PARASOFT®

CASE STUDY

Cox Automotive Drives Down Defects With End-to-End Testing

OVERVIEW

Cox Automotive provides the digital infrastructure for the new and used car market. They're the company behind well-known brands such as Kelley Blue Book, the Most Trusted Resource for used car pricing.

If you have bought a car, your dealer would have touched one of their components. Cox Automotive provides digital services for the buyer, the dealer, and the lender that make car buying, shopping, and servicing easy. They're the backbone of the industry.

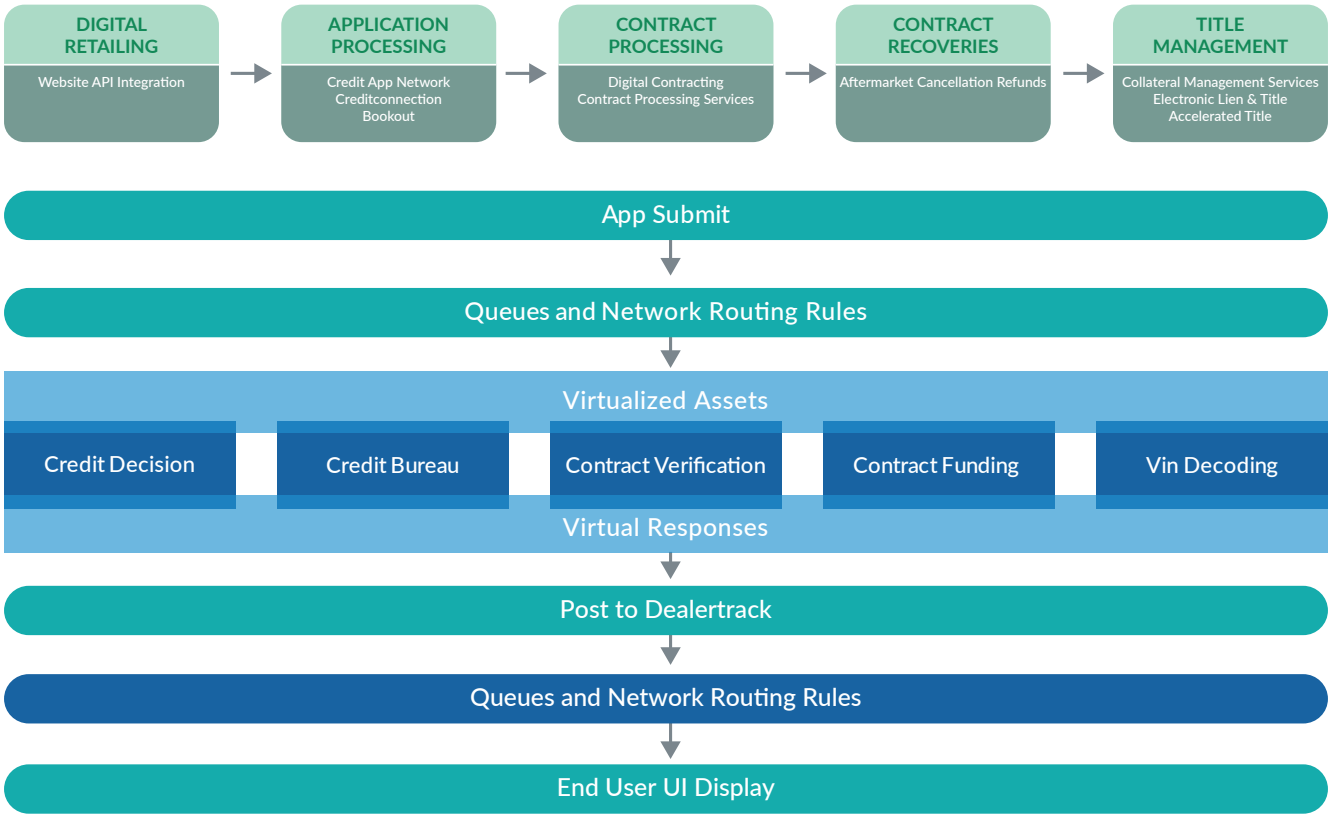
Dealertrack, a subsidiary of Cox Automotive, provides accurate retail sales data that includes dealer management systems (DMS), sales and financing solutions, and complete vehicle registration and title management. Much like financial technology companies, Dealertrack is mission-critical with no room for failure or downtime.

ESCAPED DEFECTS **<5%**	URGENT DEFECTS AGING **<7 DAYS**
SYSTEM AVAILABILITY **+99.97%**	REDUCED DOWNTIME **>50%**

THE CHALLENGE

The biggest challenge for Cox Automotive, and Dealertrack in particular, is the sheer scale of the services they offer. Dealertrack services the entire car dealership network in North America from the time a customer enters a dealership and sits down with a salesperson, to financing, contracting and signing (online and in-store), registration and titling, to the delivery of the vehicle.

There's a large number of services at play and the dependencies inherent in such a complex system means that even small changes can have significant ripple effects in the entire system. The following diagram provides a top-level overview of the Dealertrack services and system architecture.



Transactional systems are by nature difficult to test. The Dealertrack application has many layers underneath including a lender network, application processing, contract processing, contract recoveries, and title management. All of this is designed in a manner for online and in-store purchases. The biggest challenge for adding features or updates was a large number of connections and integrations of new and legacy systems with no control over the availability of these dependencies. They must ensure that transactions are accurate and data is secure throughout the environment.

Figure 1:
A top-level view of Cox Automotive Dealertrack services architecture

> *"I would call our challenge a 'perfect storm.' We have large data centers with numerous network segments—each containing thousands of servers, and many, many services. Our problem was we were having too many incidents, too much downtime, and many client issues to resolve."*
>
> —Roya Montazeri, Senior Director of Quality at Cox Automotive

In light of this perfect storm, Cox Automotive decided to attack it head-on with a new quality initiative where they would focus on a single, achievable, key performance initiative (KPI). Rather than get caught up in tracking multiple KPIs, Cox Automotive chose to reduce escaped defects by 5%. Although a simple goal, it required rethinking their quality processes, particularly their end-to-end testing.

THE APPROACH

Service virtualization was a natural fit for Cox Automotive to help them achieve their goals. Given their mission-critical application and the sheer scale of their service offering, service virtualization allows them to isolate applications under development without affecting, or being affected by, the vast dependencies in the operating environment.

Before diving into service virtualization Cox Automotive needed to improve its testing practices as part of the new tool adoption. There was existing nonfunctional testing in some areas, but not others and there were inconsistencies. The same situation existed for performance testing.

The problem they faced was that although they had Agile processes and the tools to support it, they still needed more control and governance over their testing practice. Once their testing practice was in order, they'd move on to improving their test automation.

THE SOLUTION

Cox Automotive took a holistic approach to their goal of reducing their escaped defects by 5%. They put in the necessary quality controls and practices to improve their end-to-end functional and performance testing. They also improved their test and release management practices. Their test automation focus was clearly set on virtualization.

> *"Virtualization was the best thing that could happen to us in the way that it enables us to test the right thing at the right time. We already had many automation tools and could have some ability to mimic component behavior, but it wasn't what we needed. We needed our virtualization services fast, because our problem was here and now, right in our lap."*
>
> —Roya Montazeri, Senior Director of Quality at Cox Automotive

Being able to isolate individual services allowed Cox Automotive to concentrate on the specific area of the application they wanted to test. They achieved buy-in from development, the people who faced these problems every day, by working with Parasoft on a small proof of concept (POC) that was a real-world slice of their test scenarios.

In some cases, the transition experienced bumps along the way. Not everyone had bought into the need for service virtualization. This was a case of training and familiarity with the concepts and tools. To remedy this, Cox Automotive created the center of excellence (COE) team to invest in service virtualization and the adoption of this new test automation capability across the organization.

Cox Automotive is using service virtualization for more than just testing. The implementation team is using these virtualized services to simplify the development of new features. They can also use these virtual services to help demonstrate new functionality to their clients.

THE RESULTS

Parasoft assisted Cox Automotive with their POC and training rollout plan of service virtualization with Parasoft Virtualize delivered through online training for the team. By working directly with Parasoft, Cox Automotive was able to train their team and enable many teams across the organization.

Although the journey hasn't been easy for Cox Automotive, transforming their testing practice provided a lot of eye-opening information for the quality assurance team along with the development and implementation teams, and client services.

Once the organization was trained and up to speed on its service virtualization rollout, the return on its investment started to pay off. Components with higher and more mature use of Parasoft Virtualize already exceed their KPI of less than 5% escaped defects.

They were so successful that Cox Automotive is adjusting this KPI for the upcoming year. By addressing the overall process and improving the resilience of their platform, they significantly reduced downtime and defects.

> *"We totally achieved our escaped defect KPI, same with our defect aging goal of no more than seven days to respond to urgent defects. When it comes to our availability, we really are at 99.97%. So, I will say, yes, we achieved and accomplished our goals through a true partnership with Parasoft."*
> —Roya Montazeri, Senior Director of Quality at Cox Automotive

So, mission accomplished for Cox Automotive. They still have more work to do as they migrate their many legacy services and components that need better testing processes. As they continue to add and update services, they are proactively thinking about how each service needs to be virtualized during the development cycle. Cox Automotive has cultivated a test-first approach toward software development and instilled a disciplined process to scale testing end-to-end and ensure their continued success across the whole practice.

> *"Today, our virtual assets are as important as our code."*
> —Roya Montazeri, Senior Director of Quality at Cox Automotive

Cox Automotive views their investment in positive terms to the point where they consider their virtual assets as important as code. The Cox Automotive team appreciates that Parasoft has a long-term roadmap that enables them to support and sustain their virtual assets for years to come.

TAKE THE NEXT STEP

Identify the critical features and key capabilities your team needs to successfully adopt service virtualization and maximize ROI.
Download the whitepaper.

ABOUT PARASOFT

Parasoft helps organizations continuously deliver quality software with its market-proven, integrated suite of automated software testing tools. Supporting the embedded, enterprise, and IoT markets, Parasoft's technologies reduce the time, effort, and cost of delivering secure, reliable, and compliant software by integrating everything from deep code analysis and unit testing to web UI and API testing, plus service virtualization and complete code coverage, into the delivery pipeline. Bringing all this together, Parasoft's award-winning reporting and analytics dashboard delivers a centralized view of quality enabling organizations to deliver with confidence and succeed in today's most strategic ecosystems and development initiatives—security, safety-critical, Agile, DevOps, and continuous testing.