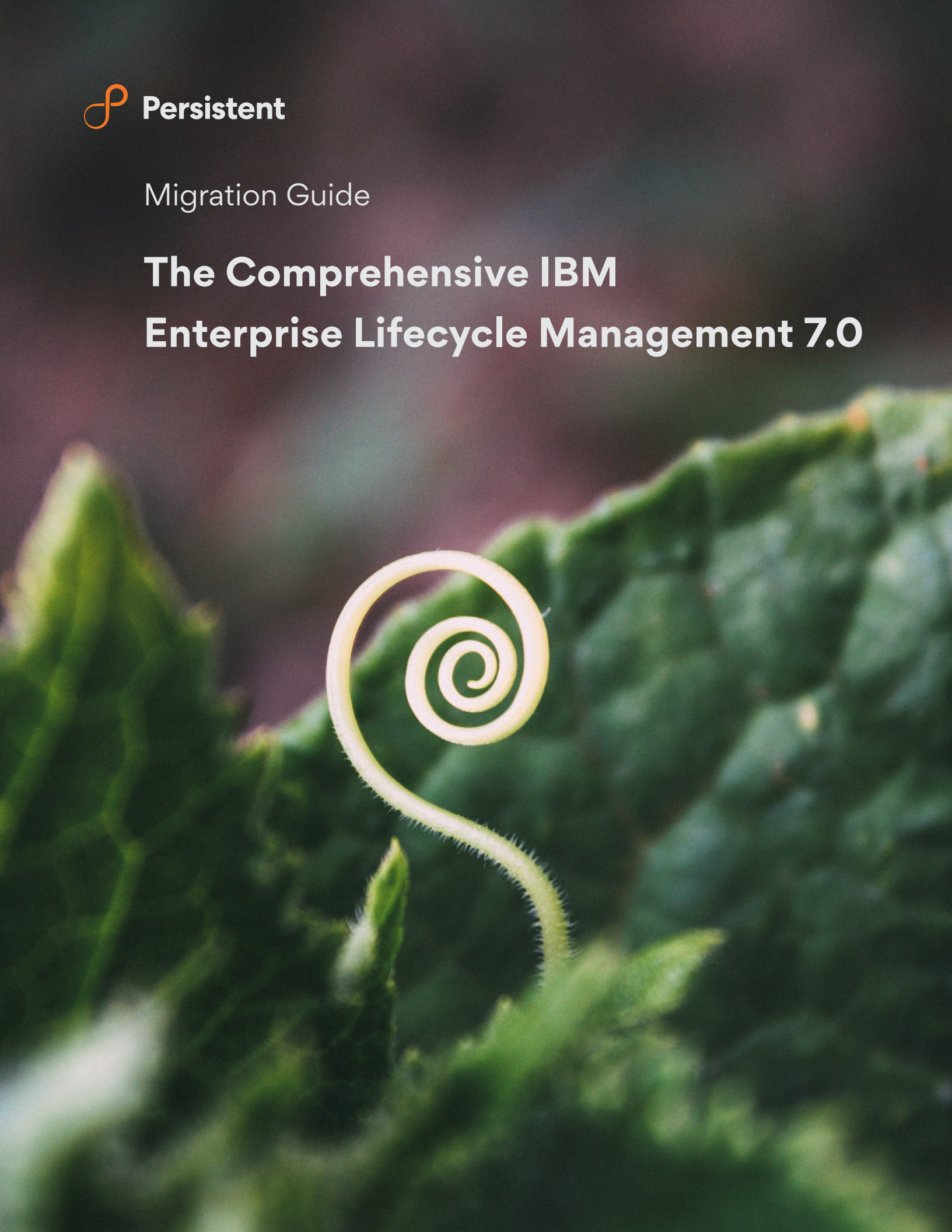
Persistent

Migration Guide

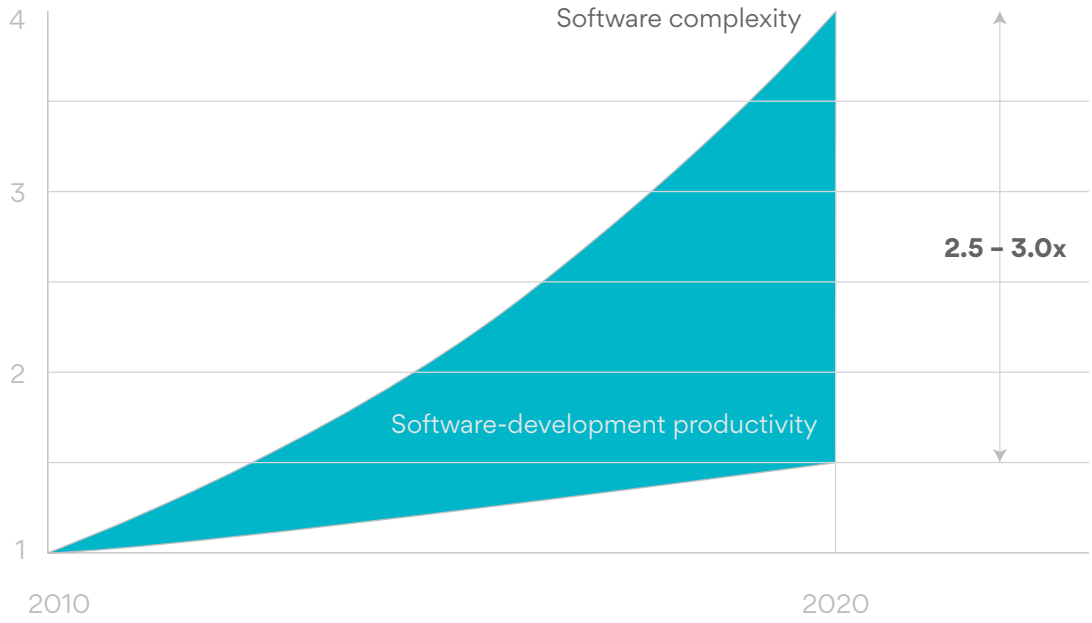
The Comprehensive IBM Enterprise Lifecycle Management 7.0



Closing the Complexity-Productivity Gap

The introduction of IBM Enterprise Lifecycle Management (ELM) version 7.0 is a major leap forward, particularly for organizations trying to keep pace with exponential increases in product complexity.

This burst in complexity has been spurred on by the increasing role software plays in product development, as seen in the chart below from McKinsey & Co. Over the last decade, software complexity has grown up to three times faster than the productivity improvements needed to support it, with no sign of slowing down.



Source: Numetrics

ELM 7.0 was developed to help organizations close that gap. According to IBM, ELM 7.0 users are getting upwards of nine times the performance and scalability version 6.x offers, depending on the database that's being used. That's due to ELM 7.0's order of magnitude increases in several critical parameters, including

- Expanding the number of requirements supported from 2 million to 20 million — encompassing the needs of nearly every global automobile manufacturer on the planet.
- Increasing the number of concurrent users from 300 to 500 — addressing the concurrency load requirements of the largest enterprise users, with plans to expand beyond this to support application clustering.
- Exponentially growing the number of contributors from 25 to 2,500 — with plans to increase this in future versions of ELM 7.x.

Industrial organizations and manufacturers of complex products – aerospace, automotive, medical devices, and others – need the scalability benefits ELM 7.0 offers, not to mention the stability, reliability, consistency, traceability, and speed ELM 6.x users are accustomed to. But upgrading mission critical systems like ELM to the latest major release isn't as simple as updating your phone's operating system, and the consequences of migration mistakes can be costly.

The Voice of IBM ELM Experience

As the IBM partner responsible for developing and supporting ELM 6.x and 7.0, Persistent has unique knowledge about the inner workings of the entire toolset. Our thousands of developers worldwide use ELM every day to support our own product development, so we understand the front end of the applications just as well. In addition, our veteran migration teams have successfully performed hundreds of ELM migrations from as far back as 2009 (when the toolset was known as IBM Collaborative Lifecycle Management). It's safe to say nobody understands IBM ELM better than Persistent.

We developed this ELM 7.0 Migration Guide for any industrial organization who wants to harness the power of ELM 7.0 to turn the tide of the complexity battle — and do it as quickly, seamlessly and successfully as possible.

Why you Need this Guide

ELM comes equipped with a set of migration automation scripts and upgrade wizards intended to help organizations transition seamlessly from 6.x to 7.0, supported by an online knowledge center that documents how to run them. So, it's fair to ask — with all these resources already available, what's the purpose of this guide?

The existing resources may be all you need if your organization meets one of these two conditions:

1\ You already have experience upgrading ELM from one major release to another in your existing environment, and your governance team has allocated the resources needed to ensure the migration is successful.

2\ You're able to spend the time needed to set up a pre-production environment and practice rehearsing the scripts, extensively documenting the steps you need to take beforehand to make sure everything goes off without a hitch in your production environment.

With potentially millions of requirements, models and artifacts to migrate from one release to the next, any missteps during migration rehearsal (or worse yet, during production migration) can be very difficult and time-consuming to track down and unsnarl, leaving your operations frozen in place or stuck on a previous version while your userbase waits patiently to get hands on their upgraded tools.

If you've checked one of the boxes above and are ready to forge ahead, here are 7 keys to ELM 7.0 migration success to consider as you begin your planning effort.

7 Keys to ELM 7.0 Migration Success

1\ When should you migrate? The answer may depend on your database

IBM ELM supports Oracle, DB2 and SQL relational databases, but the re-platforming of DOORS Next — ELM's requirements management tool — to support exponential increases in complexity required a re-write of the queries and repository calls for each, in order to maintain the speed that users of ELM 6.x are accustomed to.

At the time of this writing (Spring 2020) ELM 7.0 has been fully optimized for Oracle and DB2 databases, which means migrations and installations are meeting all performance metrics.

SQL Server implementations are significantly different than Oracle and DB2, enough so that optimization efforts for SQL-specific environments are still underway. Until they're completed, both migration performance and operating performance post-migration will likely be lower than Oracle and DB2 environments.

If your organization is based on Oracle or DB2 databases, you may migrate at any time, knowing the toolset is already optimized for your use.

If your organization is based on SQL Server, we recommend holding off on your migration until those optimization efforts have been completed. If you're running SQL Server today and want to know when you can migrate with confidence, just contact us at the information at the bottom of this report and we'll share the latest progress updates.

2\ How big is your window?

Every ELM migration takes time to complete, during with the tools must remain completely offline. The length of the outage window is less than 48 hours in most cases, dependent on several criteria

- The size of your data repository
- The data shapes within the repository
- Number of variants
- Number of configurations
- Number of streams
- Number of baselines
- Volume of change sets

The other critical variable is your current reliance on ELM's multi-server capability. Organizations that rely heavily on this capability and use global configurations, you'll need to run the Link Index Provider (LDX) tool to maintain all the traceability information during the re-indexing process. If your link densities are high or your need to maintain traceability information for your customers is essential, this can also expand your migration windows.

There are two ways to accurately estimate how long your outage window will be

1\ You can prepare a staging environment and conduct a test run of your migration using your production data in that environment.

2\ You can contact an experienced migration expert like Persistent to assess your criteria above and provide guidance on the migration window you should consider for planning, based on our experience conducting hundreds of similar migrations over the years.

Most ELM migrations can be easily accomplished over a weekend, whereas larger repositories may need to be done in stages over a series of weekends to minimize disruption and ensure seamless operations throughout the migration.

Don't overlook this vital step before you begin your migration, or your business continuity may pay the price.

3\ Creating the right environment

Creating the right pre-production environment is a critical step to a successful migration. Follow these steps to position your organization for success.

\ Start with a snapshot of your production data — don't use sample data or a subset. The best way to prepare for your production migration is to use the real data.

\ Re-name the server so it uses the URLs for the pre-production server, then upgrade against that data.

\ If you needed to roll back at any point, you simply go back to your database backup that you started from and repeat those steps.

By creating your pre-production environment in this manner, you're always able to mimic your real-world data needs as closely as possible, and in the event of a rollback you'll just start over from your baseline, which is your backup.

4\ Integration of in-house widgets

ELM systems are rarely standalone systems; in fact, most integrate with a variety of other applications to help expedite the free flow of data throughout the technology stack. Some of these connectors are APIs provided by the developers, while others are widgets designed in house for a specific need.

As organizations consider their migration path to ELM 7.0, they should not assume those in-house widgets will continue to function as intended — tor at all — without additional resources. As you plan your migration, take inventory of your in-house widgets, including:

\ Atlassian Jira

\ Integration hubs like Tasktop and Persistent's UNITE

\ HP Quality Center (HPQC)

\ Product Lifecycle Management systems like Windchill and Dassault Systèmes® ENOVIA®

\ Private APIs

\ SPARQL queries

Once the inventory is complete, it's important to assess the criticality of your integration with these other tools; if critical functionality is a concern, we recommend conduct proof-of-concept testing in a staging environment before moving to a full production migration.

5\ Accomodating changes in infrastructure

The re-platforming of ELM 7.0 and the focus on accommodating an exponential increase in requirements has led to a fundamental shift in the infrastructure needs of on-premise installations.

ELM 6.x installations place a heavy load on the application server, with less throughput needed to support the database. With ELM 7.0, the load has shifted — the app server requirements have lessened and the database requirements have increased.

To ensure you have enough compute, storage and networking resources allocated in advance of your ELM 7.0 migration, check the IBM ELM 7.0 Sizing Guide on Jazz.net.

You'll be much better off if you make these infrastructure adjustments in advance and then test them in a staging environment to ensure that none

of your core workflows will be affected, and you'll be able to maximize the performance of your ELM 7.0 toolset on day one.

6\ Prepare to re-evaluate legacy processes

In order to increase capacity from 2 million requirements in ELM 6.x to 20 million in ELM 7.0, some re-platforming was needed to ensure ELM's tools are built to scale as quickly as product complexity does.

That means current DOORS 9 users will need to be prepared to change some of their familiar actions as they embrace DOORS Next. For example, triggers and scripts that have been written on DOORS 9 may no longer work as intended (or at all) on DOORS Next.

We also know some DOORS 9 users are used to capturing all the testing done against the requirements inside DOORS 9, which may inhibit performance in the new DOORS Next environment. DOORS 9 and DOORS Next are the requirements management repositories for the ELM toolset; they aren't the ideal location to house testing information.

Instead, those artifacts should be captured in the Engineering Test Management (ETM) tool, previously known as Rational Quality Manager (RQM), which was purpose-built for that type of data.

Organizations that want to leverage the benefits or ELM 7.0 will want to do more than just commit the resources to migrate the toolset properly. They should also take that migration planning time to adjust their workstyles and processes to ensure the scalability benefits are maximized today, and can continue to scale with their product complexity needs.

Maximizing ROI for any major software integration is more than just implementing the software alone — it's also a rare opportunity to ensure people, processes and platforms are wring every bit of performance and productivity gains possible out of the software investment, and an ELM 7.0 migration is certainly one such opportunity.

7\ User communications & training

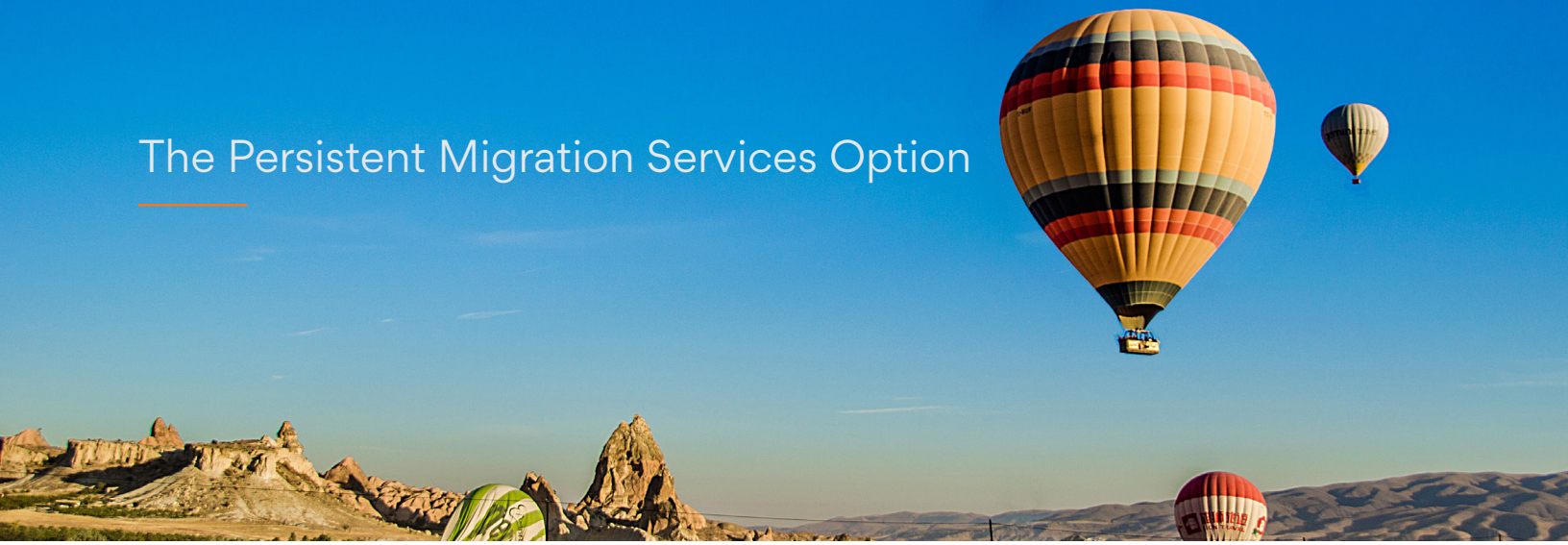
In addition to the considerable backend changes necessary to deliver exponential increases in scalability, ELM 7.0 also has an updated look and feel. Many of the workflows remain unchanged, but it would be a shock to unprepared users if they arrived on Monday morning to a brand-new interface.

Prior to your ELM 7.0 migration, we recommend running a "New & Noteworthy" training for all current and prospective ELM users, now that the user limits have been expanded. This training should cover:

- The benefits of the migration from 6.X to 7.0.
- How workflows have been optimized to maximize scalability and productivity.
- What processes may need to be updated to maximize the potential of the new tools.
- How the interface differs from previous versions.
- What in-house widgets may not be fully functional on day one.
- What other changes users can expect after the migration is complete.
- How they'll be more effective, more efficient and more productive as a result of this migration.

That way, when hundreds or thousands of users arrive log in the next business day, they'll be ready to begin making the most of ELM 7.0 right away.

The Persistent Migration Services Option



By following the 7 Keys to ELM 7.0 Migration Success above, along with the built-in migration tools, wizards and online documentation available, you'll be giving your organization the best possible chance for a successful migration.

If we could summarize our experience in a sentence, it would be there are no shortcuts. ELM migrations are complex, and any missed step in the process can force a rollback and impact your business continuity.

We recognize that some organizations may seek expert assistance with their ELM migration to capture the benefits ELM 7.0 offers without the risk and uncertainty of a migration effort. For those organizations, we offer ELM 7.0 Migration Services from Persistent.

- Mitigate their risk
- Accelerate their migration and time to value
- Maximize their chance for a successful migration
- Stay focused on their core business
- Get it done right the first time

ELM 7.0 Migration Services from Persistent is for industrial organizations that want to

Our ELM 7.0 Migration Services team will work closely with your project leaders and users to chart the best and fastest path forward, applying the experiences of several hundred successful IBM ELM (previously IBM CE) migrations to your specific environment and needs.

In the span of a several weeks, our Migration Services team will

1\ Establish a pre-production environment

2\ Run rehearsals using your production data

3\ Test the migrated data for completeness and integrity

4\ Estimate the duration of the migration window

5\ Plan the outages for minimal disruption

6\ Conduct any advance user briefings

7\ Seamlessly migrate your production environment to take full advantage of ELM 7.0

ELM 7.0 is a powerful response to the massive increases in product complexity experiences over the last decade, driven by the exponential increases is software complexity in industries like automotive, aerospace and medical devices.

To help industrial organizations get a deeper understanding of ELM, Persistent has developed a series of ten webinars titled "Supercharging ELM" related to specific aspects of ELM, integration with other modern manufacturing platforms and open standards, and industry and OEM compliance.

For organizations that would like to find out how their organizations can better manage their growing product complexity as quickly as possible while also mitigating their migration risks, contact ELM 7.0 Migration Services from Persistent at info@persistent.com.

About the Author

Geoffrey Clemm
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To fulfil his role as a distinguished engineer for Persistent, Geoffrey Clemm relies on more than 30 years of industrial experience designing, implementing, and deploying software development tools. His primary responsibilities include IBM's Engineering Lifecycle Management (ELM) offerings and Software Configuration Management technologies.

Geoff is the primary author of RFC-3253, the standard versioning protocol of the Internet Engineering Task Force (IETF), and he is the specification lead for JSR-147, the Java Community Process (JCP) standard versioning API.

In addition to his development responsibilities, Geoff is the technical advocate for a set of large enterprise early adopter customers, where he guides their deployment and usage of the ELM solution.

Geoff holds a bachelor's degree in Applied Mathematics from Harvard College, as well as a Ph.D. in Computer Science from the University of Colorado at Boulder.