



Starting the SLOs Implementation

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The Problems

1. Third Party or your business partner said that their service that you used will downtime “for a while”
2. Your product team had a debate if the new deployed service was “stable” or not
3. There is confusion on “down” definition between your operation team and product or engineering team



SLO is coming to help
you!



So, what is the SLO ?

A target value or range of values for a service level that is measured by an SLI. (<https://sre.google/sre-book/service-level-objectives/>)



Start with the SLI

a carefully defined quantitative measure of some aspect of the level of service that is provided.

(<https://sre.google/sre-book/service-level-objectives/>)

on my words is

“ The Metrics that you want to observe “



Then the SLO is

on my words is

“ The Target Value or Range values from your Metrics that you want to observe “



But, I dont know what
metrics should I
observed for now



Four Golden Signals

1. Latency

The time it takes to service a request

2. Traffic

A measure of how much demand is being placed on your system

3. Errors

The rate of requests that fail, either explicitly (e.g., HTTP 500s), implicitly (for example, an HTTP 200 success response, but coupled with the wrong content), or any “error” or unexpected result

4. Saturation

How “full” your service is. A measure of your system fraction, emphasizing the resources that are most constrained (e.g., in a memory-constrained system, show memory; in an I/O-constrained system, show I/O). Note that many systems degrade in performance before they achieve 100% utilization, so having a utilization target is essential.

Start create the SLI

1. SLI Specification

- a. The definition about what you want to observe
- b. Usually its a form of percentile or percentage between some events and total events

2. SLI Implementation

- a. Where you can get the metrics
- b. How can you get the metrics
- c. The generic formula to create it is

SLI = good or target events / total events * 100%



SLI Examples

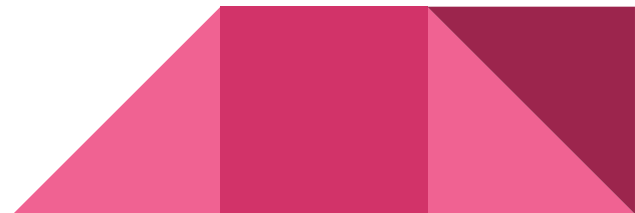
1. SLI Specification

- a. I want to measure http response that return non-error response (2xx or 3xx) to client

2. SLI Implementation

- a. Query from API Gateway metrics
- b. Query from Service Mesh
- c. Query from WAF or Cloud Proxy Services

$$\text{SLI} = (2\text{xx response} + 3\text{xx response}) / \text{total requests} * 100\%$$



Choose Time Window

1. Evaluate / Aggregation Time Window

- a. Time window for aggregate every point or event

2. SLO Time Window

- a. Time window where you want to define and limit your SLO



Set the Boundaries

1. **Try to visualize it**
2. **Find the Average movement of your SLI**
3. **Put the boundaries below the minimum point / average movement**
 - a. If you put the boundaries on top of your average movement, then by default your system was breaching the SLO
 - b. Its usually start from 90%
 - i. 90%
 - ii. 95%
 - iii. 99%
 - iv. 99.5%
 - v. ...
 - c. You can increase your SLO after your normal circumstances is also going up



For Examples

Specification

- http that return non-error response for every 5 minutes



1. 5 minutes metrics aggregation time (1 dotted metrics)
2. 30 days SLO time
3. 95% of SLO

How did we know that our service breach the SLO ?

if

$\text{sum of (metrics below SLO)} > (1-\text{SLO}) \times \text{SLOtw} / \text{Atw}$

$\text{SLOtw} = \text{SLO time window}$

$\text{mat} = \text{aggregation time window}$

then we breach the SLO

Based on our Examples

We have

1. 5 minutes metrics aggregation time (1 dotted metrics)
2. 30 days SLO time
3. 95% of SLO

you have an allowed error response within $(1-95\%) \times 30 \text{ days} = 36 \text{ hours}$

because you have a 5 minutes aggregation metrics then you have = $36 \text{ hours} / 5 \text{ minutes of allowed}$
under 95% 5 metrics (1 dotted metrics) which is 432.

so, if your 5 minutes metrics (1 dotted metrics) is below 95% tends to **appear greater than 432**
times within 30 days, than you breach your 30 days SLO.

But This problem can be
understood better when
we introduce the Error
Budget



Recap

1. Build SLI specification
 - a. If you still not sure about what to be measured, see the Four Golden Signals
2. Build SLI Implementation
 - a. Where and how you can get the metrics
 - b. How can you visualize the metrics
3. Visualize your SLI
4. Set the time window
 - a. Metrics Aggregation Time Window
 - b. SLO Time Window
5. See the average movement of your SLI
6. Set boundaries below the average movement of your SLI
7. your boundaries is your first SLO, congrats! You have the SLO now



~~The Problems.~~ The Solutions

1. ~~Third Party or your partner said that their service will downtime “for a while”~~ for 5 minutes
2. ~~Your product team had a debate if the new deployed service was “stable” or not.~~ Its okay for error, as long as the SLI metrics still on top of SLO
3. ~~There is confusion on “down” definition between your operation team and product or engineering team.~~ Its okay for returning unexpected result, as long as the SLI still on top of SLO



Next Topics

1. Error Budgets & Error Policy
2. Calculating SLO for Integrated Services
3. Alerting on SLOs
4. Why Canary Release can improve your SLOs while maintaining agility

<https://medium.com/@abbdurahman>



Thanks,
See you!

