



How to Define and Impelement Service Level Objectives (SLO)



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Outline

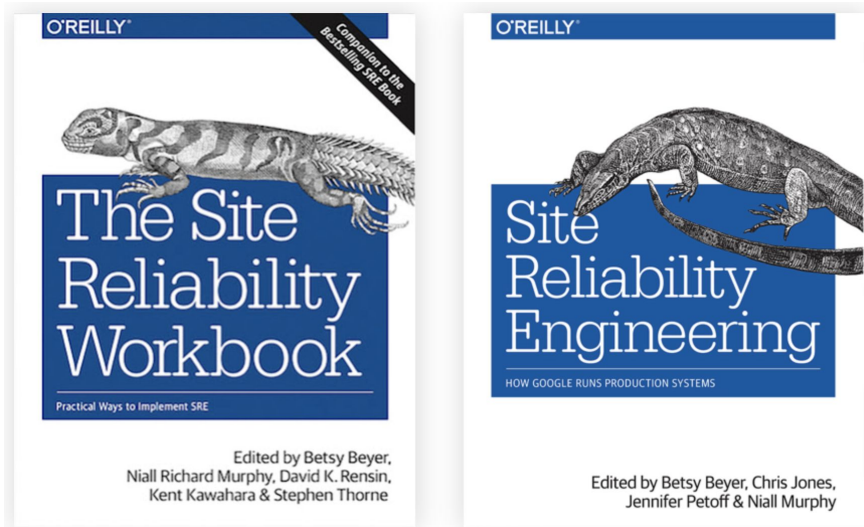


- What is Service Level Objectives (SLO)?
- Define and Implement SLO
- Operationalize SLO
- Advance Practices
- How HappyFresh implement SLO



Service Level Objective

Site Reliability Engineering



“SRE is what happens when you ask a software engineer to design an operations team”

SRE has an intentionally narrowed focus on keeping services and platforms available to customers.

Image source: <https://landing.google.com/sre/books/>

SLA



SERVICE LEVEL AGREEMENT

the agreement you make
with your clients or users

SLOs



SERVICE LEVEL OBJECTIVES

the objectives your team must
hit to meet that agreement

SLIs



SERVICE LEVEL INDICATORS

the real numbers on
your performance

Image source: <https://www.atlassian.com/incident-management/kpis/sla-vs-slo-vs-sli>

SLA

Promise _____

Promise _____

Promise _____

SLOs

Goal _____

Goal _____

Goal _____


SLIs

How did we do? _____

How did we do? _____

How did we do? _____

Image source: <https://www.atlassian.com/incident-management/kpis/sla-vs-slo-vs-sli>


	 Product & Eng	 Operations	 Business
Focus	Prioritizing & Building Functionality	Minimizing Business Risk	Protecting Customer Experience and \$\$\$
Metrics	Feature Velocity CSAT & Churn	Availability, Latency, Throughput, etc.	SLA Adherence Customer Impact
SLO Value	Data-driven way to focus scarce engineering resources	Help dev teams increase velocity without sacrificing quality	Show leading instead of lagging indicators of CX to Board, key stakeholders



Define & Implement SLO



Setting Up SLO

- 
1. List down the Critical User Journeys (CUJ) of services
 2. Construct the SLIs
 3. Determine the SLOs



List Down the CUJs



A few example:

- Show home page of web application
- User sign in through mobile application
- User add to cart an item with multiple quantity
- User can see their transaction history in the last 90 days



Constructing SLIs



- **Availability:** How much uptime does your services have?
 - Measured in 9s (99%, 99,9%, 99,99%, etc.)
- **Performance:** How responsive is you services?
 - Traffic
 - Error rate
 - Latency
 - etc.
- **Durability:** How resilient is your services to data loss?
 - Measured in 9s (99%, 99,9%, 99,99%, etc.)



Determining SLOs

- Make it measurable– such as 100 ms. latency
- Allow some space (error budget) such as 100 ms. 99.9% of the time - 100% is a wrong target.
- Be clear on what you promise, for example 99.9% of the time (averaged over 10 minutes), HTTP calls are completed under 100 ms.
- Consider product and business implications because setting the right objectives for SLOs aren't purely technical.



An Example



CJU:

User sign in through mobile application

SLO:

99,99% availability

100 ms. latency, 99% of the time

SLI:

Availability measured by *response_code* HTTP response from LB

Latency measured by *response_time* HTTP response from LB



Operationalize SLO



Operationalize SLO




- Having a weekly/ bi-weekly operational meeting with cross-functional team to review SLOs.
- Capturing commentary and discussion around SLO violations or trends.
- Tracking follow-up action items from SLO violations
- Reporting on SLOs to the management/ product team to validate prioritization of engineering investment.

Advance SLO Practices



Advance SLO Practices

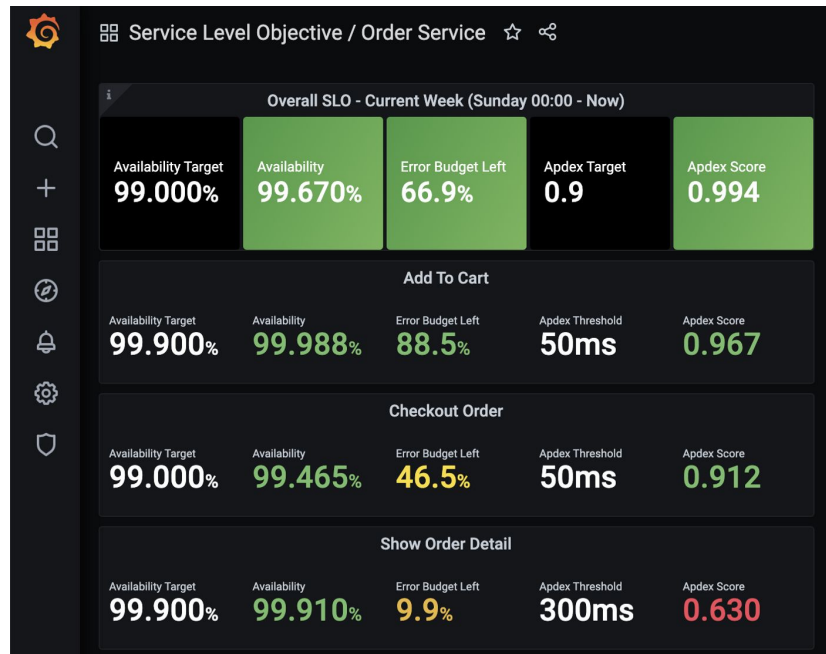
- 
- Alerting on Error Budget
 - Create a composite SLO
 - Treating SLO violations as incidents
 - Correlating changes to SLO



SLO at HappyFresh

SLO Implementation at HappyFresh

- *Event-based* calculation instead of *time-based* calculation.
- Using Apdex to measure performance.
- 7-days time window SLO



SLO Operation at HappyFresh



- Having SLO compliance dashboard for every service.
- Held bi-weekly SLO review meeting with Tech Leads

More on:

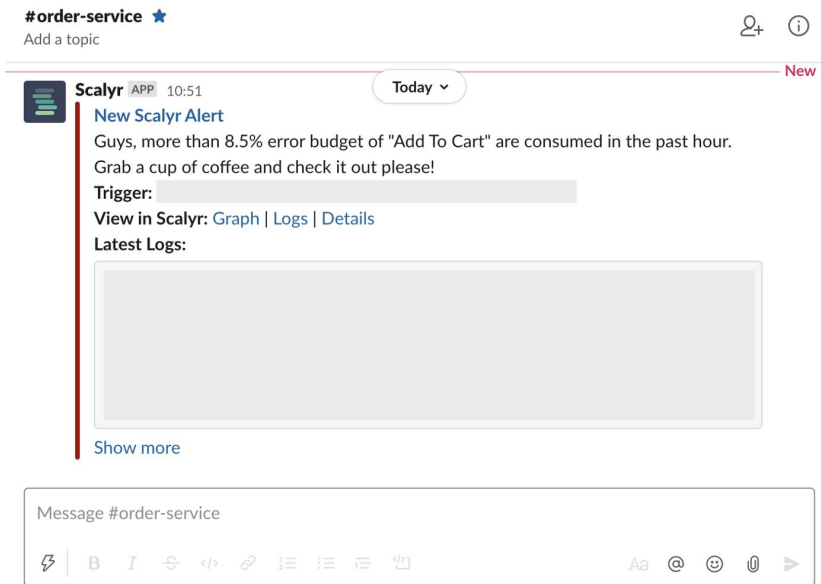
<https://medium.com/happytech/how-happyfresh-implements-slo-slo-series-part-1-f8f56a0b56a7>

Advance Practices at HappyFresh

- Alerting the Error Budget consumption to Slack
- Utilize composite SLO

More on:

<https://medium.com/happytech/alerting-on-error-budget-slo-series-part-2-f5c41e335148>



The screenshot shows a Slack interface for the channel **#order-service**. A message from **Scalyr** (labeled as an application) is displayed. The message content is: "Guys, more than 8.5% error budget of 'Add To Cart' are consumed in the past hour. Grab a cup of coffee and check it out please!". Below the text, there are links for "Trigger:", "View in Scalyr: Graph | Logs | Details", and "Latest Logs:". A large grey rectangular area represents the logs, with a "Show more" link below it. At the bottom of the screenshot is a Slack message input field with a placeholder "Message #order-service" and various formatting icons.

A decorative graphic on the left side of the slide, consisting of a vertical double-headed arrow and a hexagonal shape at the top left corner.

Let's discuss!

Thank You

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