



Intro to Redis Streams

IMCSUMMIT - NOVEMBER 2019 | DAVE NIELSEN

AGENDA



- What is a data stream?
- What are the typical challenges you face while managing data streams?
- What is Redis Stream?
- How Redis Stream addresses the challenges?
- How to use Redis Streams?

Who We Are



Open source. The leading **in-memory database platform**, supporting any high performance operational, analytics or hybrid use case.



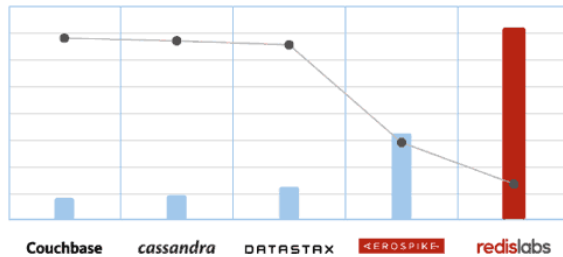
The open source home and commercial provider of **Redis Enterprise** technology, platform, products & services.

Redis Top Differentiators

1

Performance

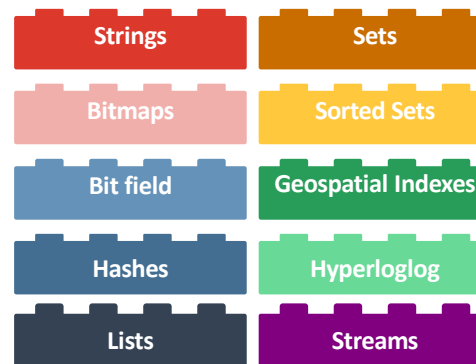
NoSQL Benchmark



2

Simplicity

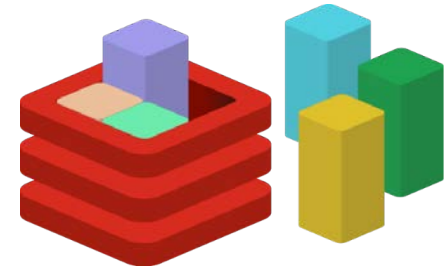
Redis Data Structures



3

Extensibility

Redis Modules

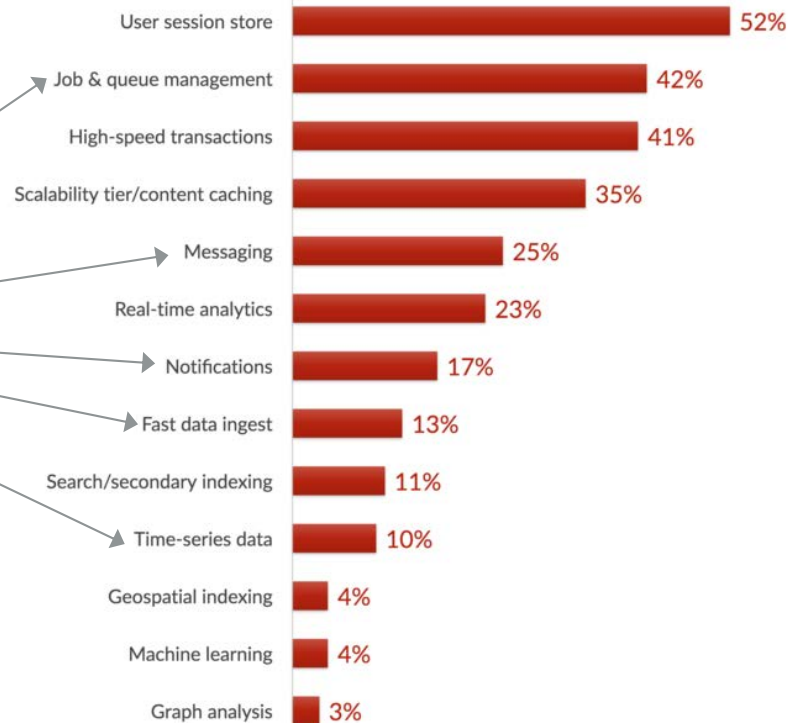


Data Stream Use Cases

REDIS ENTERPRISE CUSTOMER RESEARCH

Top Redis Enterprise Use Cases

What are your Redis Enterprise use cases?



Source: TechValidate survey of 416 users of Redis Enterprise



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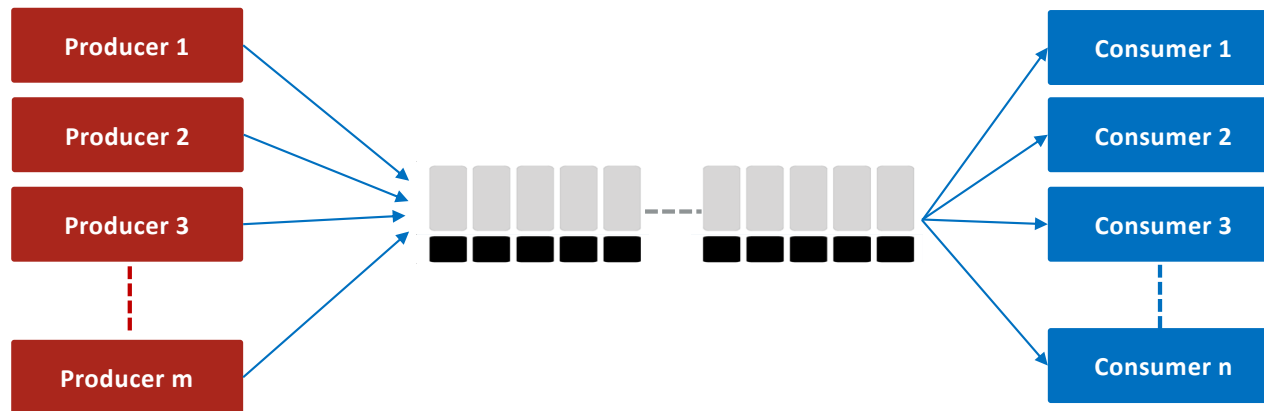
What is a Data Stream?



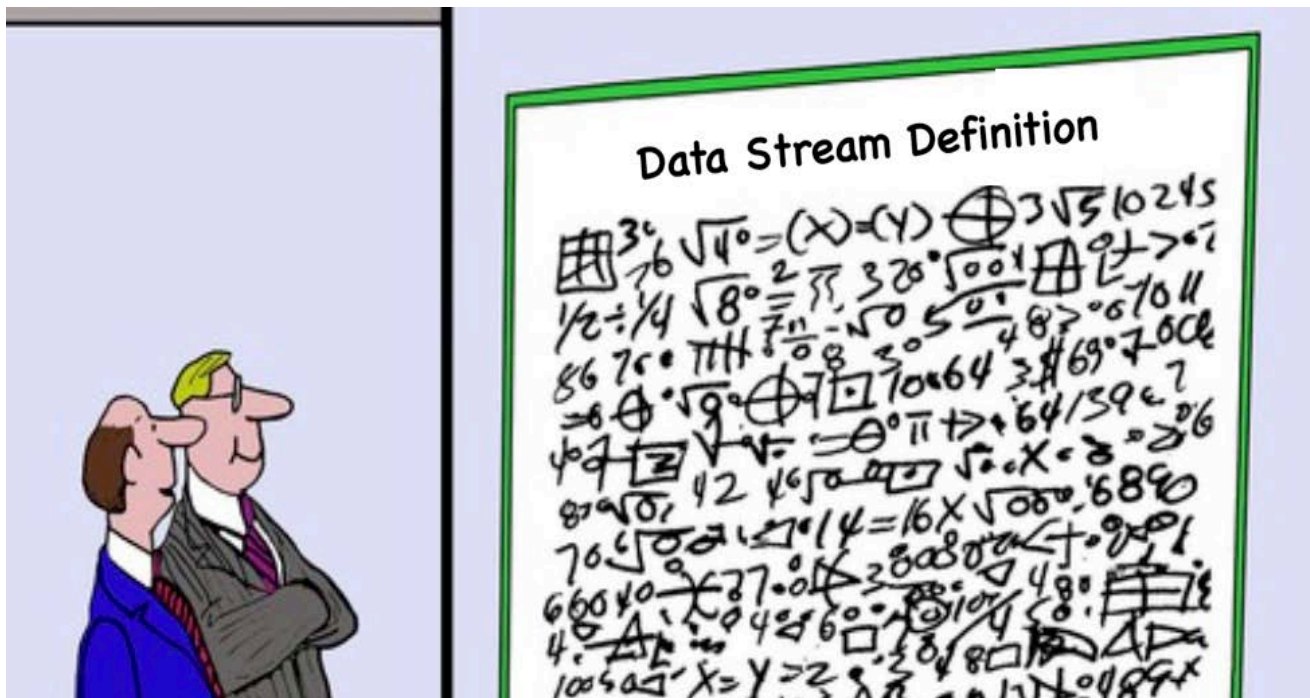
Simplest form of a Data Stream



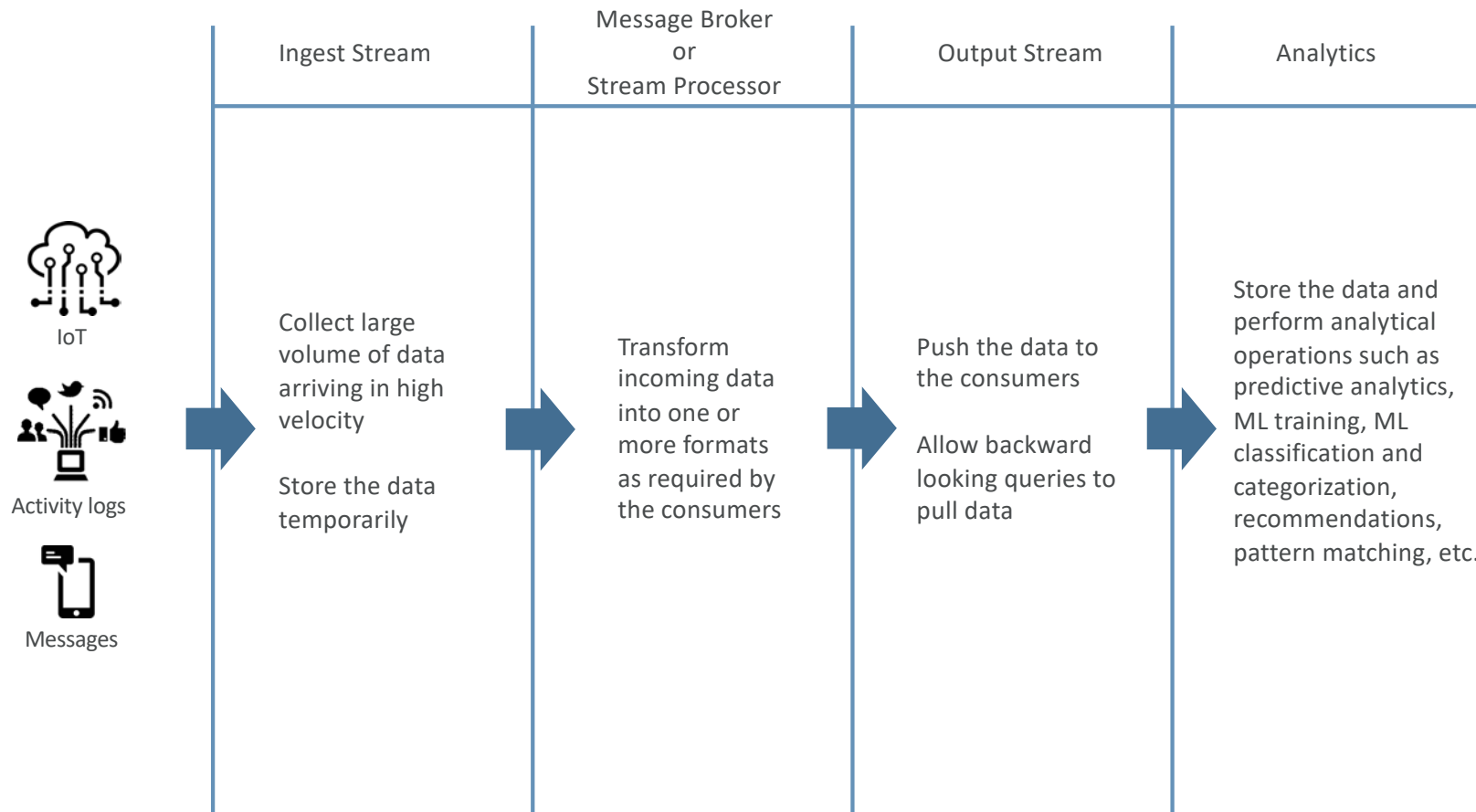
But Often You Have M Producers and N Consumers



It's a bit more complex than that



Data Stream Components





Redis Supports All the Functions of a Data Stream

Ingest Stream	Message Broker or Stream Processor	Output Stream	Analytics
Redis			
<ul style="list-style-type: none">• Streams• Pub/Sub• Lists	<ul style="list-style-type: none">• Streams• Pub/Sub• Lists	<ul style="list-style-type: none">• Streams• Sorted Sets• +• Spark Connector• ODBC/JDBC Connector	<ul style="list-style-type: none">• Sorted Sets• Sets• Geo• Bitfield• +• RedisGraph• RediSearch

Redis Streams Demo

localhost:3000/producer

Twitter Ingest Stream

Steam size: 104956

Make person tell Valverde say Wilian still dey market.

People are so defensive out here. You can't say anything without a person almost coming at you with a knife or some... <https://t.co/jwFg7H4oRd>

03:41 en Quinta Normal 10-2-1 B4 San Pablo y Ernesto Samitt <https://t.co/zpeOVA8Ozq>

@paugener_58 @FansLauraBorras Gracia

Nakakatamad pumasok geez

@Slipmaggot8 Now that's some factual bullshit

Are you on your ass to work?

@RenAidi_16 @Elviatuzz2 @RudyRoedyanto @netmediatama tolong siarin BWF world tour final dong

I'm really not sure how im supposed to recover and move on from this. I feel like another chapter of my life is jus... <https://t.co/3sEBGTMpLc>

Dame un beso y decime chau que si lo pienso dos tres veces me arrepiento así soy yo!!!!

03:41 en Quinta Normal 10-2-1 B4 San Pablo y Ernesto Samitt <https://t.co/Y4y75cSuMp>

@GoldFin82615441 ありがとうございます。顔録のタカハシ 松本店で、11月30日〜12月4日までです。急な用事が無い限り在席しています。どうぞご高覧下さい🙏

@BiggBoss848 @TheKbri @manupunjabim3 <https://t.co/4YDjSqB1Oy>

@gohanda0630 私も 久しぶりに 布団で 昼寝👌👌 しました👌

Tukijitaa nani atabaki sasa? au ulimanisha tujitolee kama tunavyojitolea hela yetu ya pension na export levy ya cal... <https://t.co/m3C6XH3elh>

@un_chinois_noir @_terezuss Mddddd ele est pas prête

No se puede confiar en alguien que se llame Doby y use mechas en plano 2018.

@ArvindKejriwal AAP AAP hai ,hum hum hai ,kuch samje hum mey aur AAP mey kya farak hai .👌

There's a guy works down the White House swears he's Elvis, but he's a liar....

@Mahmoud59753309 ...الوده يا استاذ محمود الله اكبر علينا الانجليز ي مولع التوكه اهم حاجه اليه الحلوه وحب الخير لن <https://t.co/WyTLvF3RW>

Redis Streams Demo

localhost:3000/influencer

Influencer Catalog

Influencers: 2289

New Influencers

Zezo_rmd| Followers:32183

WinkWestwood| Followers:11337

PoojaOnTV| Followers:18090

TerranGregory| Followers:26799

Radio_Emergency| Followers:44188

AlvaroMolinaCL| Followers:15767

melbardisi1| Followers:26305

melbardisi1| Followers:26305

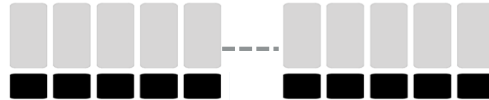
ladivaza| Followers:2298390

CTDOT_Statewide| Followers:10399

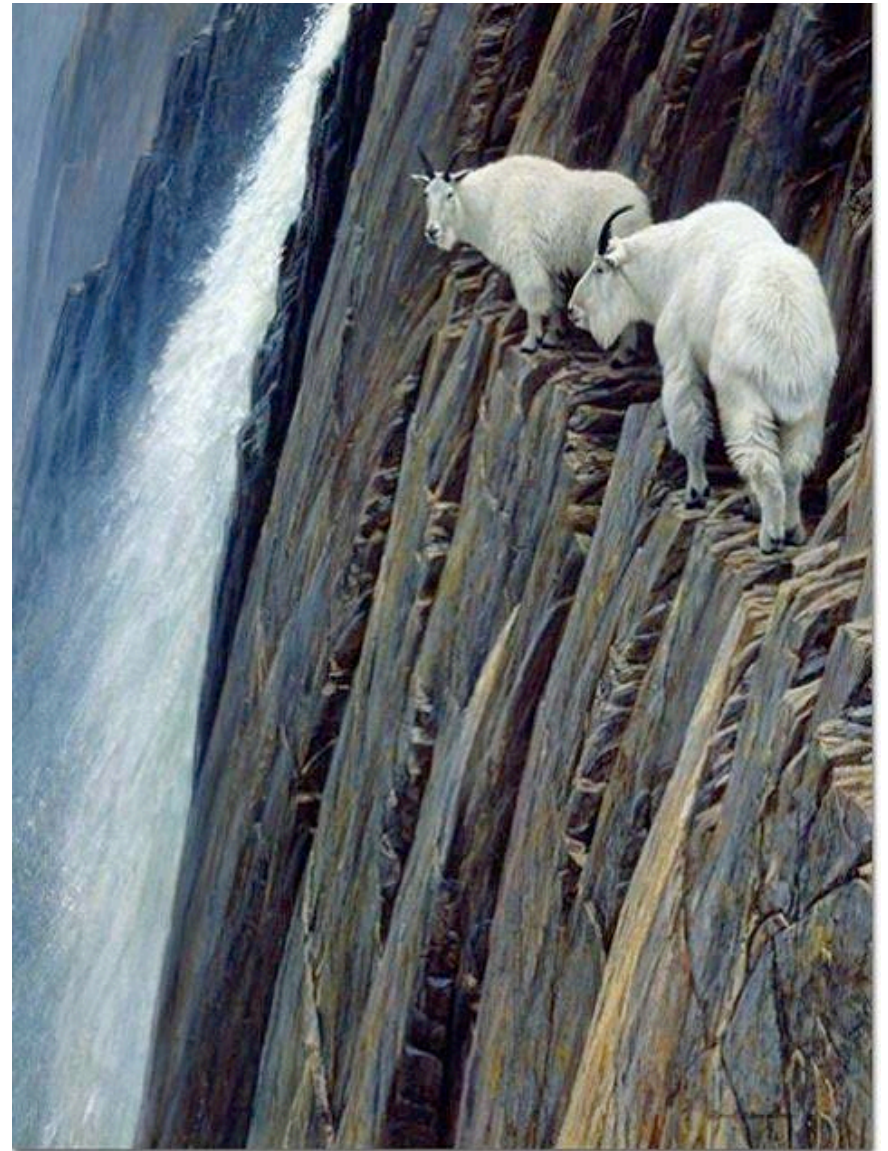
Top Influencers

Handle	# Followers
Lakers	7461113
FaZeClan	3469368
biobio	2802204
Alex10	2679175

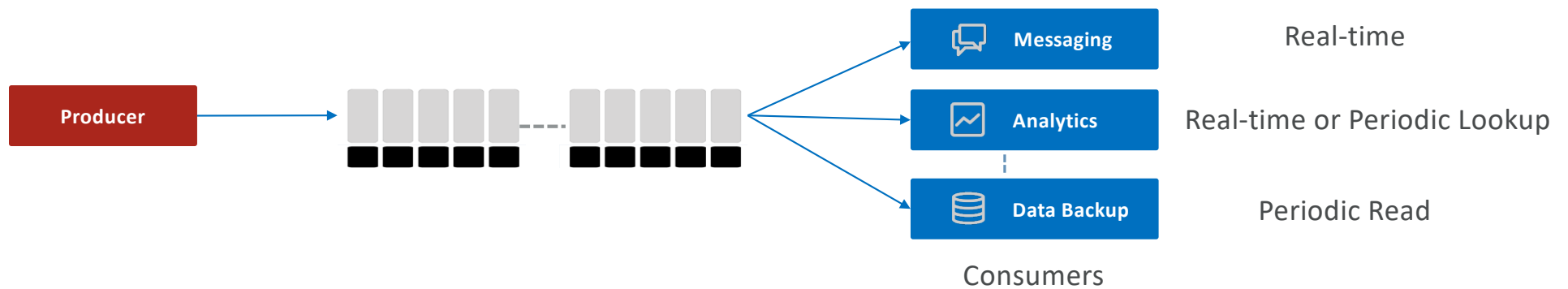
Understanding Redis Streams



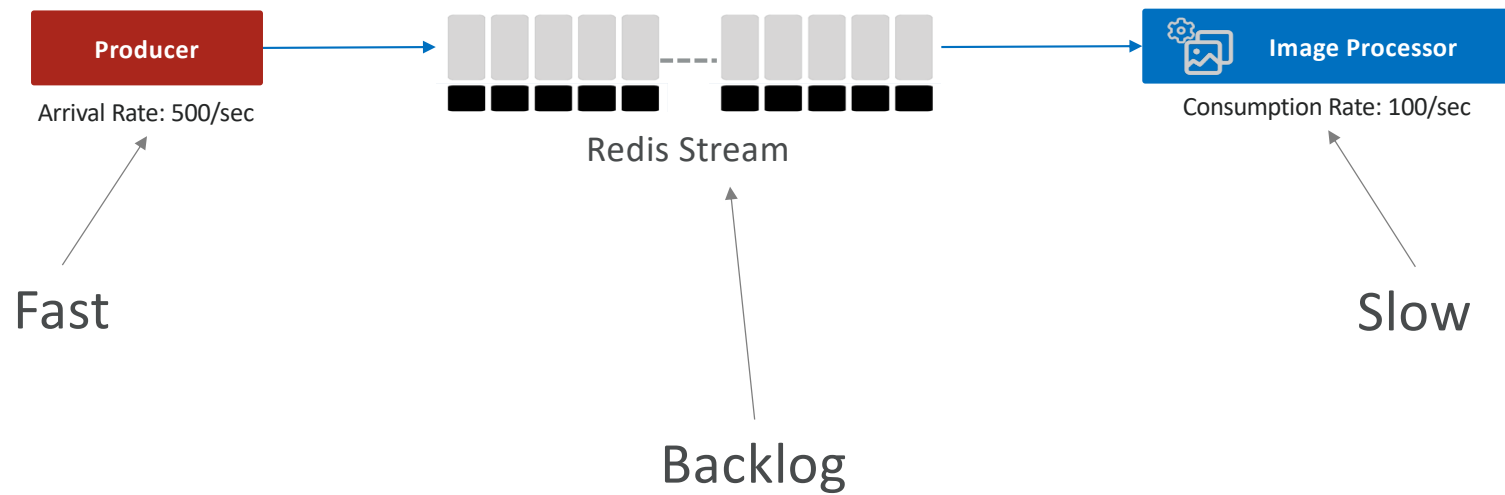
Let's look at the
challenges first



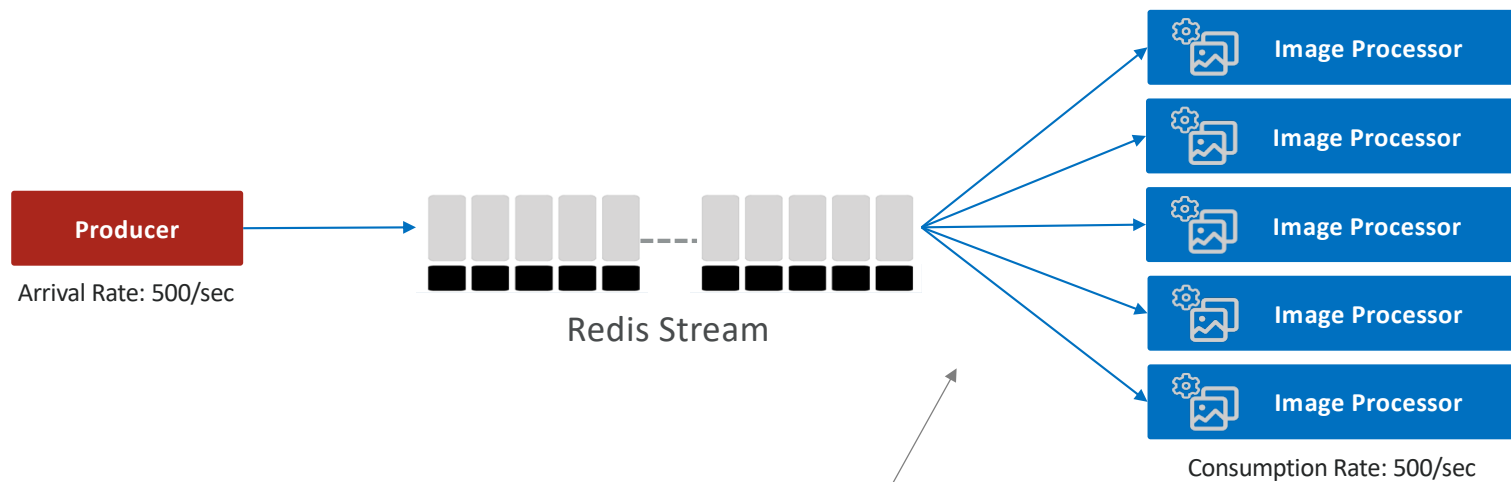
How to Support a Variety of Consumers



The Catch Up Problem



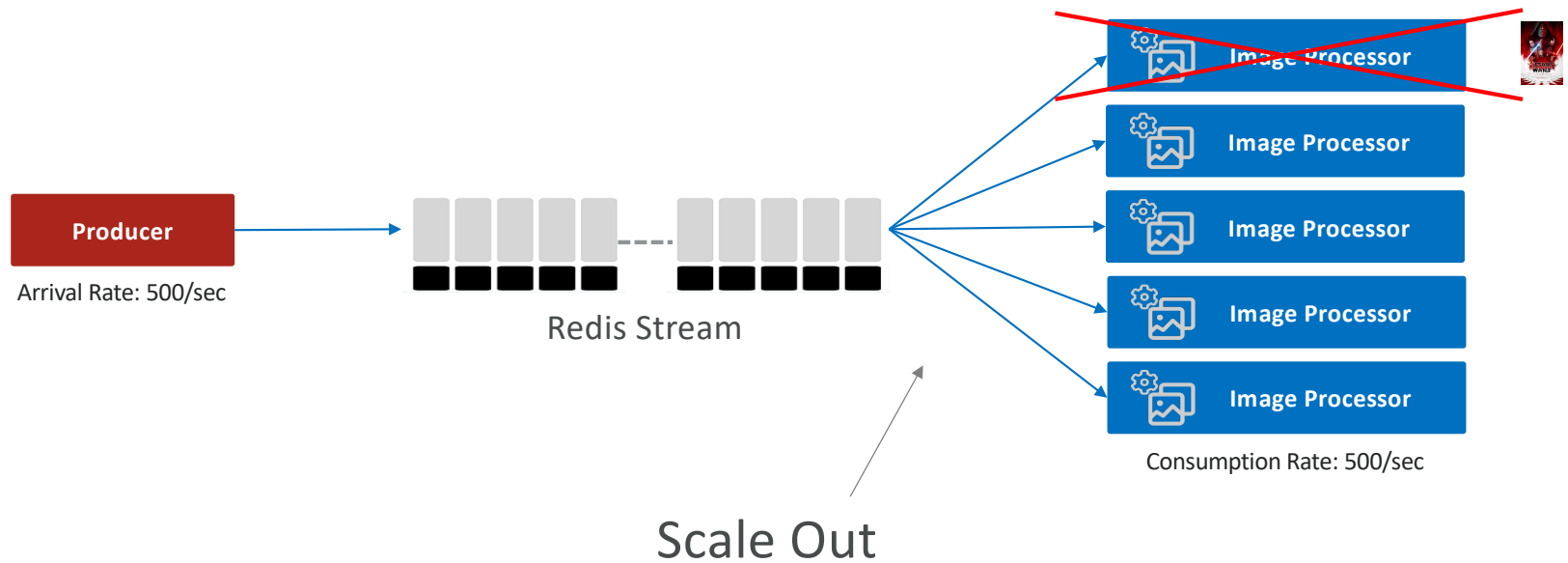
How to Address The Catch Up Problem?



Scale Out

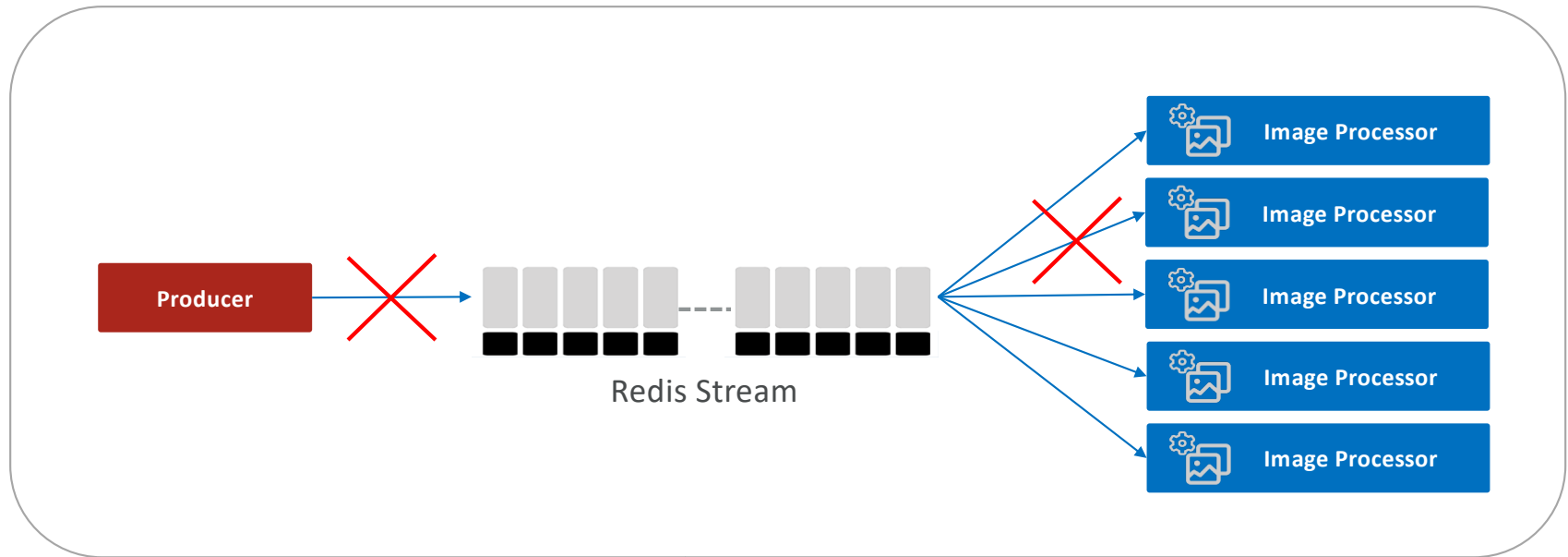
New Problem: Mutual Exclusivity

Data Recovery from Consumer Failures



Yet Another Problem: Failure Scenarios

Connection Failures

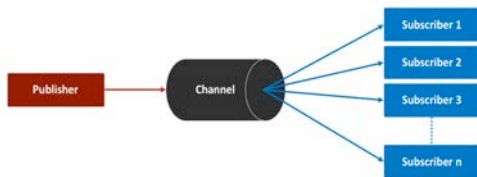


The solution must be resilient to failures

Here comes Redis Streams

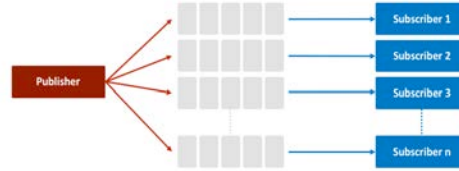


What is Redis Streams?



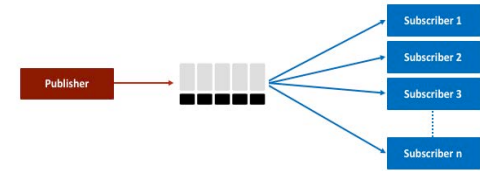
Pub/Sub

It is like Pub/Sub, but with persistence



Lists

It is like Lists, but decouples producers and consumers



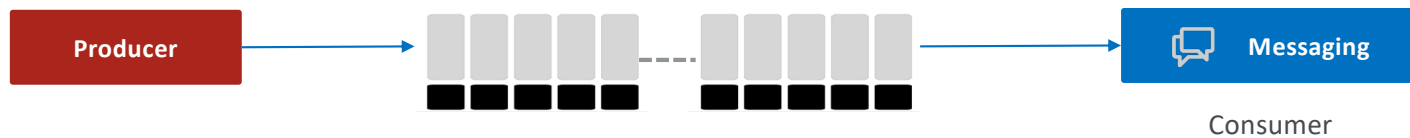
Sorted Sets

It is like Sorted Sets, but asynchronous

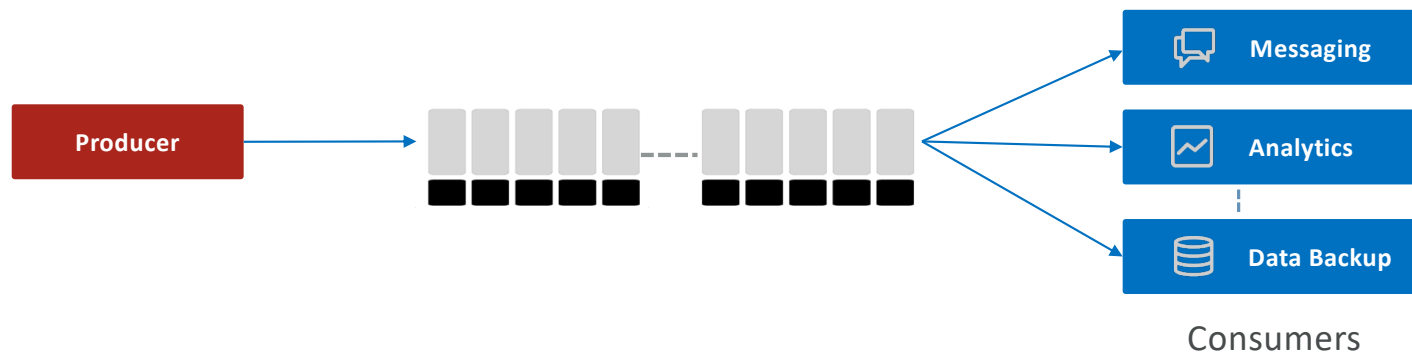
+

- Lifecycle management of streaming data
- Built-in support for timeseries data
- A rich choice of options to the consumers to read streaming and static data
- Super fast lookback queries powered by radix trees
- Automatic eviction of data based on the upper limit

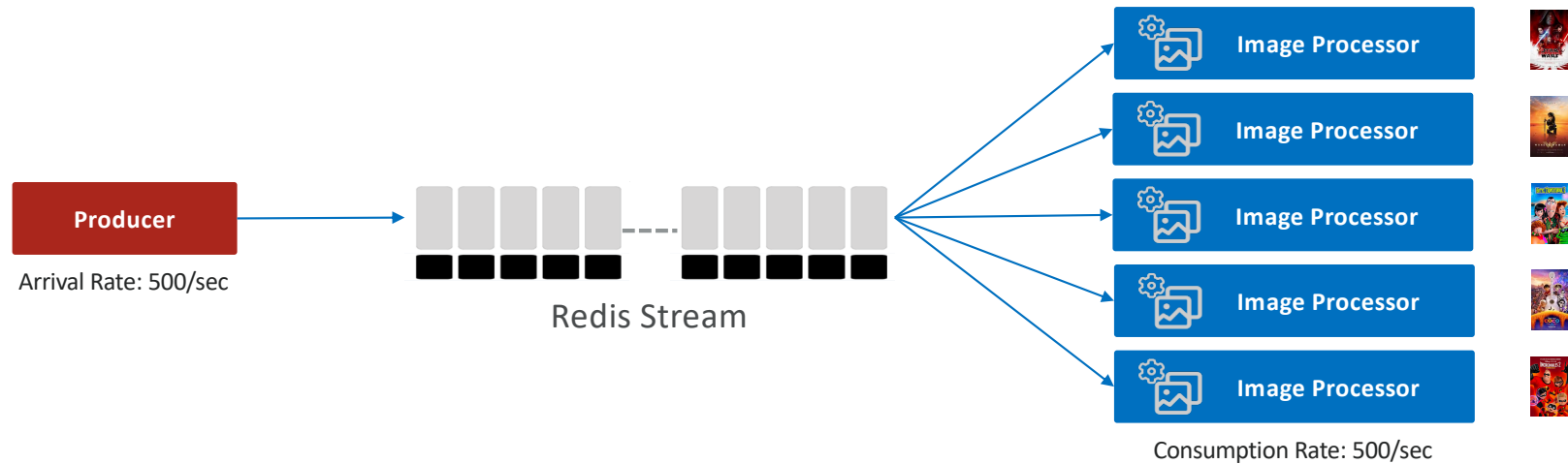
1. It enables asynchronous data exchange between producers and consumers



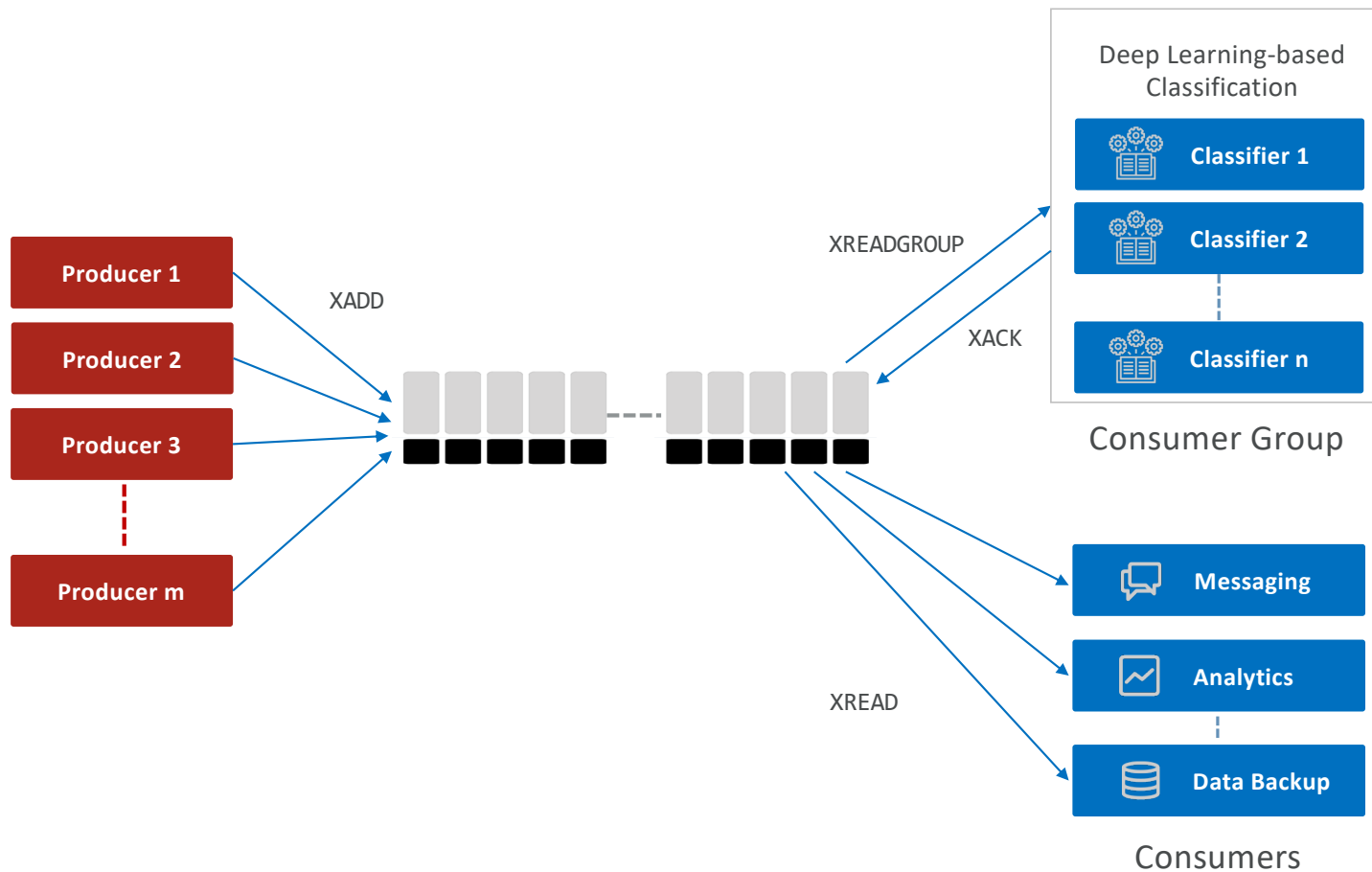
2. You can consume data in real-time as it arrives or lookup historical data



3. With consumer groups, you can scale out and avoid backlogs



4. Simplify data collection, processing and distribution to support complex scenarios



Redis Streams Commands

XINFO [CONSUMERS key groupname]...
Get information on streams and consumer groups

XADD key ID field string [field...]
Appends a new entry to a stream

XTRIM key MAXLEN [~] count
Trims the stream to (approximately if '~' is passed) a certain size

XDEL key ID [ID ...]
Removes the specified entries from the stream. Returns the number of items actually deleted, that may be different from the number of IDs passed in case certain IDs do not exist

XRANGE key start end [COUNT count]
Return a range of elements in a stream, with IDs matching the specified IDs interval

XREVRANGE key end start [COUNT count]
Return a range of elements in a stream, with IDs matching the specified IDs interval, in reverse order (from greater to smaller IDs) compared to XRANGE

XLEN key
Return the number of entries in a stream

XREAD [COUNT count] [BLOCK mill...]
Return never seen elements in multiple streams, with IDs greater than the ones reported by the caller for each stream. Can block.

XGROUP [CREATE key groupname id...]
Create, destroy, and manage consumer groups.

XREADGROUP GROUP group consume...
Return new entries from a stream using a consumer group, or access the history of the pending entries for a given consumer. Can block.

XACK key group ID [ID ...]
Marks a pending message as correctly processed, effectively removing it from the pending entries list of the consumer group. Return value of the command is the number of messages

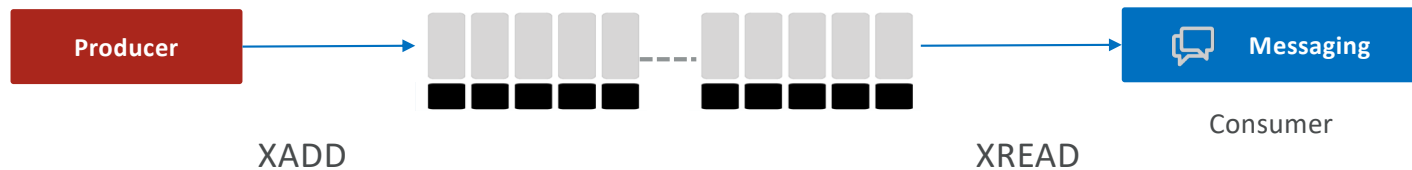
XCLAIM key group consumer min-i...
Changes (or acquires) ownership of a message in a consumer group, as if the message was delivered to the specified consumer.

Quick Reference Guide

<https://redislabs.com/docs/getting-started-redis-streams/>

Commands: XADD, XREAD

Asynchronous producer-consumer message transfer

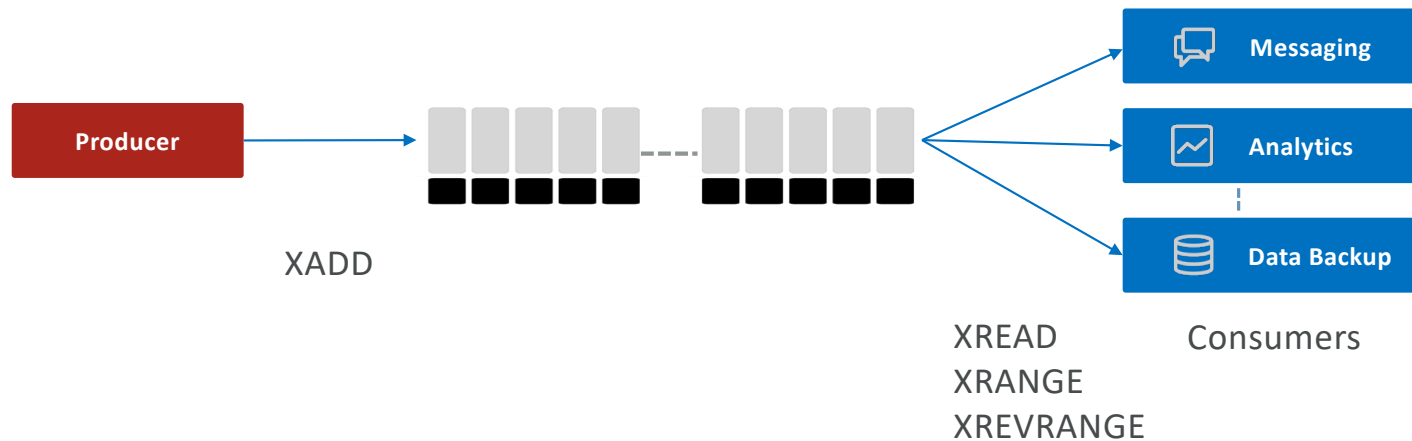


```
XADD mystream * name Anna  
XADD mystream * name Bert  
XADD mystream * name Cathy
```

```
XREAD COUNT 100 STREAMS mystream 0  
XREAD BLOCK 10000 STREAMS mystream $
```

Commands: XRANGE, XREVRANGE

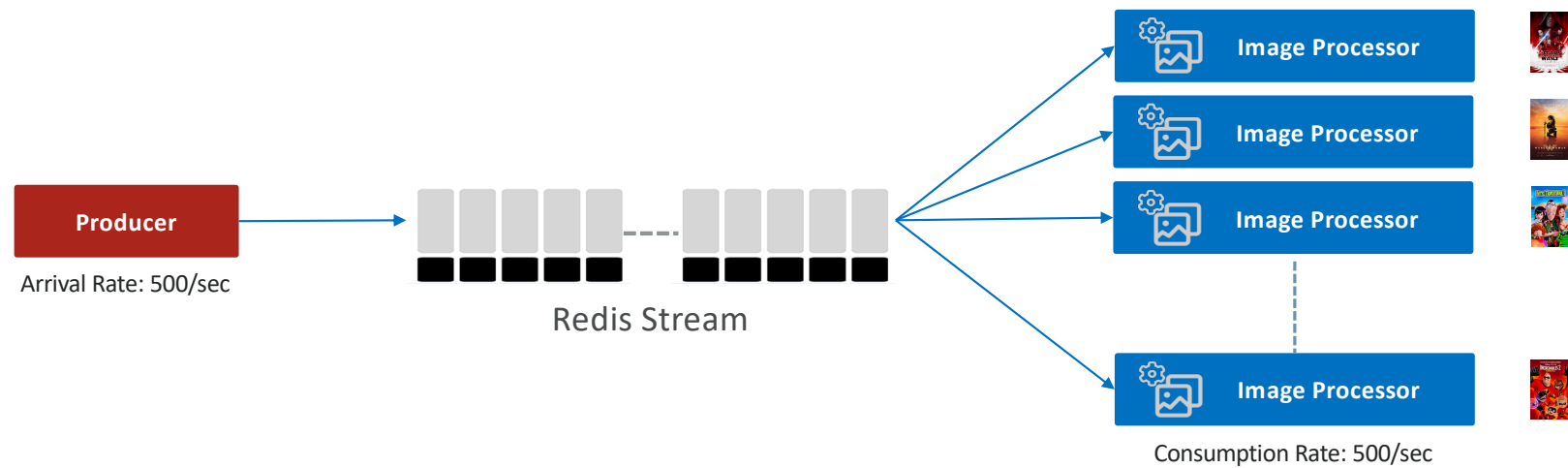
Lookup historical data



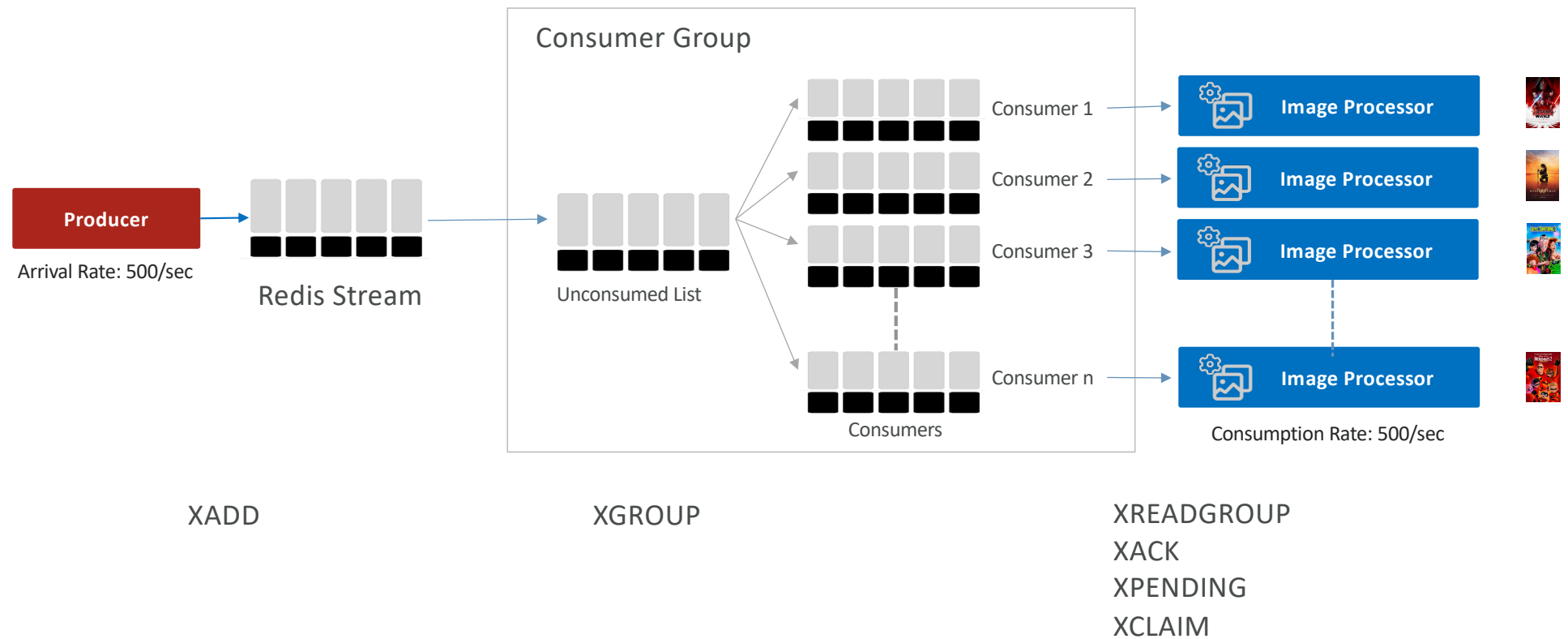
```
XRANGE mystream 1518951123450-0 1518951123460-0 COUNT 10
```

```
XRANGE mystream - + COUNT 10
```

Scaling out using consumer groups

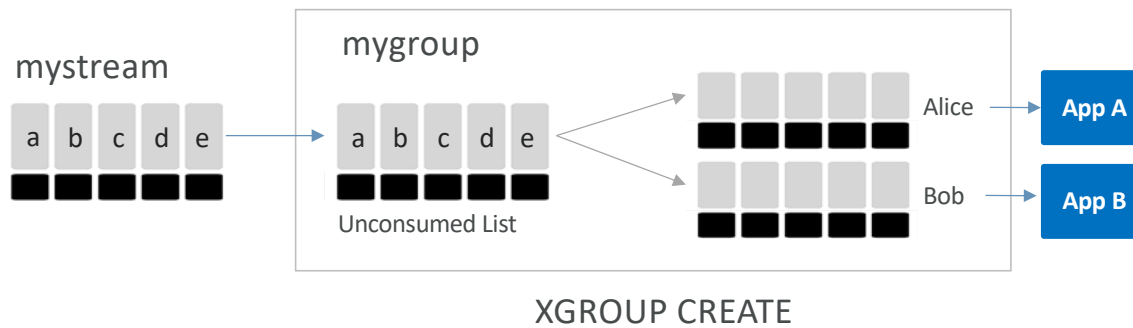


Scaling out using consumer groups



Command: XGROUP CREATE

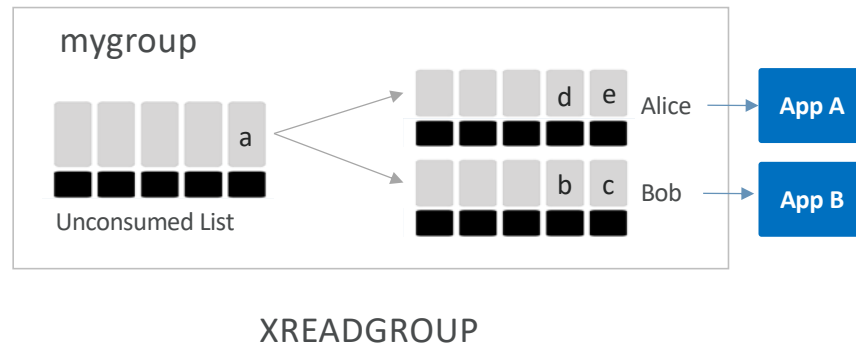
Create a consumer group



```
XGROUP CREATE mystream mygroup $ MKSTREAM
```


Command: XREADGROUP

Read the data

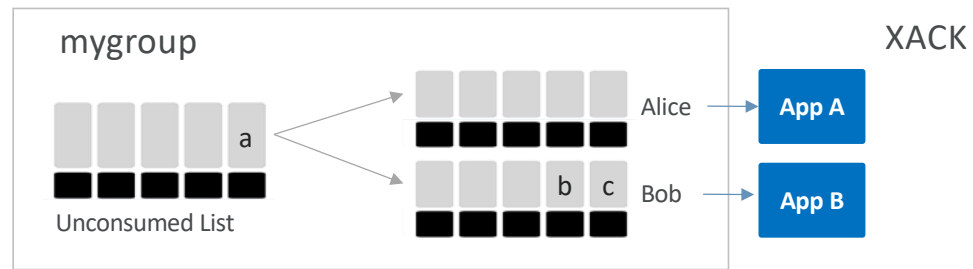


```
XREADGROUP GROUP mygroup COUNT 2 Alice STREAMS mystream >
```

```
XREADGROUP GROUP mygroup COUNT 2 Bob STREAMS mystream >
```

Command: XACK

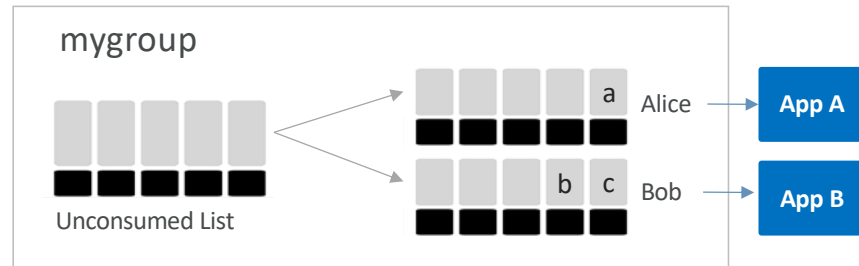
Consumers acknowledge that they consumed the data



```
XACK mystream mygroup 1526569411111-0 1526569411112-0
```

Command: XREADGROUP

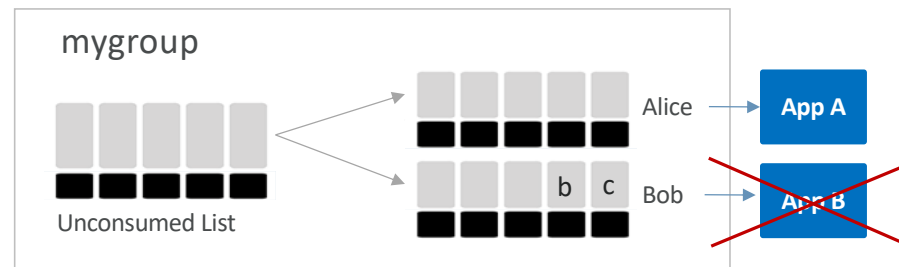
Repeat the cycle



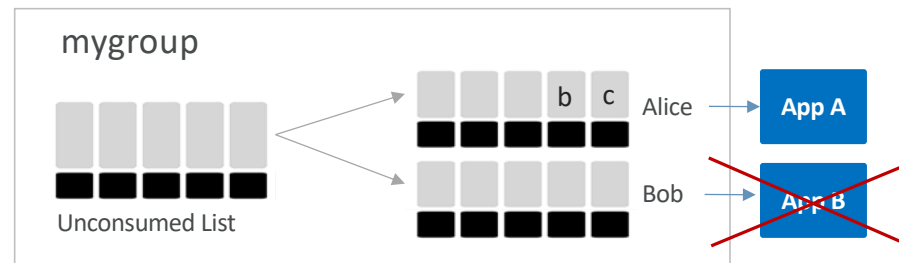
XREADGROUP

```
XREADGROUP GROUP mygroup COUNT 2 Alice STREAMS mystream >
```

How to claim the data from a consumer that failed while processing the data?

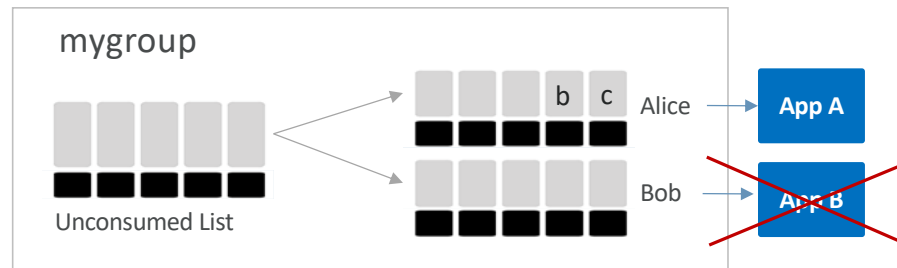


XCLAIM



Commands: XPENDING, XCLAIM

Claim pending data from other consumers



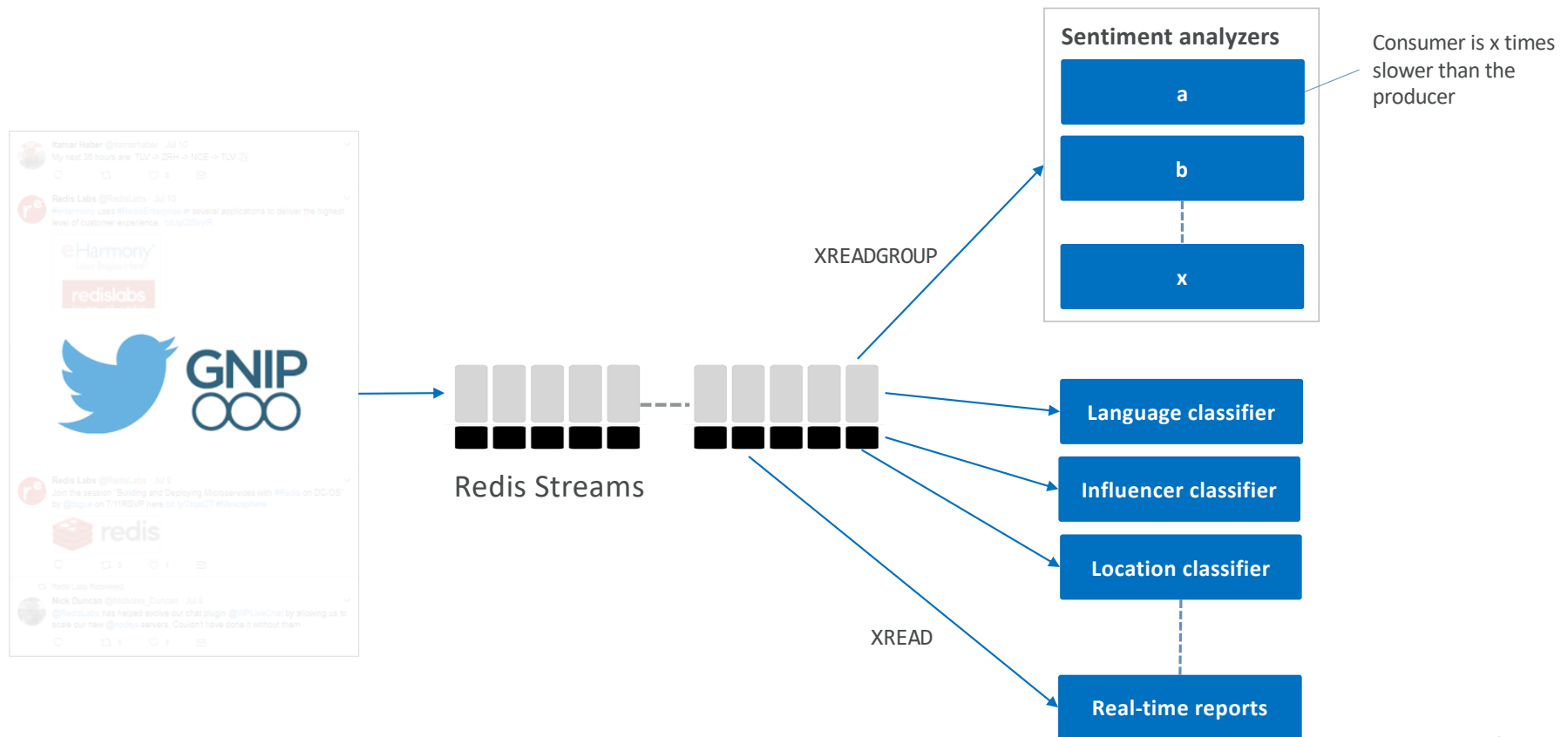
```
XPENDING mystream mygroup - + 10 Bob
```

```
XCLAIM mystream mygroup Alice 0 1526569411113-0 1526569411114-0
```

Now is the time to



Sample Use Case: Social Media Analytics



Demo

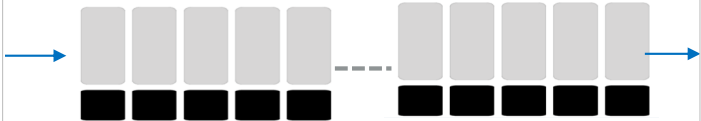
Twitter Ingest Stream

Twitter Ingest Stream

Stream size: 74930

20 years old. Flip me. <https://t.co/807CN0iTY>
@O7q8sgX0K6RVH @pomechanic せひ、お話しください！お待ちしております！
@copastina @ELTEMPO Que paz tan sucha y chochina nos dejó @JuanManSantos pero eso si salió con tulas de billetes
Nasrida guzellz <https://t.co/p0vK6naO1j>
@LunnyDellaGasper Jajaja no me hagas hablar por favor
Nike's on my feet was my shit #MacMiller
Blen extra sensitive lately 🍷 &the only thing that makes me feel better is food... about to gain back all the weigh...
<https://t.co/S20vY0w6K>
Gracias a todos por sus bellas palabras ahora mi madre ya está descansando en paz y con la tranquilidad que todo su...
<https://t.co/W90f0w8m96>
@TheTattooedProf Was Yoshi quoted too?
@CBCCalgary Looks good on ya, Merchant
@RobonM 真顔かをりさん、田中裕也です。嫁54人に、言います。嫁54人、田中裕也、LIVE中継、観てください。
<https://t.co/MS0SD0cu8W>
Ariana and the bad news over the past year. Girl can't get a break.
Essas miks querem acabar c minha vida kkkk
Acabei de ler no Facebook um texto de um homem dizendo que ninguém deve meter a colher nas relações dos outros como...
<https://t.co/fYURP7XPUJ>
Wind 0.0 kts SE. Barometer 1022.0 HPa. Rising slowly. Temperature 14.3 °C. Rain today 0.0 mm. Humidity 84%
@fienoticiand la comunidad del Res. Regina Autopista de San Isidro está en las calles por la burla de @EdeesteRD...
<https://t.co/Rk0l80WZiY>
'Aptaim; çünkü canın ne zaman isterse o zaman geldin ve ben hiçbirine hayır diyemedim.' - Love and Other Drugs
ROS
V Soccer up 3-0 with 6 minutes remaining @Woodberry Forest 🏴
Al final terminamos hablando y deseándonos cosas lindas. Pero no lo tomes a mal. Solo es mi pensar de una persona q...
<https://t.co/MLG74NieuN>





Redis Streams

Influencer Classifier

Influencer Catalog

Influencers: 1634

New Influencers

UnderstandTrap| Followers:22309

fynavy| Followers:59489

horaniezadol| Followers:12695

tomcoates| Followers:37049

philipnolan1| Followers:14963

IncredibleZery| Followers:28584

belinha_inez| Followers:10542

mrcsuperfreq| Followers:11189

marcellomusic| Followers:32748

Kenotrotamundos| Followers:15259

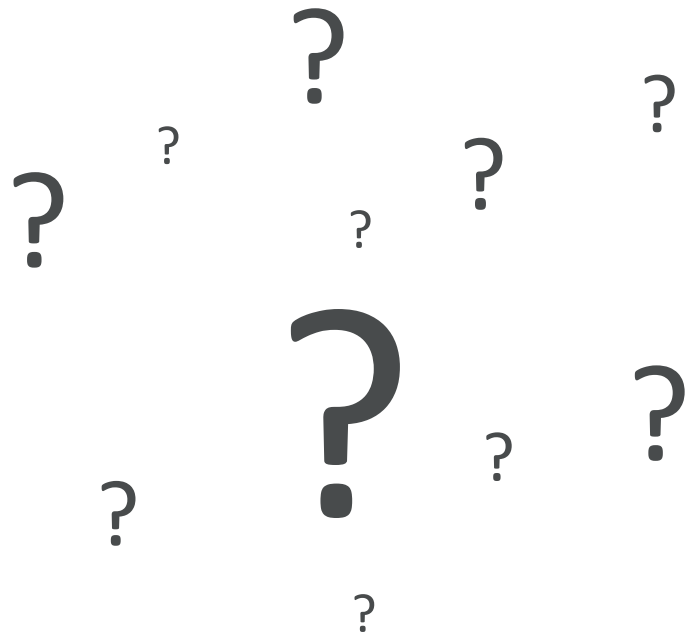
Top Influencers

Handle	# Followers
FaZeCian	3469368
bloblo	2802204
Alex10	2679175
PierreMenes	2432190
BluRadioCo	2222054
MercedesAMGF1	2136209
hialstuff	1941941
THEBEAT999FM	1891005
OVIACDMX	1695952
DJFreshSA	1647356

Redis Clients that Support Redis Streams

Java	Jedis	https://github.com/xetorthio/jedis
	Lettuce	https://lettuce.io/
Python	redis-py	https://github.com/andymccurdy/redis-py
JavaScript	ioredis	https://github.com/luin/ioredis
	node_redis	https://github.com/NodeRedis/node_redis
.NET	StackExchange.Redis	https://github.com/StackExchange/StackExchange.Redis
Go	redigo	https://github.com/gomodule/redigo
	go-redis	https://github.com/go-redis/redis
C	Hiredis	https://github.com/redis/hiredis
PHP	predis	https://github.com/nrk/predis
	phpredis	https://github.com/phpredis/phpredis
Ruby	redis-rb	https://github.com/redis/redis-rb

Questions



Thank you!
redislabs.com

