

White Paper

# Site Reliability Engineering

The key to successful scale events

**rackspace**





# Opportunity and risk

Scale events — like online sales and digital product launches — present great revenue opportunities, but they also present large risks to your business. Whether you are a retailer preparing for Black Friday and Cyber Monday, or a digital vendor launching a new service, your brand is both at its most visible and its most vulnerable during these scale events. Many more customers visit your site over a short period of time, raising the potential for resource constraints and discovery of software bugs. Information about issues spreads quickly via social media and news outlets. And, your customers typically spend more per transaction, so every lost order has a greater negative impact on your bottom line.

Site reliability engineering (SRE) can help you better prepare for scale events through an iterative cycle of data-driven improvement.

*Adobe predicts \$124.1 billion in online sales during the 2018 shopping season, a 14.8% increase over 2017 sales.<sup>1</sup>*

## What is SRE?

SRE uses a well-defined DevOps approach to create an iterative cycle of data-driven improvement for your website and operations, ensuring they can support even the biggest scale events. SRE implements automated processes and systems to enhance the reliability of current manual processes. It also creates a shared responsibility for availability across your organization, helping to align teams and speed response times. Site reliability engineers work in a combined development and operational capacity to achieve availability, latency, and performance goals for a service.

A key part of the SRE process is understanding and embracing risk. With SRE, you can better:

- Measure your operational realities
- Identify your tolerances and expectations
- Understand both infrastructure and opportunity costs
- Establish actionable targets for operations

Each SRE cycle includes logical steps to help you advance your business:

1. Define your objectives
2. Assess your risks
3. Analyze your data
4. Adapt your

### Step 1: Establish your objectives

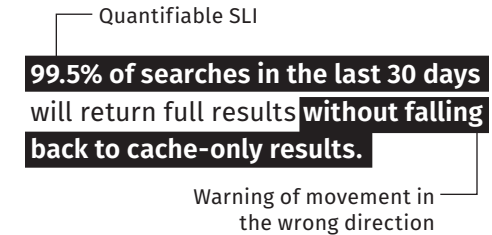
Service level objectives (SLOs) are at the core of SRE. Defining clear objectives for success can help to align operations, development, and your overall business. They can also serve as a communication tool to reduce office politics and increase focus on end goals.

Good SLOs are based on market and customer expectations and correlate to customer satisfaction and commercial success. They should reflect your customers' actual experiences using your application or website and how well you are meeting their expectations. They should also include quantifiable service level indicators (SLIs) as well as warnings of movement in the wrong direction. For example, you might set an SLO as 99.5% of searches in the previous 30 days will return full results without falling back to cache-only results.

### Service Level Indicators (SLI)

$$SLI = \left( \frac{\text{GOOD EVENTS}}{\text{VALID EVENTS}} \right) \times 100\%$$

### Example SLO

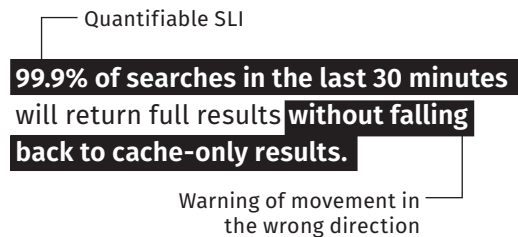


## Step 2: Assess your actual risks

SLOs can help you both avoid and embrace risk by defining your problem space and quantifying the associated risks. Good performance against your SLOs can help you justify things like faster development, while poor performance can call your attention back to reliability and stability initiatives.

Understanding your actual, real risks is a critical and ongoing process. SRE can help you identify and catalog your risks based on dimensions like time to detection, time to resolution, time between failures and how the impact changes with scale. As such, due to the outsize influence of Black Friday on overall sales, you might tighten up your SLO for that event to 99.9% of searches in the previous 30 minutes will return full results without falling back to cache-only results.

### Example Black Friday SLO



## Step 3: Collect and analyze your data

To create a feedback loop, you need data. Data tells you if you've met your SLOs, validates your risk assessments, and allows you to make informed decisions. This requires instrumentation for automating data collection, monitoring results, and analyzing data on an ongoing basis. Your system should provide information with multiple levels of detail and complexity that can be easily accessed via dashboards. Users should be able to filter and drill down to data for individual SLIs as well as create

rollup summary reports. Raw data should be stored as a backup and for specialized uses.

Before each scale event, use your data to validate your SLOs and risk assessments. Then, make sure clear historical data is available during the event to identify differences and better understand how to respond to incidents. Review and analyze your data after the event to learn what went right, what went wrong, and what may have been overengineered.

## Step 4: Adapt your operations

Data collection and analysis can give you visibility into your processes, but they must be followed by action. Based on your data and SLOs, error budgets can help you make better decisions about your operations. Error budgets are the amount of time that you expect to spend in breach of your SLO. Tracking your error budget over that time period can help you decide when to take risks and when to focus on reliability.

### SLOs and error budget



If you have not exceeded your error budget:

- Development teams focus on features
- Operation teams focus on rollouts
- Product teams focus on new product features

For example, if you are near the end of the period and have a significant amount of error budget left, you might consider accelerating the development and testing cycle of a new feature.



If you have exceeded your error budget:

- Development teams focus on improving reliability
- Operations teams focus on fixing breaks and stability
- Product teams focus on meeting existing client needs

If you're in the middle of the period and have only a fraction of your error budget remaining, you might hold off on a release to reduce risk.

## Build your SRE practice

Rackspace is an expert in scale event support and SRE. We have more than 2.5 million hours of experience in supporting scale events and manage more than 8,000 ecommerce websites. We have supported nearly 55,000 scale events, including product launches and holidays. Our Fanatical Support and managed services approach has been proven over 20 years of operation. Hundreds of Rackspace engineers are certified on Google Cloud Platform. Rackspace is the also first premier managed services provider for Google Cloud Platform.

Rackspace can help you implement SRE in your organization. Our user experience-focused approach helps you:

- Analyze data and apply resources
- Create target outcomes
- Perform real risk assessments
- Instrument, monitor, and automate your operations

Based on Google Cloud Platform, we offer several Fanatical Support service levels to match your needs and help you make your scale events successful.



These services are supported by the Rackspace Black Friday Tactical Operations Team. Through lectures, labs and interactive training sessions, Rackspace customer reliability engineers (CREs) work with you to assess, plan and prepare for your next scale event. CREs will:

- Teach you about SRE principles
- Integrate Rackspace and Google Cloud Platform tools into your analysis operations
- Collect meaningful data
- Perform scale testing
- Analyze your data and test results to provide suggestions on how to improve your systems, operations, and processes

### Prepare offering

Rackspace experts provide consultation, engineering, and analysis to prepare and actively execute your scale event plan.

### Operate offering

A Rackspace operations team monitors your infrastructure and responds to incidents so you can focus on your business.

*Using Google developed frameworks, Rackspace engineers provide your team with the same SRE methodologies that Google teams use on some of the world's most reliable applications including Gmail, YouTube, Google Maps and others.*

### Now is the time to think about making scale events easier.

With SRE, you help your business stay in the black. Learn more about implementing SRE with Rackspace and Google Cloud at [go.rackspace.com/GCP-Black-Friday-Offer.html](https://go.rackspace.com/GCP-Black-Friday-Offer.html).

## About Rackspace

At Rackspace, we accelerate the value of the cloud during every phase of digital transformation. By managing apps, data, security and multiple clouds, we are the best choice to help customers get to the cloud, innovate with new technologies and maximize their IT investments. As a recognized Gartner Magic Quadrant leader, we are uniquely positioned to close the gap between the complex reality of today and the promise of tomorrow. Passionate about customer success, we provide unbiased expertise, based on proven results, across all the leading technologies. And across every interaction worldwide, we deliver Fanatical Experience™. Rackspace has been honored by Fortune, Forbes, Glassdoor and others as one of the best places to work. Learn more at [www.rackspace.com](http://www.rackspace.com) or call 1-800-961-2888.

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