How Can DevOps Practices Help You Increase Innovation Velocity and Business Agility on the Mainframe?

CA solutions deliver DevOps for the mainframe and support agile development, continuous testing, continuous delivery and agile operations, giving you a common set of tools to work from across the enterprise, as well as the potential to accelerate time to market and reduce mean time to resolution (MTTR)—both of which can lead to innovation velocity and business agility.

Executive Summary

Challenge

In the midst of digital transformations, customers have adopted or are in the process of adopting agile methodologies and DevOps practices and toolsets throughout mobile, cloud and distributed platforms. To fully realize the benefits of speed to market, increased effectiveness and operational efficiency, enterprises are moving to expand these practices to their mainframe organizations.

Opportunity

By taking a cross-enterprise approach, we help customers streamline tooling and improve collaboration across the enterprise mobile to mainframe. CA solutions support **DevOps on the mainframe**—addressing long lead times to accelerate time to market, and high MTTR to improve reliability—and **DevOps with the mainframe** to unify mobile to mainframe to deliver business value across the enterprise, gain visibility and promote cultural transformation.

Benefits

Why change? Faster time to market adds up to innovation velocity. A recent global survey[1] on digital transformation found that:

• Advanced DevOps users reduced the time it took develop, test and release new applications by 42%.

• Advanced agile users reduced their time to decide and act on new opportunities by 40%.

• Advanced agile users accelerated the time to develop, test and release new apps by 36%.

SECTION 1

# Challenges to Delivering DevOps Practices for Mainframe

In the midst of digital transformations, customers have adopted or are in the process of adopting agile methodologies and DevOps practices and toolsets throughout mobile, cloud and distributed platforms. To fully realize the benefits of speed to market, increased effectiveness and operational efficiency, enterprises are moving to expand these practices to their mainframe organizations. The end result, the connected mainframe, delivers significant business value. In fact, according to an IDC study, organizations who realize a "connected mainframe" stand to achieve more than 300 percent ROI over five years, and generate almost $200 million in additional revenue per year by improving business and IT staff productivity and cutting operational costs.[2]

Barriers to success

Realizing a connected mainframe strategy can seem like an uphill battle, particularly as 78 percent of organizations today are still experiencing the cost pressure from sustained MIPS growth.[3] Foremost, a shortage of mainframe talent continues to deplete cost-strained IT staff, inhibiting efforts to sustain innovative change on the mainframe. With a significant portion of seasoned mainframers set to retire yearly, success requires a new generation to become comfortable working with mainframe data and applications. Upkeep remains a challenge as well, and ranges from maintaining mainframe logical partitions (LPARs) to the management of test data and configurations. Altogether, progressive processes and toolsets supporting agility and modernization are needed to address barriers to success.

FIGURE 1.

Key challenges to delivering continuously on mainframe platforms.
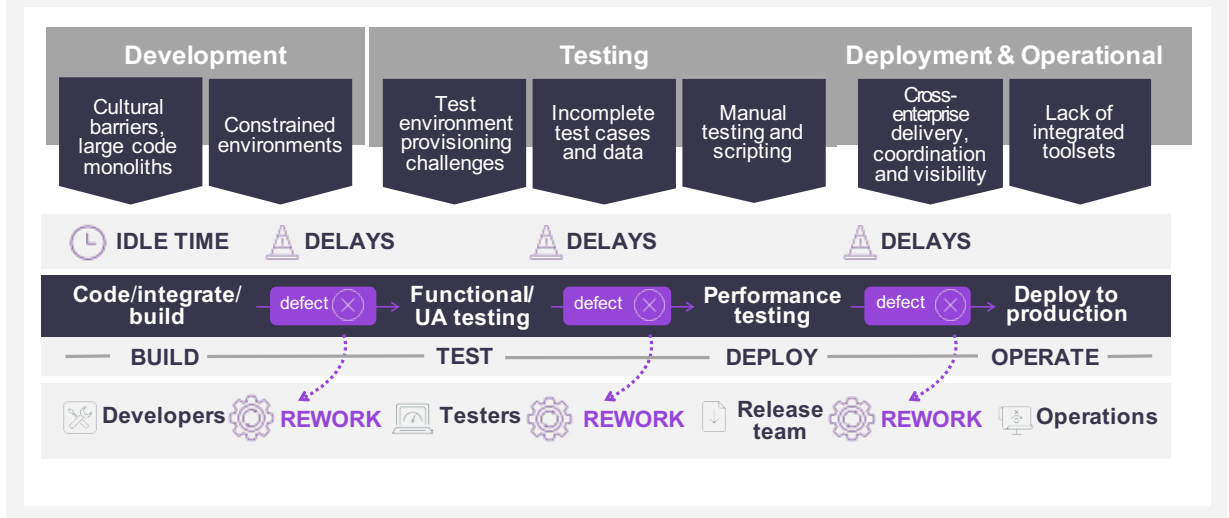
Development challenges

- **Cultural barriers and large code monoliths.** As organizations look to bring innovation velocity across the enterprise, including the mainframe, challenges arise around developer productivity, adopting agile processes to foster a culture of collaboration, or delivering small or contained changes faster into production against large code bases that may not have been sufficiently componentized or refactored.

- **Constrained environments.** Development teams seeking to adopt agile and DevOps practices on the mainframe often have to confront a lack of ready access to environments that enable them to isolate changes as they develop and debug or test early and often against systems that closely mirror their production environments, which can lead to long wait times before critical quality inspections occur

Testing challenges

- **Test environment provisioning.** Setting up and provisioning test environments can be a barrier to rapid application delivery, particularly with the need to manually set up multiple test environments on multiple LPARs.

- **Incomplete test cases and data.** There may be thousands of test cases, many of which are dated and poorly documented. Test data may be missing, out of date or require proper security management of replicated production data. In addition, setting up test cases and test data may be entirely manual, and managing what data is needed for what tests, as well as knowing the test coverage the data provides, are resource-intensive processes.

- **Manual testing and scripting.** In many cases, testing and scripting is conducted manually, while distributed counterparts are using automated testing and test libraries to reduce the time to test.

Deployment and operational challenges

- **Cross-enterprise delivery, coordination and visibility.** IT managers and development managers may still find a "black box" when it comes to understanding what is happening with the mainframe team, which introduces governance risks in terms of delivering on time and on budget.

- **Lack of integrated toolsets.** For the most part, mainframe teams deploy and deliver code to production using separate processes, and monitor applications separately. These elements are changing, though, as customers adopt cross-enterprise tooling.

Did you know that CA has transformed its own mainframe team to agile development leveraging CA processes and tools?[4]
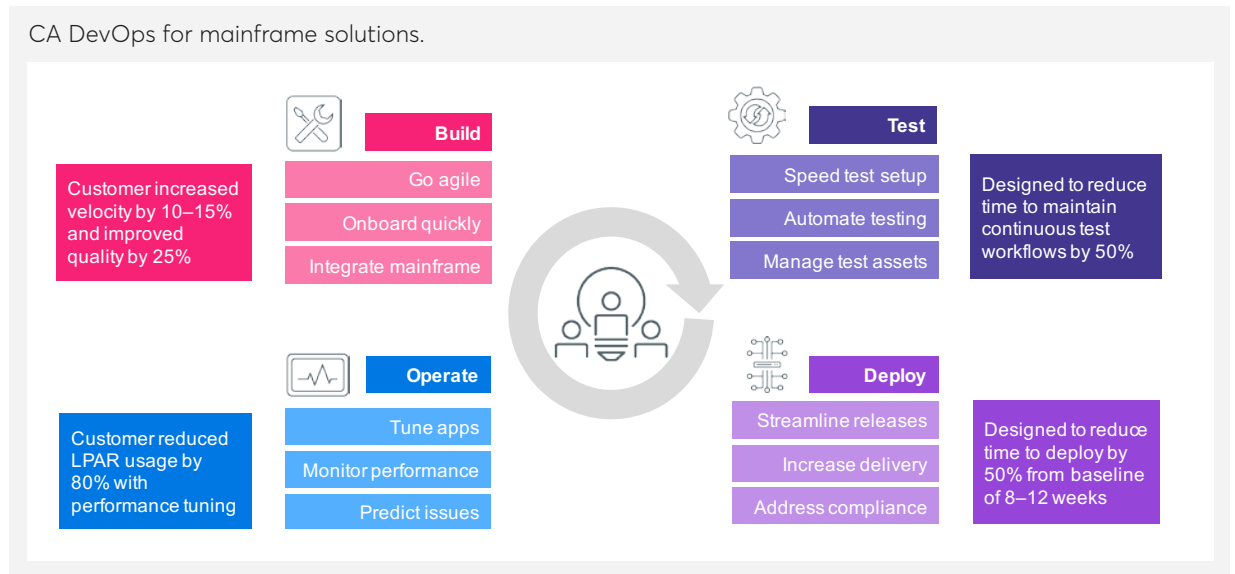
- Over 100 million lines of code are managed by CA Endevor® Software Change Manager (SCM).

- We have fully adopted Scaled Agile Framework® (SAFe®) agile development practices throughout our engineering team.

- Customers participate—80% of releases have more than 5 customers engaged.

- Quality is built in—56 products released with zero net-new defects.

- Delivering better quality, faster—reduced engineering backlog 46%, customer support call backlog has fallen 44%, incoming call volume has decreased 33%.

SECTION 2:

DevOps for Mainframe: How CA Helps

CA takes a cross-enterprise approach to helping customers streamline tooling and improve collaboration across the enterprise mobile to mainframe. CA DevOps solutions support DevOps on the mainframe—addressing long lead times to accelerate time to market, and high MTTR to improve reliability—and DevOps with the mainframe to unify mobile to mainframe to deliver business value across the enterprise, gain visibility and promote cultural transformation. Our solution covers four key areas (see Figure 2).

FIGURE 2.

CA DevOps for mainframe solutions.

Build
- Go agile
- Onboard quickly
- Integrate mainframe

Customer increased velocity by 10–15% and improved quality by 25%

Test
- Speed test setup
- Automate testing
- Manage test assets

Designed to reduce time to maintain continuous test workflows by 50%

Operate
- Tune apps
- Monitor performance
- Predict issues

Customer reduced LPAR usage by 80% with performance tuning

Deploy
- Streamline releases
- Increase delivery
- Address compliance

Designed to reduce time to deploy by 50% from baseline of 8–12 weeks

Build swiftly

CA enables enterprise application teams to easily manage, develop and maintain cross-enterprise applications supported by diverse teams and different tools, and on multiple platforms. CA solutions help organizations develop and maintain mainframe applications with agile and modern methodologies, toolsets and coding languages.

1. **Go agile** with agile processes and tools that speed time to market for mainframe teams:
   a. Leverage SAFe methodology and process training.
   b. Enable agile planning for mainframe teams with **CA Agile Central** and **CA Application Lifecycle Conductor**.
   c. Support agile and continuous delivery with **CA Endevor SCM**.

2. **Onboard your team quickly** with modern toolsets and languages on the mainframe:
   a. Enable modern mainframe IDE for all developers with Eclipse-based UIs into testing tools and software change management—**CA Development Environment for z Systems**.
   b. Take advantage of visual debugging to quickly understand the context of your mainframe applications in the greater scheme.
   c. Provide support for Git and Java™ for the best of mainframe development and SCM without the mainframe tooling interface—**CA Endevor SCM**.

3. **Integrate mainframe** into the enterprise development with traceability and governance of SDLC, mobile to mainframe, using **CA Application Lifecycle Conductor**:

    a. Enable lifecycle tracking of software artifacts.

    b. Provide integrations to common third-party tools for one view.

    c. Provide managerial dashboards for one view of development, mobile to mainframe.

> "I think the Endevor agile methodology is awesome. It's so nice to be able to provide input while the features are being designed. This way we know what the feature will look like before it's delivered."[5]
>
> —DevOps engineer, Global 500 health care company

Test early and often

For test engineers, systems programmers and test managers, CA supports tooling that reduces test cycle time for faster time to market, while reducing costs of mainframe testing to improve mainframe economics. Our solutions give teams the ability to quickly set up testing environments for mainframe applications with critical dependent components and test data.

1. **Speed test setup** with comprehensive test data management and service virtualization

    a. Automate your ability to find, profile and provision test data, with data masking and synthetic data generation to meet compliance guidelines—**CA Test Data Manager**.

    b. Simplify test file editing and data creation with **CA File Master Plus**.

    c. Provision multiple emulated environments for parallel development and testing with **CA Service Virtualization**.

2. **Automate testing** with frameworks to automate unit tests and automate testing into the delivery pipeline:

    a. Leverage a unit test automation framework with **CA Development Environment for z Systems**.

    b. Integrate and automate test scripts into the delivery pipeline, and gain the ability to trace test asset completion to monitor for issues using **CA Application Lifecycle Conductor** in conjunction with your preferred application release automation solution.

3. **Manage test assets** by leveraging the DevOps catalog that stores and provisions test assets and requirements:

    a. Leverage catalog test assets for reuse (test scripts, batch jobs, configurations, data, virtual/real services) with the **DevOps Catalog**.

    b. Map requirements and user stories to testing assets; search and manipulate with **CA Application Lifecycle Conductor**.

Deploy reliably

CA enables organizations to reduce time to market with a continuous delivery pipeline that increases velocity and facilitates continuous improvement. For release managers, CA Endevor admins and IT operations managers, our solutions provide the ability to automate and orchestrate a continuous delivery process, subjecting the application to key quality measures like integration testing, user acceptance testing (UAT), system and performance testing and preproduction validations—all to deploy changes quickly with high quality.

1. **Streamline releases** with your choice of application release automation solutions from CA:

   a. Enable zero-touch sequential/parallel deployments for IBM z/OS® apps supporting rollback.

   b. Enable automation and orchestration across multiplatform z/OS applications.

   c. Imrpove team process with continuous delivery best practices.

2. **Increase delivery** with feedback-driven metrics that facilitate continuous feedback loops via **CA Application Lifecycle Conductor**:

   a. Notification of outages/issues across toolsets

   b. Continuous feedback loops inform deployment reliability and velocity

   c. Interactive and customizable dashboards

3. **Address compliance with CA Endevor SCM**, the leading source code management tool that addresses escalating regulatory risks:

   a. Trace all changes for quick governance and accountability.

   b. Provide automated change tracking with strict authorization qualifications.

   c. Leverage an Eclipse-based UI to improve administrative productivity.

"We have multiple teams within our organization. CA Technologies has allowed us to run parallel development within our products and to effectively coordinate delivery and to manage multiple versions of our software."[6]

—Martin Eison, senior IT architect, Computer Sciences Corporation

Operate efficiently

CA enables organizations to unify monitoring and performance management across mobile and mainframe teams for better MTTR and lower skills costs. For performance engineers, system administrators, IT operations managers and leaders, CA provides the ability to easily monitor and resolve performance issues cross-enterprise, with embedded intelligence to predict anomalies early on for speedier and less-costly resolution.

1. **Tune apps with CA Mainframe Application Tuner** to optimize MIPS consumption and code performance:
   a. Pinpoint code inefficiencies across applications.
   b. Leverage an easy-to-use, efficient, Eclipse-based UI.
   c. Automate measurement captures to diagnose issues.

2. **Monitor performance** across teams using one single interface, mobile to mainframe:
   a. Take advantage of end-to-end application and infrastructure visibility and cross enterprise, real-time monitoring on a single pane of glass with **CA Unified Infrastructure Management** and **CA Cross-Enterprise APM**.
   b. Drill down into code issues for further performance tuning with CA Mainframe Application Tuner.

3. **Predict issues** with machine learning that encodes tribal knowledge and improves on MTTR:
   a. Use a streamlined, web-based tool for team collaboration.
   b. Leverage built-in, predictive analytics, automated remediation and continuous feedback loops so the system gets smarter over time—**CA Mainframe Operations Intelligence**.
   c. Gather intelligence on trends in production failures to inform future development—**CA Mainframe Application Tuner** and **CA Application Lifecycle Conductor**.

"CA definitely beats other vendors in terms of cost-benefit. The tools are easy to use and support is right on point."[7]

—Angelica Casali, IT Specialist, Morgan Stanley

SECTION 3:

Achieve Innovation Velocity on the Mainframe

Why change? Faster time to market and improved MTTR add up to innovation velocity.

According to a recent global survey[8] on digital transformation:

- In a survey of over 1,400 IT and business professionals, around half indicated that "keeping pace with escalating customer demands" and "rapid response to requests from the business" remain critical drivers of IT investment. Not surprisingly, improving MTTR with agile operations can yield big benefits. One CA customer leveraged cross-enterprise performance monitoring to save $457,380 over three years through proactive incident detection and rapid triaging.

"When selecting a vendor, check the quality of the tools, the stability, and most importantly, the customer response to issues. Our short list was CA and IBM … CA won hands down."[9]

—George Rieker, Endevor Administrator, SunTrust Investment Services, Inc.

SECTION 4:

Next Steps

If your organization is challenged to become more efficient and deliver mainframe applications and code changes to market faster with fewer resources, the time is now to consider solutions from CA that enable DevOps for Mainframe.

To learn more about DevOps for mainframe solutions from CA, visit **ca.com/upyourappgame/mainframe**

Connect with CA Technologies

CA Technologies (NASDAQ: CA) creates software that fuels transformation for companies and enables them to seize the opportunities of the application economy. Software is at the heart of every business, in every industry. From planning to development to management and security, CA is working with companies worldwide to change the way we live, transact and communicate—across mobile, private and public cloud, distributed and mainframe environments. Learn more at **ca.com**.

1 Coleman Parkes Research, "Accelerating Velocity and Customer Value with Agile and DevOps," Jan 11, 2017.; 2 IDC, "The Business Value of the Connected Mainframe for Digital Transformation," white paper sponsored by CA Technologies and IBM, Dec 2016.; 3 Arcati, "The Arcati Mainframe Yearbook 2017,"2017.; 4 Results based on CA Technologies internal analysis.; 5 TechValidate, CA Technologies Application Development customer testimonial, Oct 11, 2016, TVID F80-81B-FCD.; 6 TechValidate, CA Technologies Application Development customer testimonial, Jul 5, 2016, TVID A42-AA4-CFF.; 7 TechValidate, CA Mainframe Management Solutions case study, Feb 2017, TVID 9B8-EC9-055.; 8 Coleman Parkes Research, "Accelerating Velocity and Customer Value with Agile and DevOps," Jan 11, 2017.; 9 IT Central Station, CA Endevor SCM Review, Dec 14, 2016.