CASE STUDY

RADAPEX
TECH & DATA SOLUTIONS

Preventing App Failures Under Heavy Load: RADAPEX's K6 Solution

Many client applications struggle to maintain performance under increasing user demand, leading to crashes and service interruptions. Ensuring reliability and scalability is no longer optional, it's critical for maintaining user trust and operational efficiency. RADAPEX partnered with clients to implement rigorous load testing using k6, identifying performance bottlenecks and optimizing system resilience. This approach helped safeguard applications against failures, ensuring stability, regulatory compliance and user trust.

The Challenge

While out of the box, Oracle APEX and ORDS is a pretty robust, battle proven and production ready tool, for applications that receive thousands or even hundreds of thousands of users, a more bespoke solution can be required. For a recent client, that's where RADAPEX stepped in, leveraging the power of K6, an open source tool by Grafana to simulate hundreds of thousands of requests against test infrastructure.

RADAPEX's responsibilities included:

- Addressing limitations of legacy systems lacking scalability for high user loads.
- Enhancing system performance and reliability to handle hundreds of thousands of concurrent requests.
- Identifying and mitigating potential bottlenecks or failures in critical applications.
- Ensuring applications are robust, production-ready, and capable of sustaining heavy traffic.
- Supporting internal teams with expertise in performance optimization and load testing.

RADAPEX did all this with minimal user downtime, leveraging staging environments, green/blue deployments along with a distributed deployment of K6 to replicate real world, global application usage.

RADAPEX Solution

RADAPEX implemented a comprehensive performance enhancement based on the following key stages:

> "RADAPEX empowers clients to prevent app failures before they happen, delivering resilient digital experiences even under peak demand."

1. Manually investigate and identify bottlenecks

We conducted thorough investigation into web service configuration files, infrastructure configuration and database configuration. Every deployment is different and whether it be on-premise, cloud or even hybrid cloud we look for:

- Common configuration issues
- Opportunities to optimize performance
- Gaps in best practice implementation
- Potential security vulnerabilities
- Areas for reducing cloud infrastructure costs

2. Run automated performance tests, powered by K6
Once we have got a good understanding of your infrastructure, we run our bespoke performance suite, powered by K6. Leveraging IaC (Infrastructure as Code) we can deploy K6 across the globe to simulate massive amounts of global traffic, preparing your application for anything. Our K6 load testing can detect:

- **Issues in scalability**, identifying bottlenecks before they impact performance.
- **Performance degradation**, tracking response times, throughput, and latency.
- **Infrastructure misconfigurations**, revealing weaknesses in autoscaling, caching, or networking.
- **Database and ORDS constraints**, analyzing backend performance under peak conditions.
- **User experience bottlenecks**, pinpointing where performance dips along the user journey.

3. Use industry standards and best practices to make infrastructure scale
Once we've identified areas for improvement, we align your infrastructure with proven industry standards and best practices. By leveraging modern design principles, automation, and standardized deployment patterns, we ensure your systems are scalable, resilient, and easy to manage as demand grows, both on-premise and in the cloud. Our infrastructure optimization focuses on fixing any and all issues identified in the previous stages. Turning non-performant and potentially legacy code into clean, best practice infrastructure deployments, all powered where possible by IaC, making it deployable and maintainable by your dedicated IT teams.

Our solutions come with powerful logging and metrics, turning a confusing myriad of systems into clear, actionable information on how your applications are performing. All presented in easy to understand Grafana dashboards.

4. Measure and report impact with specialised metrics

After implementing our solutions, we utilise the metrics and logging platforms established earlier to provide clear, data-driven evidence of performance improvements. These results are presented through well-defined, easily interpretable metrics and visualised in intuitive dashboards, ensuring

About RADAPEX

RADAPEX simplifies processes, strengthens evidence based decision making and delivers measurable efficiencies. With over a decade of experience, we integrate advanced technology with the unique priorities of the sector, enabling more effective, accountable, and resilient outcomes.

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stakeholders can quickly assess the tangible impact of our performance enhancements.

Results

Within 12 months, out of the applications RADAPEX addressed, Clients achieved significant improvements:

What We Measured	Before RADAPEX	After RADAPEX
Average Page Response Time	1.5 seconds	0.7 seconds
Consistency Under Load	Slowed down when many users visited	Stayed fast even with heavy traffic
Reliability (Error Rate)	3.8% of requests failed	Only 0.2% failed

Conclusion

RADAPEX is instrumental in helping organizations strengthen their digital infrastructure through cutting-edge performance testing and benchmarking. By integrating compliance, usability, and innovation, we help clients mitigate legal risks from potential outages while boosting user trust in their applications.