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CASE STUDY | ENERGY

Powering Digital Twins at Scale

How a large energy-sector client built a zero-downtime, bare-metal Kubernetes and clustered-storage foundation to power its digital twin platform at scale.



The Challenge

An energy-sector client operates a demanding digital twin platform, spinning up complete replicas of wind farm network environments to enable safe, realistic testing at scale. Behind the scenes, these workloads push infrastructure to its limits: heavy concurrent I/O on shared storage, rapid environment cloning, and zero tolerance for downtime.

As adoption grew, the platform needed what few teams can provide: true end-to-end ownership of a bare-metal Kubernetes and clustered-storage estate, with the deep systems expertise to keep it fast, stable, and ready to scale.

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The Solution

Critical Software took full ownership of the infrastructure layer: a bare-metal Kubernetes cluster built on an OCFS2 clustered filesystem over enterprise Fibre Channel SAN, the copy-on-write storage foundation that makes instant environment cloning possible.

The team brought kernel-level engineering depth to the platform, spanning day-to-day operations and long-term platform evolution. Key elements of the engagement included:

- Forensic root-cause analysis of complex storage and cluster behavior, resolving issues at the kernel level.
- Proactive monitoring with automated remediation, catching issues before they affect testing workloads.
- Policy-as-code governance, hardening the platform against configuration drift.
- Ongoing ownership through the platform's scale-up phase, ensuring infrastructure keeps pace with adoption.

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The Results

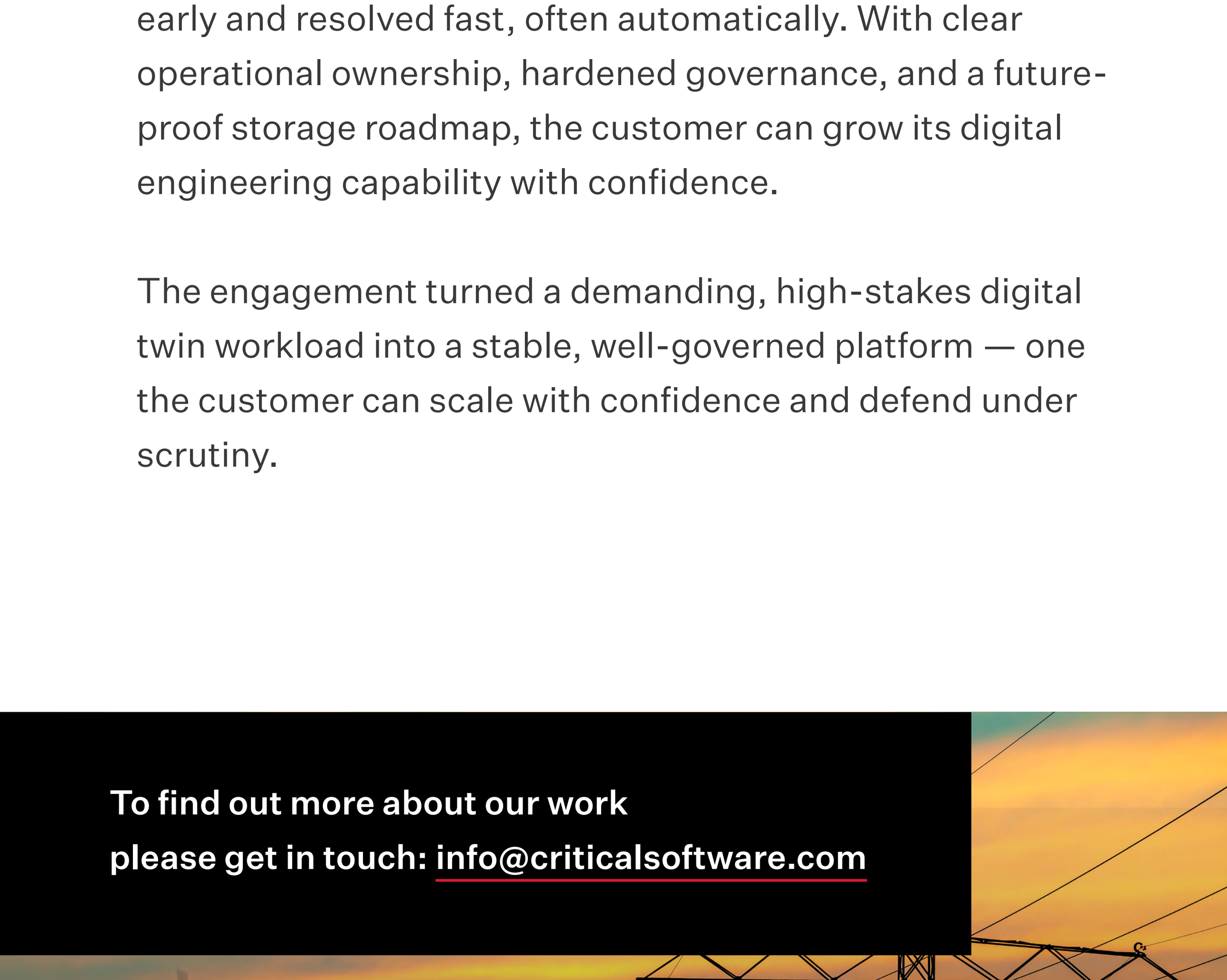
A rock-solid foundation for the customer’s digital twin workloads: engineering teams now clone and test full network environments in minutes, backed by infrastructure they can trust.

Platform stability and availability improved measurably. Issues that once required lengthy outages are now detected early and resolved fast, often automatically. With clear operational ownership, hardened governance, and a future-proof storage roadmap, the customer can grow its digital engineering capability with confidence.

The engagement turned a demanding, high-stakes digital twin workload into a stable, well-governed platform — one the customer can scale with confidence and defend under scrutiny.

To find out more about our work

please get in touch: info@criticalsoftware.com



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