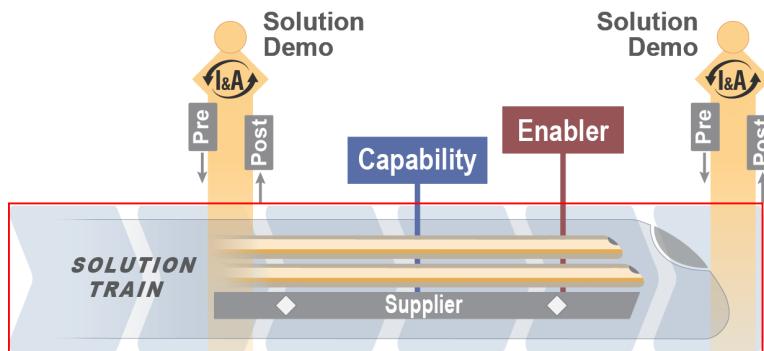


Figure 7. New Solution Train

Solution Train Engineer (STE)

The Solution Train Engineer (STE), previously known as the Value Stream Engineer, is the train's servant leader. The STE helps the Solution Train run smoothly by identifying and resolving bottlenecks across the entire solution.

Bringing Compliance into SAFe

Compliance (Figure 8) is now part of *Solution Intent* and describes how to achieve high quality results while meeting regulatory and industry requirements using Lean-Agile development.

Compliance *enablers* are used to schedule and manage specific compliance activities, including Verification and Validation (V&V), documentation and signoffs, and regulatory submissions and approvals.

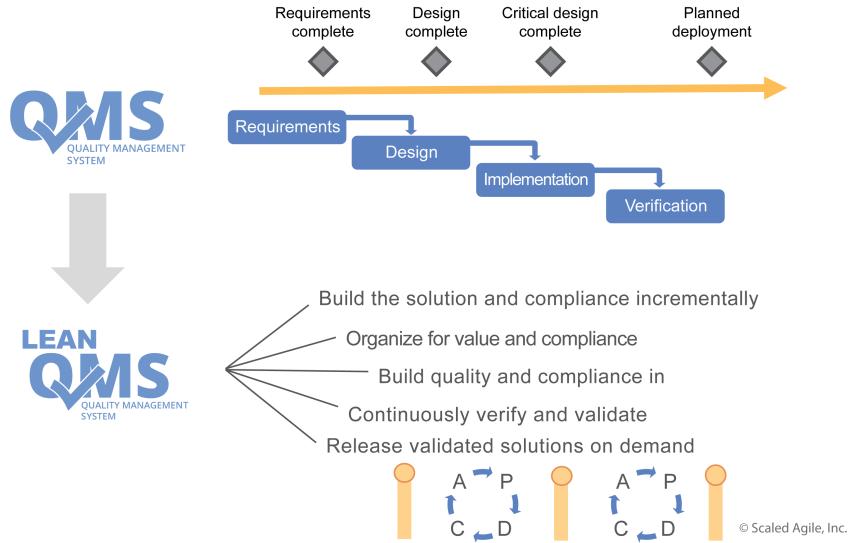


Figure 8. Introducing compliance into SAFe 4.5

Agile Architecture

Agile Architecture is still an element of Solution Intent. However, it has been moved off the big picture and into the guidance page. Agile Architecture is also covered briefly in Built-in Quality.

Full SAFe

Full SAFe (Figure 9) is the most comprehensive configuration. It supports those enterprises building large, integrated solutions that typically require hundreds of people or more to develop and maintain.

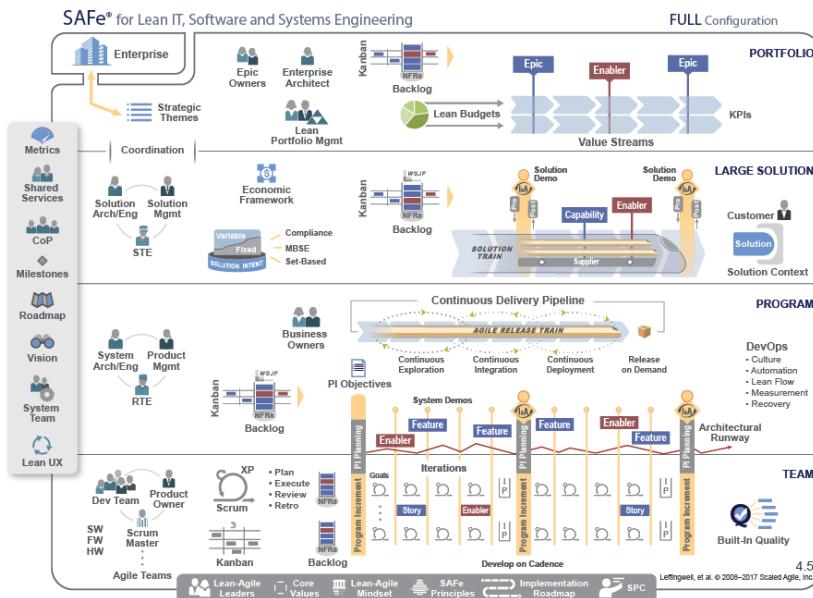


Figure 9. Full SAFe

Refine Configuration with the Spanning Palette

The spanning palette was changed from landscape to *portrait* orientation, so that it truly spans all levels of the framework—team, program, large solution, and portfolio.

A key element of SAFe's flexibility and configurability, the spanning palette permits organizations to apply only the elements needed for each level. The spanning palette dynamically changes depending upon the configuration chosen, as shown in Figure 10. Other changes include:

- Abbreviated Communities of Practice to 'CoP' due to the new spanning palette design
- Moved from UX to Lean UX and expanded on user experience development
- Removed the Release Management icon and incorporated the content into Release on Demand



Figure 10. New Spanning Palette

Innovation with Lean Startup and Lean UX

The Lean Startup movement embraces the highly iterative "Hypothesize-Build-Measure-Learn" cycle, which fits quite naturally into SAFe. Specifically, we can apply this model to any Epic-level initiative, whether it arises at the Portfolio, Large Solution or Program Level. No matter the source, the scope of an epic calls for a prudent and iterative approach to investment and implementation via a Minimum Viable Product (MVP), as reflected in Figure 11. Learn more about the Lean Startup cycle in the Epic article.'

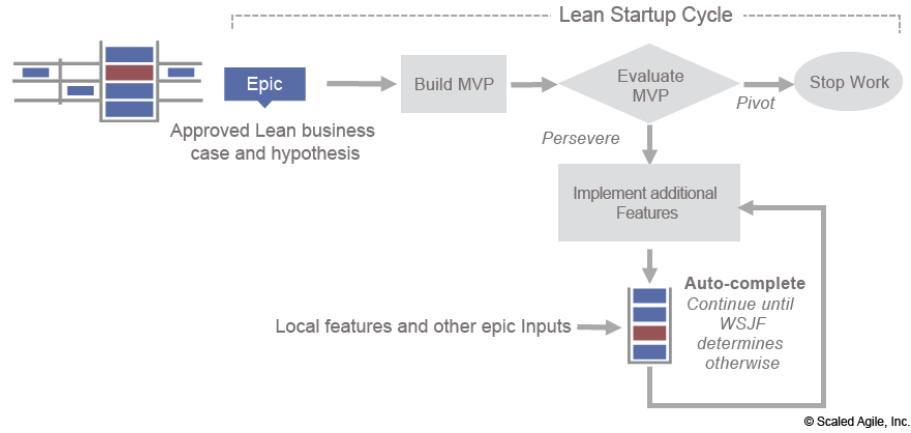


Figure 11. Lean Startup Cycle

To foster the new Lean Startup thinking in SAFe, the Epic Value Statement and Lightweight Business Case have been refactored to become the *Epic Hypothesis Statement* (Figure 12) and *Lean Business Case* (Figure 13) respectively. More than just name changes, they represent a whole new way of thinking and working. Learn more about the Epic Hypothesis Statement and Lean Business Case in the epic article.

Epic Hypothesis Statement	
For	<customers>
who	<do something>
the	<solution>
is a	<something – the "how">
that	<provides this value>
Unlike	<competitor, current solution, or non-existing solution>
our solution	<does something better – the "why">
Outcomes hypothesis:	
•	
•	
Leading indicators:	• (early innovation accounting measures)
•	
NFRs:	•
•	

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Figure 12. Epic Hypothesis Statement

SCALED AGILE®		
Lean Business Case		
<p>Impact on Products, Programs and Services: (Identify products, programs, services, teams, departments)</p>		
<p>Impact on Sales, Distribution, Deployment: (Describe any impact on how the product is sold, distributed)</p>		
<p>Analysis Summary: (Brief summary of the analysis that has been formed to date for this business case.)</p>		
Estimated Story Points (MVP): <small>(Estimated story points for the MVP of the epic)</small>	Estimate: <small>(Example: MVP fee)</small>	
Type of Return: <small>(Market share, increased revenue, improved productivity, new markets served, etc.)</small>	Anticipate: <small>(Revenue)</small>	
<p>In-house or Outsourced Development: <small>(Provide recommendations for where the Epic should be developed)</small></p>		
Estimated Development Timeline	Start Date: <small>(Estimated start date)</small>	
<p>Incremental Implementation Strategy: <small>(Epics are defined as a single whole, but each epic undergoes iteration on potential strategies. Many parts of this guidance apply to epics.)</small></p>		
<p>Sequencing and Dependencies: <small>(Describe any constraints for sequencing the epic and dependencies)</small></p>		
<p>Milestones or Checkpoints: <small>(Identify potential milestones or checkpoints for review and validation)</small></p>		
<p>Attachments:</p>		
<p>SCALED AGILE®</p>		
<p>Lean Business Case</p>		
Epic Name: <small>(Short name for the Epic)</small>	Funnel Entry Date: <small>(Date the Epic entered the funnel)</small>	Epic Owner: <small>(The name of the Epic Owner)</small>
<p>Epic Description: <small>(Consider using the Epic Hypothesis Statement in the Epic article as a starting point for a description of the epic.)</small></p>		
<p>Outcomes hypothesis: <small>(Describe how the success of the Epic will be measured, for example, 50% increase in shoppers under 25; Availability increases from 93% to 99.9%, etc. Be certain to establish innovation accounting metrics to provide leading indicators.)</small></p>		
<p>In Scope:</p> <ul style="list-style-type: none"> • -- • -- • -- 	<p>Out of Scope:</p> <ul style="list-style-type: none"> • -- • -- • -- 	<p>Nonfunctional Requirements:</p> <ul style="list-style-type: none"> • -- • -- • --
<p>Minimum Viable Product (MVP) Features</p> <ul style="list-style-type: none"> • (Feature or Capability) • -- • -- 		<p>Additional Potential Features</p> <ul style="list-style-type: none"> • (Feature or Capability) • -- • --
<p>Sponsors: <small>(List key business sponsors who will be supporting the initiative)</small></p>		
<p>Users and Markets Affected: <small>(Describe the user community of the solution and any markets affected)</small></p>		

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Figure 13. Lean Business Case/[caption]

The Lean UX approach (Figure 14) starts with an outcome hypothesis: Agile teams and UX designers accept that the ‘right answer’ is actually unknowable up-front. Rather, they apply Agile methods to avoid Big Design Upfront (BDUF), focusing instead on creating a hypothesis about what business outcomes to expect from a new feature, and then implements and tests that hypothesis incrementally. This results in faster feedback, which steers the solution toward success more effectively.

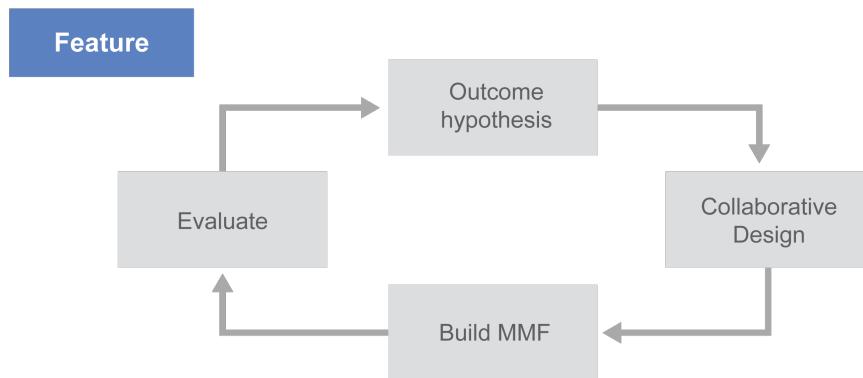


Figure 14. Lean UX

As a result of the hypothesis-driven approach of Lean UX, the Features and Benefits (FAB) matrix has been updated to describe features and capabilities with a *Benefit Hypothesis*, as illustrated in Figure 15.

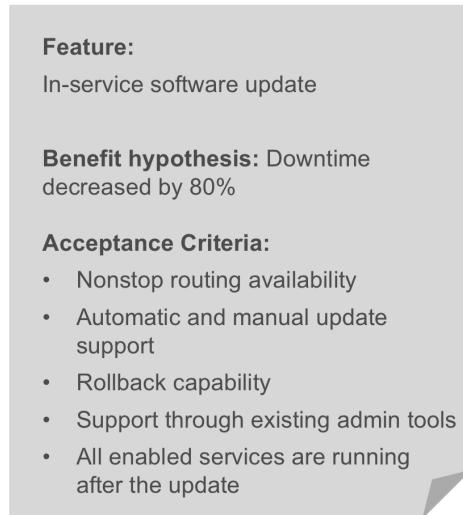


Figure 15. Features have a benefit hypothesis[/caption]

Lead and Govern with Lean Portfolio Management

Formerly Program Portfolio Management (PPM), each SAFe portfolio has an LPM function that is responsible for strategy and investment funding, Agile program guidance, and Lean governance, as illustrated in Figure 16.

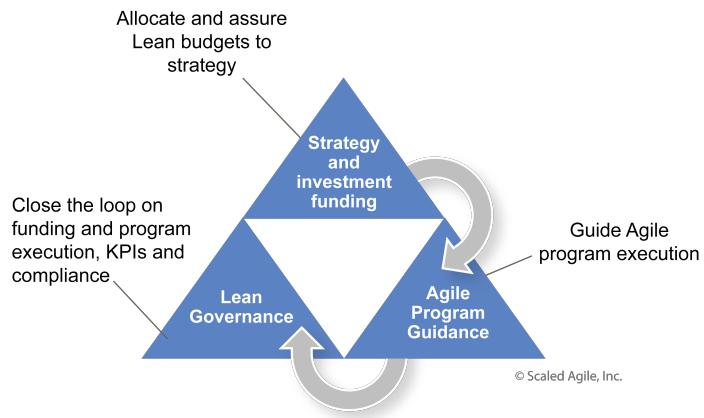


Figure 16. Lead and govern with Lean Portfolio Management

Scalable DevOps and the Continuous Delivery Pipeline

DevOps is a mindset, a culture, and a set of technical practices. It provides communication, integration, automation, and close cooperation among everyone needed to plan, develop, test, deploy, release, and maintain a Solution.

SAFe enterprises implement DevOps to break down silos and empower each Agile Team, ART and Solution Train to continuously deliver new features to end users. This is indeed achievable, as “high-performing IT organizations deploy 30x more frequently with 200x shorter lead times ... 60x fewer failures and recover 168x faster.” [1]

DevOps consists of the following elements, shown in Figure 17 and described briefly below:

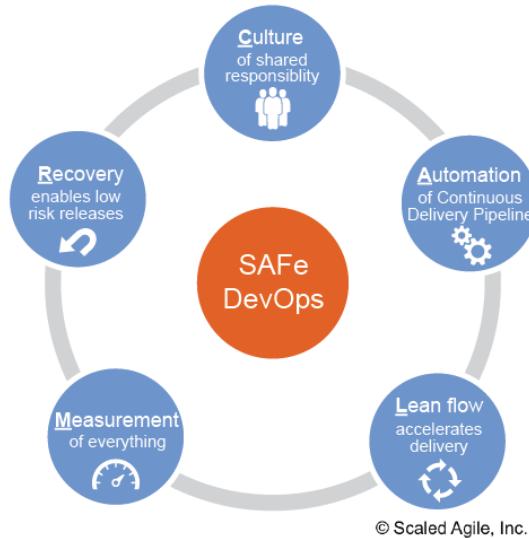


Figure 17. Realize flow with a CALMR approach to DevOps

- **Culture** - Establish a culture of shared responsibility for development, deployment and operations.
- **Automation** - Automate the continuous delivery pipeline.
- **Lean flow** - Keep batch sizes small, limit Work in Process (WIP), and provide extreme visibility.
- **Measurement** - Measure the flow through the pipeline. Implement application telemetry.
- **Recovery** - Architect and enable low-risk releases. Establish fast-recovery, fast-reversion, and fast fix-forward.

Continuous Delivery Pipeline

The Continuous Delivery Pipeline doesn't operate in a strict linear sequence. Rather, it's a learning cycle that allows teams to establish a number of *hypotheses*, *build* and deliver against them, *measure* results and *learn* from that work, as Figure 18 illustrates.

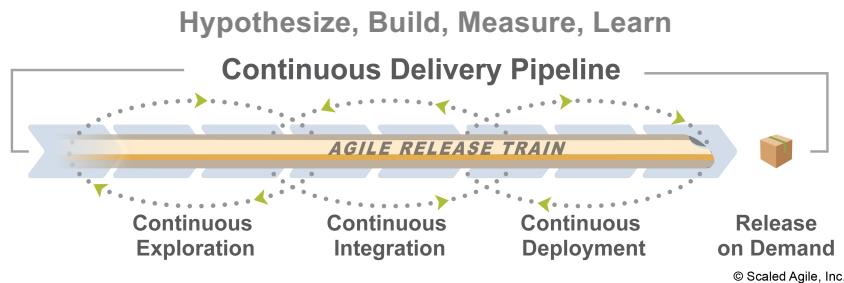


Figure 18. Continuous Delivery Pipeline

- Continuous Exploration - is the process of constantly exploring market and user needs, and defining a vision, roadmap, and set of features that address them.
- Continuous Integration - is the process of taking features from the Program Backlog and developing, testing, integrating, and validating them in a staging environment that prepares them for deployment and release.
- Continuous Deployment - is the process that takes validated features from continuous integration and deploys them into the production environment, where they are tested and readied for release.
- Release on Demand - is the process by which deployed features are released to customers incrementally or immediately based on market demand. The Program Kanban is used by the ART to facilitate the flow of features through the Continuous Delivery Pipeline. A typical program Kanban is illustrated in Figure 19. The policies applied to each state, and some example WIP limits, are highlighted. The example program kanban states were updated to support DevOps, Continuous Delivery Pipeline and releasing.

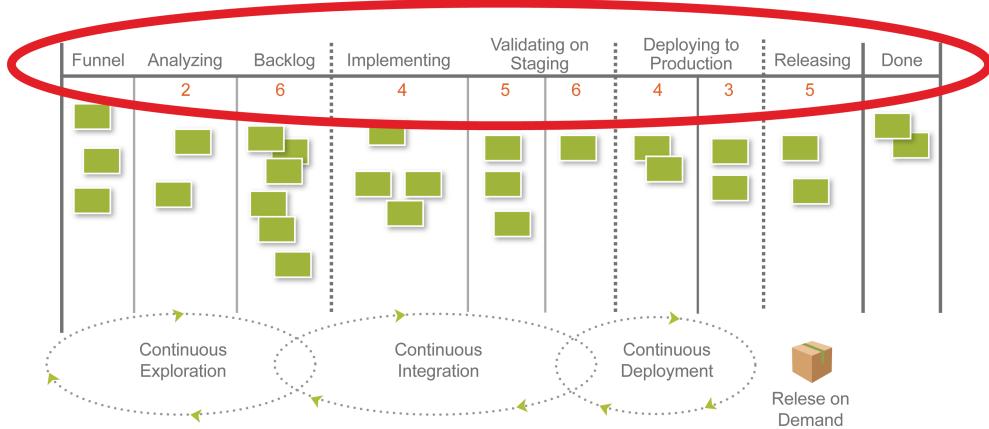


Figure 19. Visualize and manage full value flow

Implementation Roadmap

The SAFe Implementation Roadmap (Figure 20.) consists of a *clickable, interactive* graphic linked to a 12-article series that describes the major activities that have proven to be effective in successfully implementing SAFe.

This roadmap is accessible from both the foundation on the big picture and the implementing menu on the SAFe website. You can download a .pdf or .ppt version of the roadmap from this article.

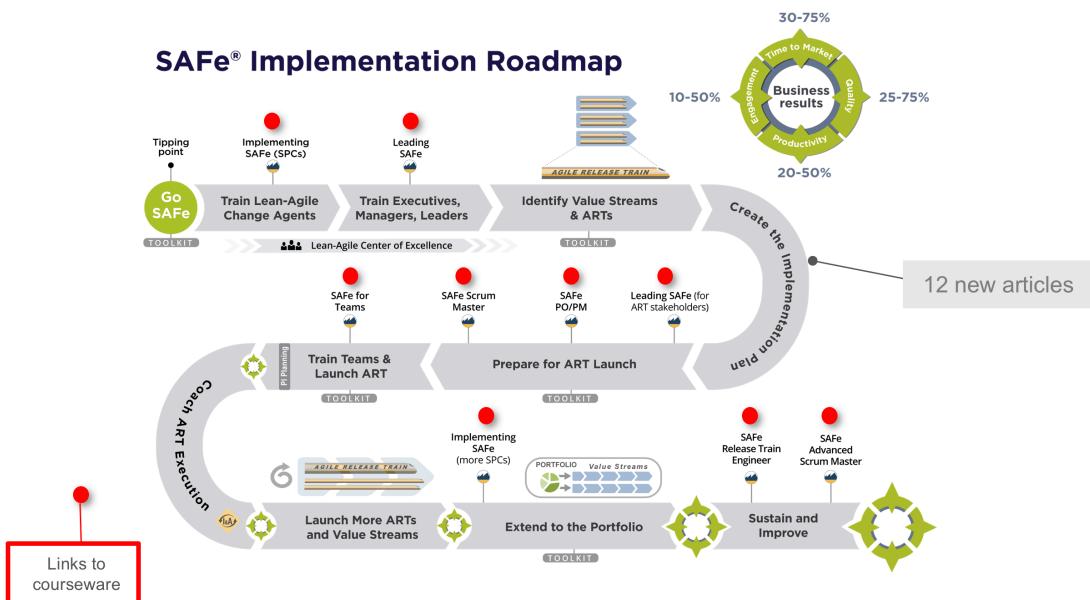
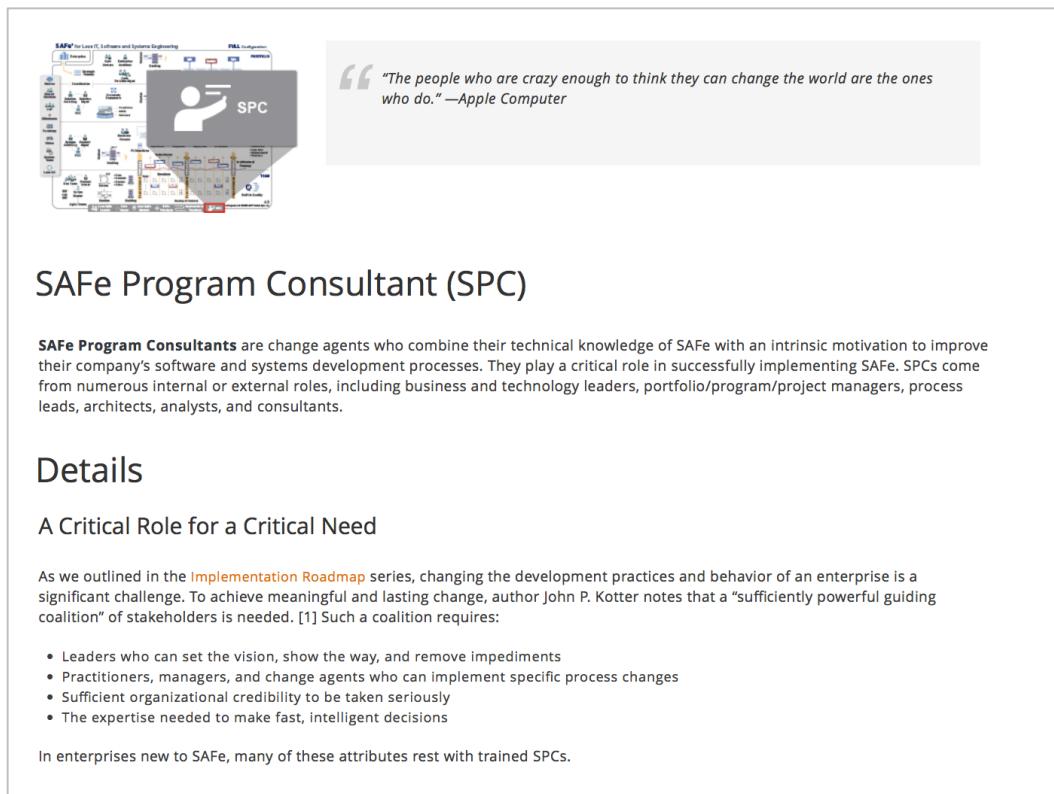


Figure 20. Implementation Roadmap

The critical role of the SAFe Program Consultant

SAFe Program Consultants (SPC) are change agents who combine their technical knowledge of SAFe with an intrinsic motivation to improve their company's software and systems development processes. They play a critical role in successfully *implementing SAFe*. SPC's are now represented in SAFe as part of the SAFe Foundation and is described in the new SPC article, as illustrated in Figure 21.



The image shows a screenshot of a web page titled "SAFe Program Consultant (SPC)". At the top left is a diagram of the SAFe architecture, showing various layers like Lean IT, Software and Systems Engineering, and PMI Integration. A large central box is labeled "SPC". To the right of the diagram is a quote in a callout box: "The people who are crazy enough to think they can change the world are the ones who do." —Apple Computer. Below the quote, the section title "SAFe Program Consultant (SPC)" is displayed. A detailed description follows: "SAFe Program Consultants are change agents who combine their technical knowledge of SAFe with an intrinsic motivation to improve their company's software and systems development processes. They play a critical role in successfully implementing SAFe. SPCs come from numerous internal or external roles, including business and technology leaders, portfolio/program/project managers, process leads, architects, analysts, and consultants." Under the heading "Details", there is a section titled "A Critical Role for a Critical Need" which discusses the challenges of changing enterprise development practices and the need for a guiding coalition of stakeholders. It lists four requirements for such a coalition: Leaders who can set the vision, show the way, and remove impediments; Practitioners, managers, and change agents who can implement specific process changes; Sufficient organizational credibility to be taken seriously; and The expertise needed to make fast, intelligent decisions. A note at the bottom states: "In enterprises new to SAFe, many of these attributes rest with trained SPCs."

Figure 21. SAFe Program Consultant article excerpt

Other Important Stuff

Improved Big Picture Look and Feel

We've improved the readability of the big picture by making hundreds of small changes. These include more white space, standardized font sizes and colors, and reduced visual clutter by moving less popular icons to guidance. For example:

- **CapEx & OpEx** – The icon was taken off the big picture and the article content was moved to the guidance page.
- **Release Management** – The icon was removed and the article content was incorporated into the Release on Demand.

- **Enablers** - The types of enablers icon were removed, but they are still described in the Enablers. Removing this icon also increases the flexibility of SAFe to add new enablers (e.g. Compliance) without having an impact on the big picture.
- **Value Stream and Program Epics** - The icons were removed but the descriptions remain in the Epics.

Refactored Article Architecture

The format of articles was changed to improve consistency. Each article is consistently structured as follows:

- **Article title** – Shows the title of the article minus the word ‘abstract’ to reduce visual clutter
- **Glossary definition and overview** – Each article now includes the glossary definition first, followed by a brief introduction
- **Details** – Contains sub sections to describe the topic
- **Learn More** – Lists resources to learn more about the topic

Increased Alignment with the Scrum Guide

The following changes were made to improve alignment between SAFe and Scrum:

- Iteration Review (Sprint Review) was added to the big picture and now includes the *Team Demo* as part of that event. This will help reduce confusion between the Team Demo and System Demo events.
- Dev Team, which consists of three to nine people, was added to the big picture. An Agile/Scrum Team in SAFe now consists of three roles: The Dev Team, Product Owner, and Scrum Master. Many Kanban teams may not use the Scrum Master or Product Owner roles, however, most find them useful.
- The Scrum events (see Figure 22) were moved next to the ScrumXP icon . The font size is also easier to read and click.

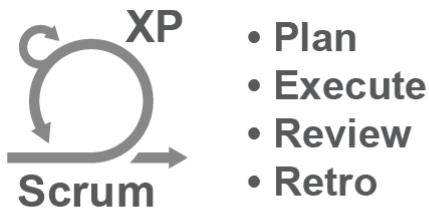


Figure 22. Scrum Events

Simpler Glossary and Translations

The glossary has been translated into *nine languages* and has a new dropdown widget (see Figure 23) to support downloading both US letter and A4 .pdf formats. The glossary entry is now the first element of each SAFe article.

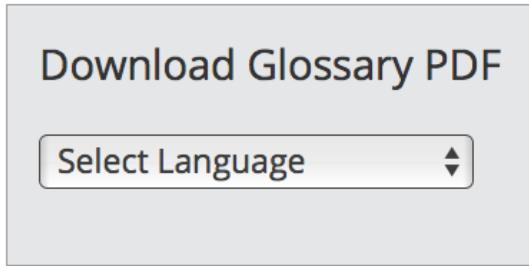


Figure 23. Glossary with dropdown for language selection

Combined SAFe Foundation Elements

As illustrated in Figure 24, SAFe's foundation contains the supporting principles, values, mindset, implementation guidance, and leadership roles needed to successfully deliver value at scale.

The foundation appeared in two places on the big picture—the left side and bottom. It has now been consolidated to one level at the bottom of the framework. Additional changes include:

- **Communities of Practice (CoP)** was relocated from the left-side foundation to the *spanning palette*.
- **Lean Agile Leaders** was moved from the left-side foundation to the bottom.
- **SAFe Program Consultant (SPC)** was added to the foundation. SPCs are a key part of the leadership that is needed to implement SAFe.
- **Implementation Roadmap** replaced Implementing 1-2-3.



Figure 24. SAFe 4.5 Foundation

[1] <https://puppet.com/resources/whitepaper/2015-state-devops-report>

[2] Ries, Eric. *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. Random House, Inc.