

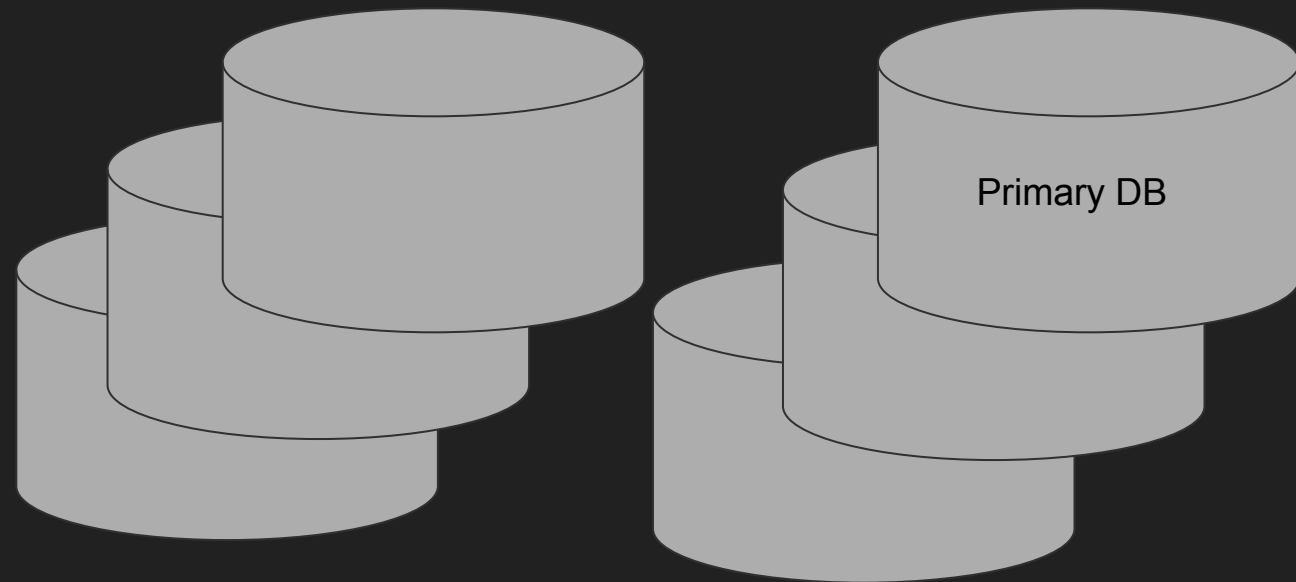
The Great Escape

On Prem to the Cloud with Postgres

With Morgan Howes

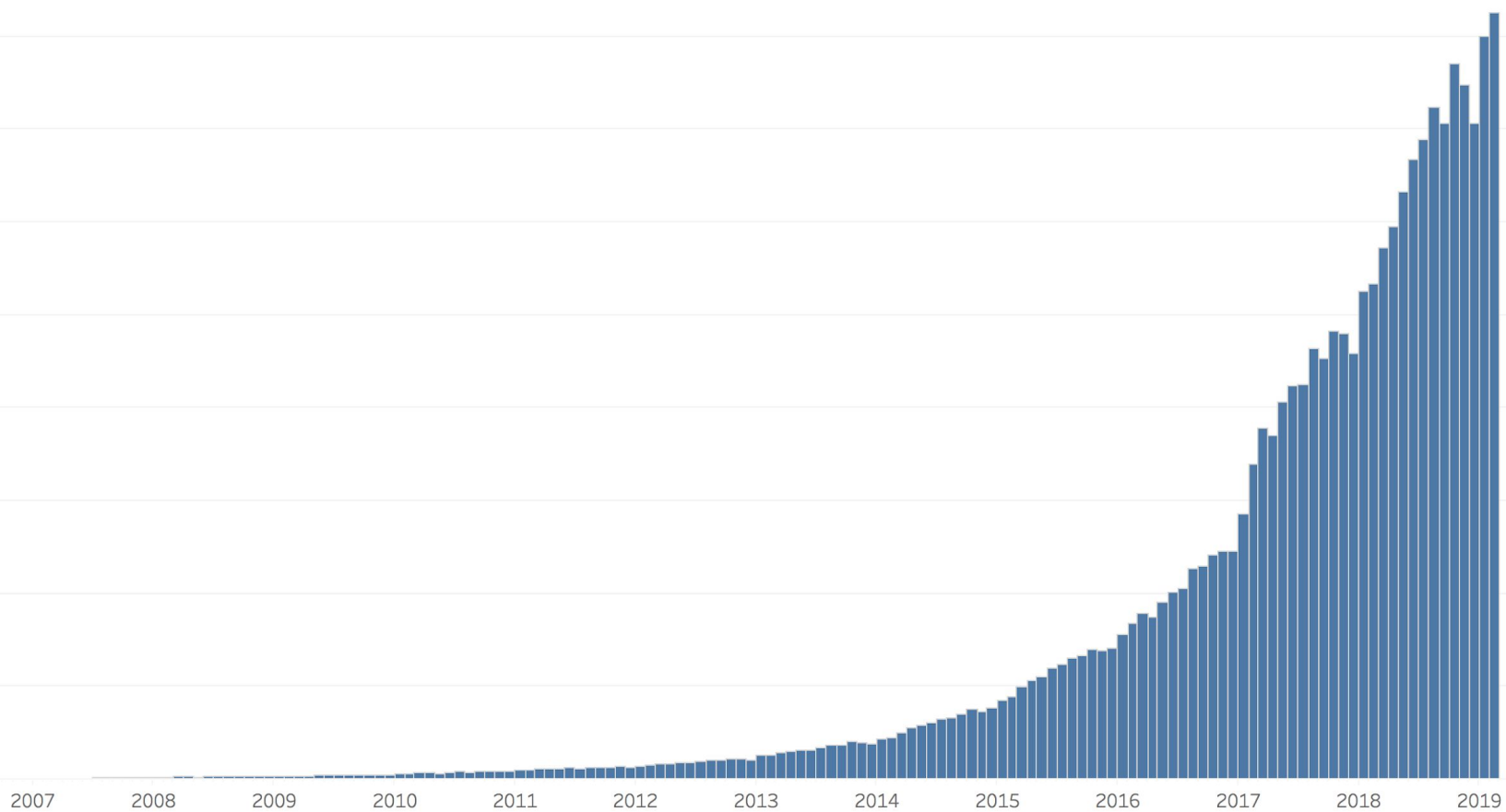
PROCORE[®]





WS	WS	WS
WS	WS	WS
WS	WS	WS
BG	BG	BG
BG	BG	BG
BG	BG	BG

Monthly Active User Trend



Month of Year Month

Server Specs

- 36 CPUs (Physical)
 - Up to 72 with hyperthreading
- 22 SSDs in a RAID10
- 30 TB of Storage
- 1.5 TB of Ram
- 14 TB of Data

So Why Move?

Where to go?





PostgreSQL

aws



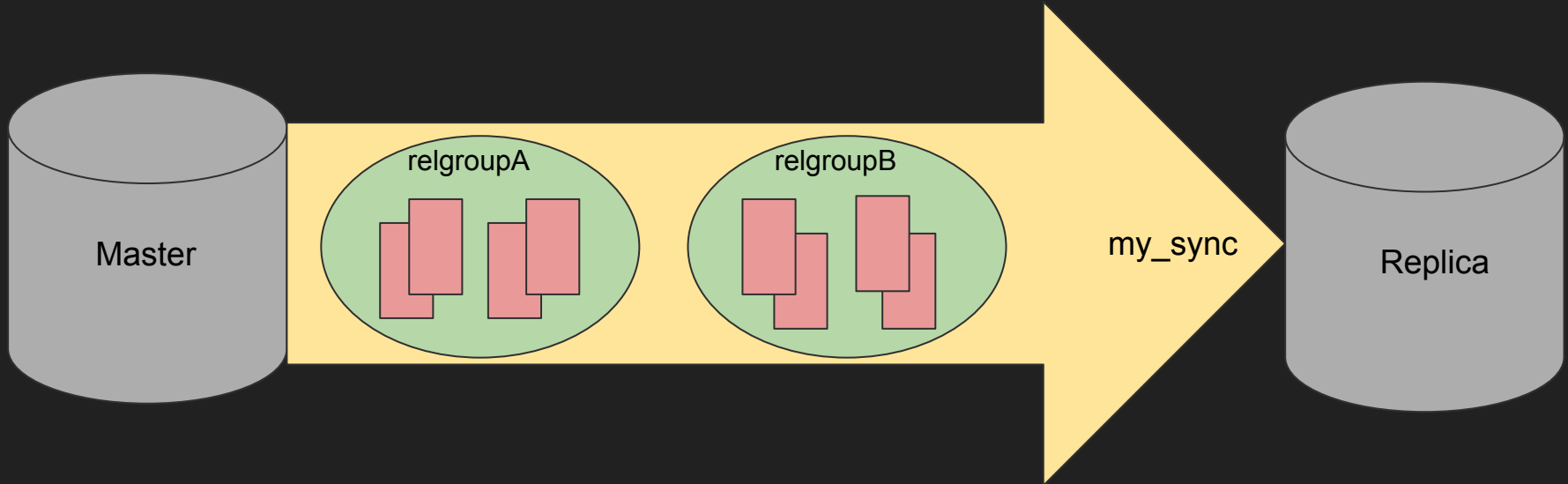
Aurora

Transfer Options

- ~~Dump and Restore~~ Would take two weeks
- ~~Binary Streaming~~ Incompatible Data Format
- ~~pg_logical~~ No WAL in Aurora/RDS
- ~~AWS DMS~~ Struggled at our scale
- ~~Stony~~ Needs extension
- Bucardo

Bucardo Fundamentals

<https://bucardo.org/Bucardo/>





Bucardo.pm

my_table

1, foo
2, bar
3, baz

Triggers:

bucardo_delta_my_table 
bucardo_kick_sync_mysync 
bucardo_note_trunc_sync_mysync

my_table_delta

3, 2019-03-07-10:23:00

NOTIFY

bucardo, 'fire mysync'



Replica

my_table

1, foo
2, bar
3, baz

To Recap

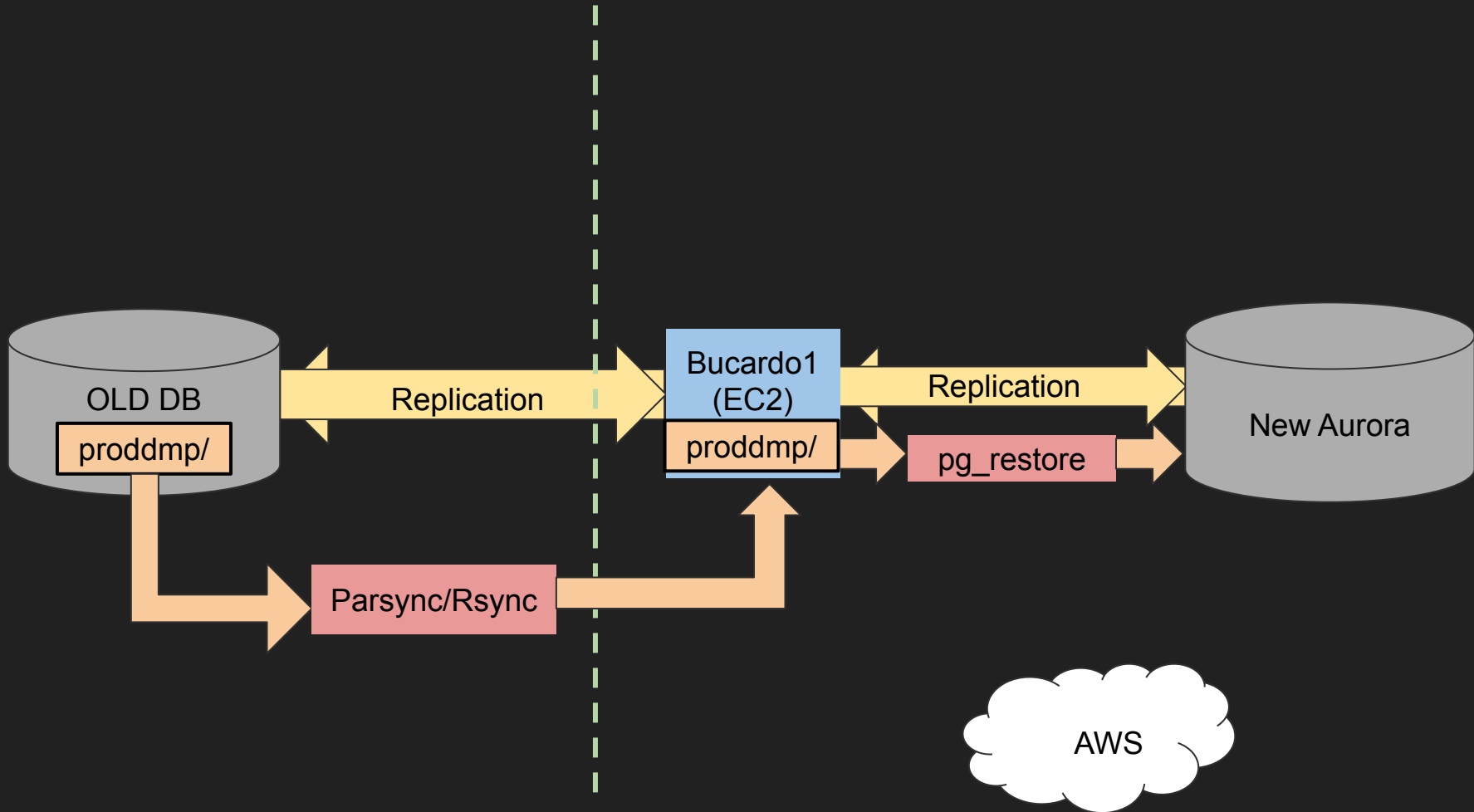
- Move 14 TB
- Track All Changes
- Replicate All Changes
- Freeze Schema
- Reversible
- FAST!
- Incognito



OCTOBER 2018						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	1	2	3	4	5	6
	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3

Printable Calendars From 123Calendars.Com





pg_dump/restore

- --format=directory
- --section=
 - bigint migration
 - pre-data
 - data
 - post-data
- -z 3
- -j 18

Forking Bucardo

```
CREATE OR REPLACE FUNCTION public.rds_session_replication_role(role text)
RETURNS text
LANGUAGE plpgsql
SECURITY DEFINER
AS $function$
    DECLARE
        curr_val text := 'unset';
    BEGIN
        EXECUTE 'SET session_replication_role = ' || quote_literal(role);
        EXECUTE 'SHOW session_replication_role' INTO curr_val;
        RETURN curr_val;
    END
$function$;

revoke all on function rds_session_replication_role(text) from public;
grant execute on function rds_session_replication_role(text) to procore_db;
```

Line 3183=

```
$dbh->do(q{DO LANGUAGE plpgsql $$DECLARE somevar VARCHAR; BEGIN  
SELECT p.proname INTO somevar FROM pg_catalog.pg_proc p WHERE  
p.proname = 'rds_session_replication_role' LIMIT 1; IF NOT FOUND THEN SET  
session_replication_role = 'replica'; ELSE PERFORM  
compose_session_replication_role('replica'); END IF; END$;});
```

<https://github.com/aks/bucardo.git>
~ line 7195

```
or  
($scol->{ftype} eq 'integer' and $fcol->{ftype} eq 'bigint')  
or  
($scol->{ftype} eq 'bigint' and $fcol->{ftype} eq 'integer' and $ENV{BUCARDO_BIGINT_TO_INT_OK})  
or  
($scol->{ftype} =~ /^timestamp/ and $fcol->{ftype} =~ /^timestamp/)
```

Final Tests



Go Time!

integer[]

```
or
($scol->{ftype} eq 'integer' and $fcol->{ftype} eq 'bigint')
or
($scol->{ftype} eq 'integer[]' and $fcol->{ftype} eq 'bigint[]')
or
( $ENV{BUCARDO_BIGINT_TO_INT_OK}
  and
  (
    ($scol->{ftype} eq 'bigint' and $fcol->{ftype} eq 'integer')
    or
    ($scol->{ftype} eq 'bigint[]' and $fcol->{ftype} eq 'integer[]')
  )
)
or
```

MARIO
007100

×02

WORLD
1-1

TIME
272

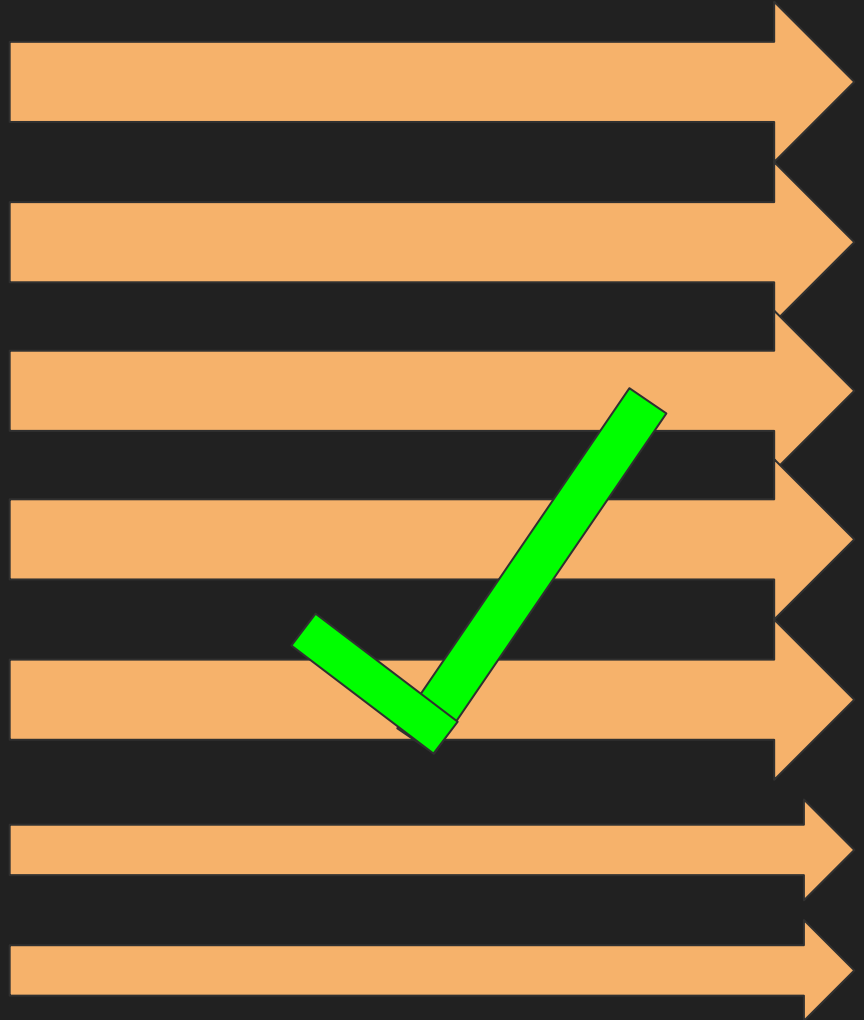
5000



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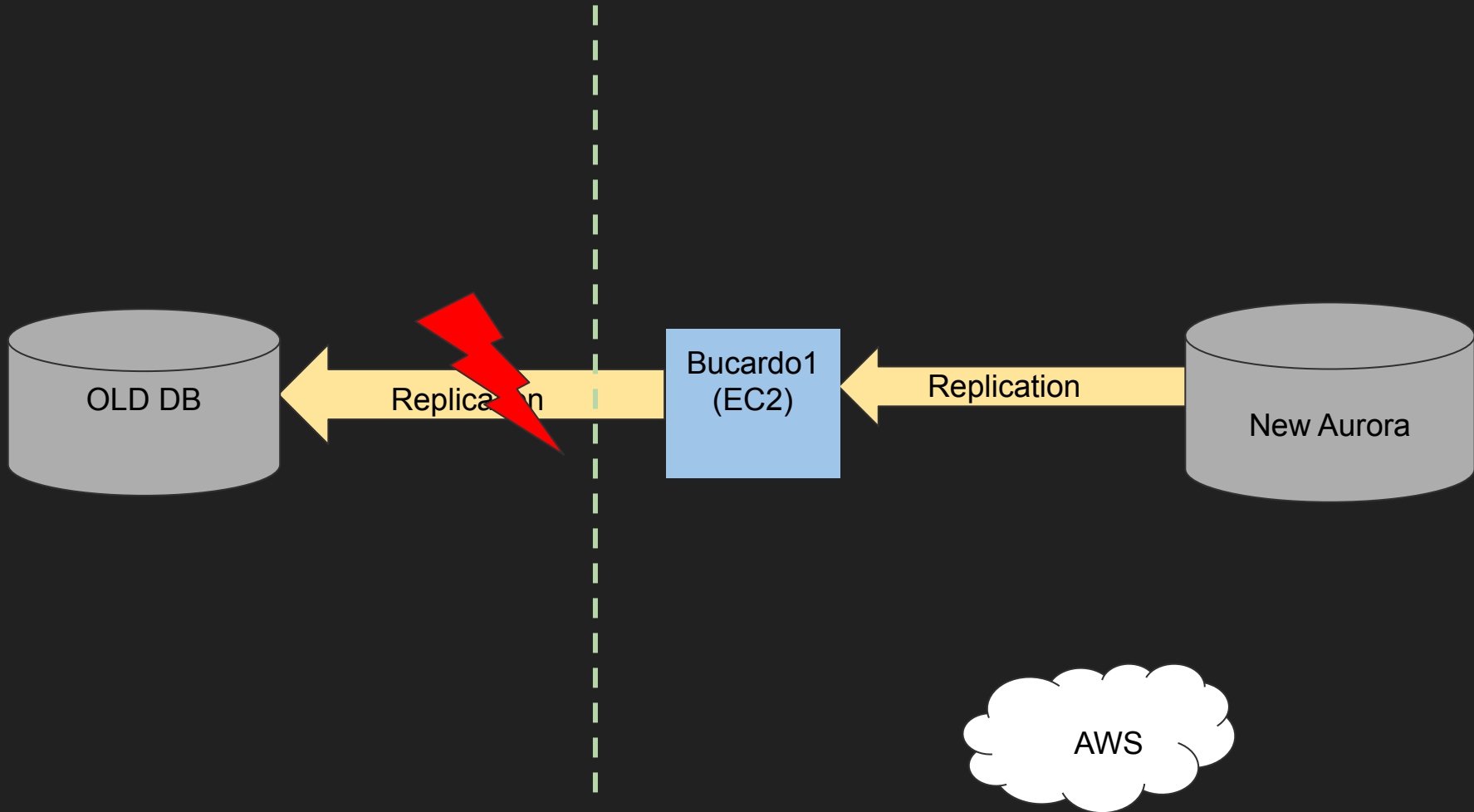




Autokick : Mes

ping=0







How Has it Been?



Questions?

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<https://www.procore.com/jobs>