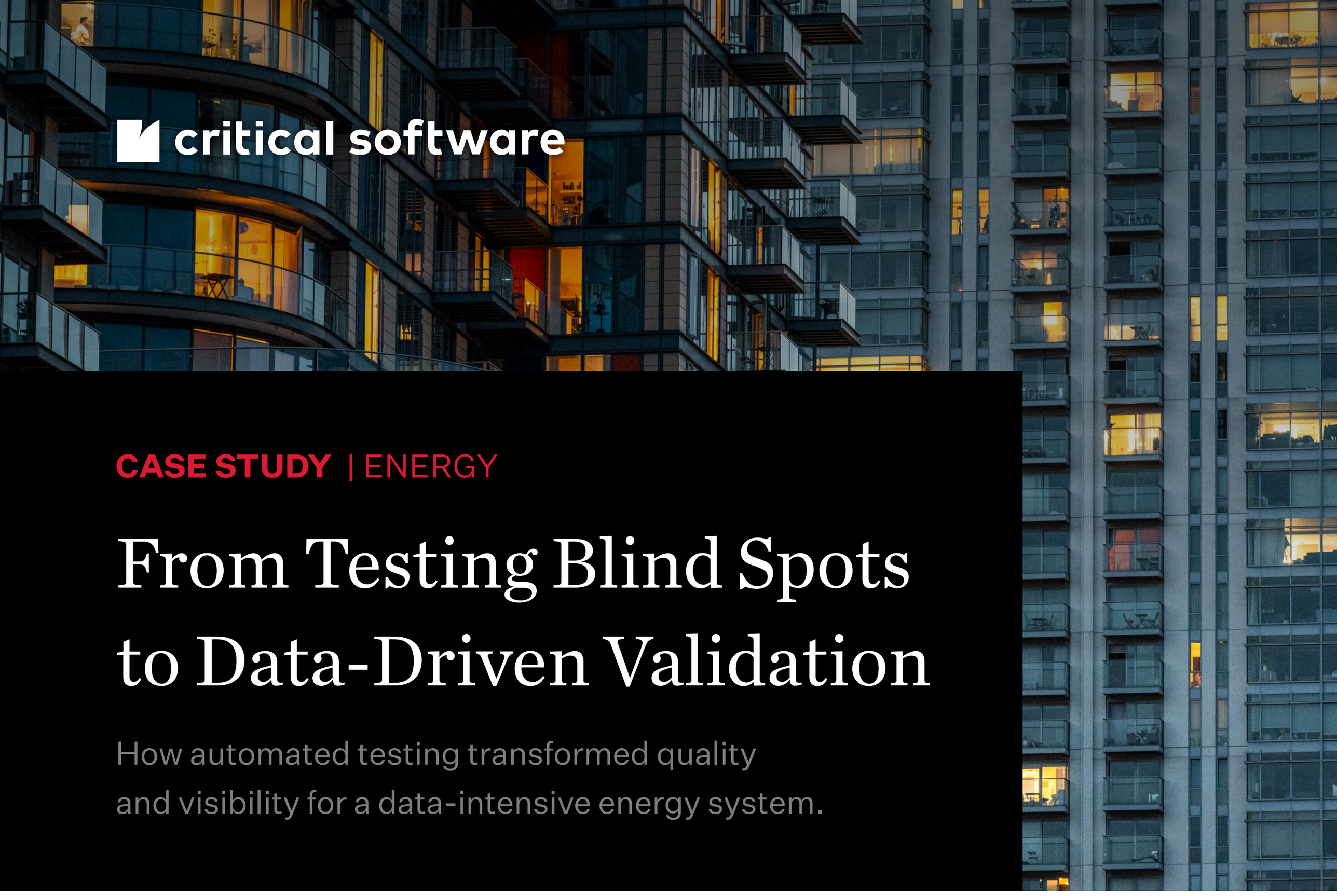

critical software

CASE STUDY | ENERGY

From Testing Blind Spots to Data-Driven Validation

How automated testing transformed quality and visibility for a data-intensive energy system.

The challenge

As energy systems become increasingly software-defined and data-intensive, testing visibility and performance validation are becoming critical to operational reliability. The client operates a complex data-driven system where reliability and timeliness are critical. However, testing at the component level relied heavily on manual processes, limiting coverage and slowing feedback.

Key challenges included:

- Gaps in functional validation across data pipelines
- No end-to-end visibility of data flow behavior
- Lack of performance testing and measurable metrics
- Inability to confirm suspected issues under load

Initial assessments identified these gaps as a direct risk to product quality and release confidence. The client needed a scalable, repeatable approach to improve both functional validation and performance insight.

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The solution

Critical Software implemented an automated testing capability combining functional and performance validation.

- A suite of more than 110 automated test cases covering data availability, scheduling, configuration, and payload accuracy
- A performance testing framework with scheduled and on-demand modes to simulate real usage patterns
- Real-time monitoring of latency, CPU, memory, network throughput, and packet loss
- Live dashboards and reporting for immediate visibility and historical analysis
- CI/CD integration to enable continuous, environment-aware test execution

The solution was designed to be reusable, configurable, and easy to scale across environments and providers.

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CASE STUDY| ENERGY:

FROM TESTING BLIND SPOTS TO DATA-DRIVEN VALIDATION

The Results

- 110+ automated test cases enabled consistent validation of critical data flows and system behaviors
- Earlier defect detection reduced exposure to functional and regression issues
- Real-time performance visibility gave the client first-time insight into system behavior under operational load
- Data-driven decision-making replaced assumptions, improving release confidence
- Integrated testing supported faster feedback loops and continuous delivery

The client gained a reliable, scalable testing capability — enabling more dependable releases, earlier defect detection, and improved operational visibility across complex data-driven systems.

