

# No-Code Application Development and the Citizen Developer



Presented by Cal Fuerst



# Who is CitizenDeveloper?

- 15 Years in Central PA
- Makers of WorkXpress and CitizenDeveloper
- Located in Strawberry Square, 2nd Floor

We empower **NON-CODERS** to rapidly build **APPLICATIONS** that are:

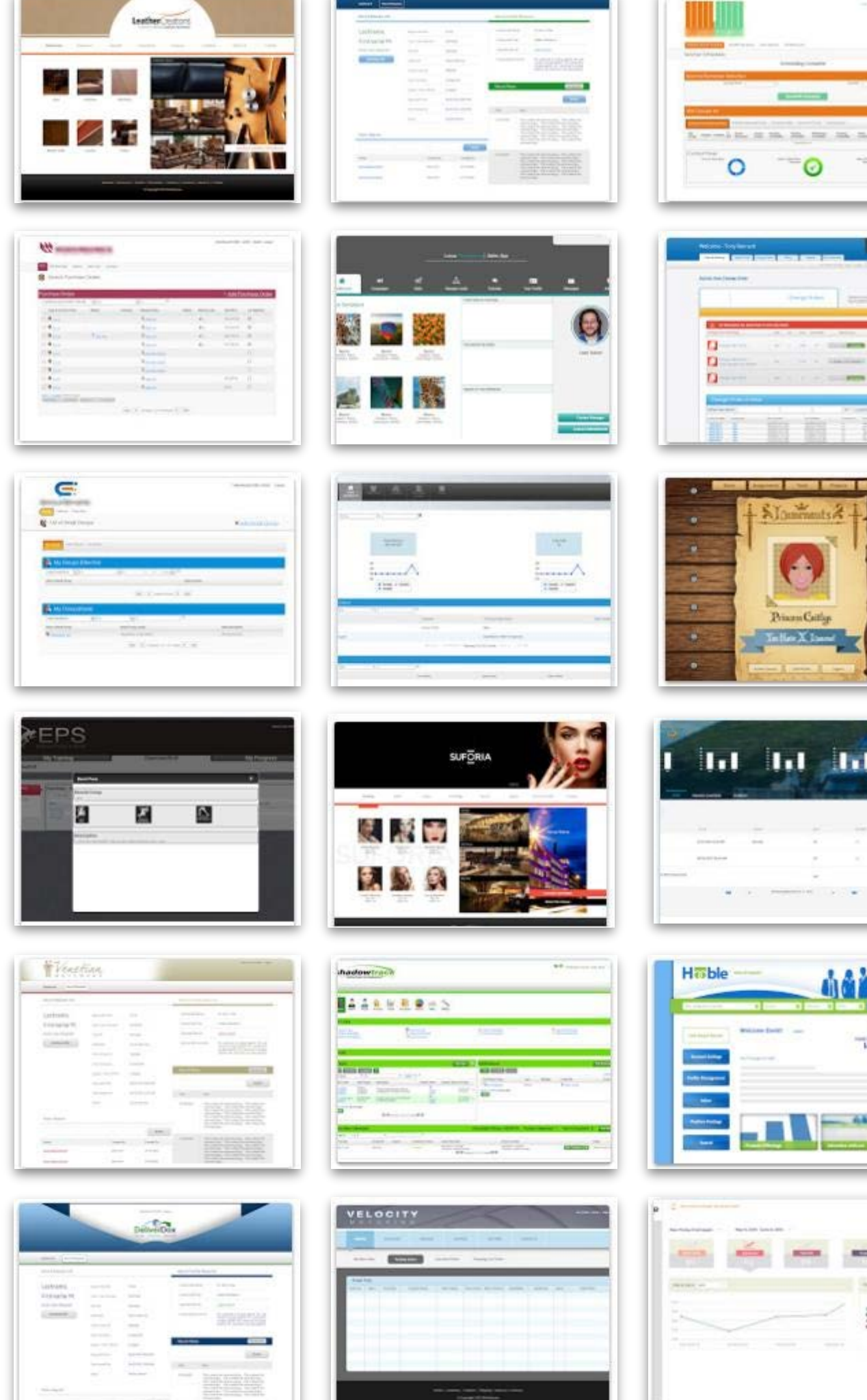
- Sophisticated
- Highly Secure
- Highly Performant
- Highly Scalable





Citizen Developers with no coding experience have ALREADY BUILT nearly 1000 sophisticated, real-world applications...

# THIS IS REAL, IT'S HAPPENING!



# Global Reach: 500,000 Users On 6 Continents



Airline  
Apparel & Accessories  
Architecture  
Authors  
Automotive  
Advertising  
Banking  
Beverage & Tobacco  
Biotechnology  
Broadcasting  
Brokerage  
Business  
Call Centers  
Cargo Handling  
Chemical  
Computer  
Construction  
Consulting  
Consumer Products  
Legal  
Manufacturing  
Marketing  
Media  
Military  
Motion Picture & Video  
Music  
Newspaper Publishers  
Online Auctions  
Packaging  
Parks and Recreation  
Pension Funds  
Pharmaceuticals  
Politics  
Private Equity  
Publishing  
Real Estate  
Retail & Wholesale  
Robotics

## Serving Every Major Industry

Entertainment & Leisure  
Executive Search  
Financial Services  
Food Production  
Gambling  
Government  
Grocery  
Health Care  
Human Resources  
Internet Publishing  
Technology  
Telecommunications  
Television  
Transportation  
Travel Services  
Trucking  
Utilities  
Venture Capital  
Web Development  
And More!

2012 Technology Product of the Year (TechQuest)  
Top 50 SaaS company (SaaS Chronicles.net)  
Top 150 Player Cloud Computing (Syscon)  
“Strong Performer” (Forrester - 2011 Wave)  
“Who’s who in PaaS” (Gartner)  
“100 Cloud Vendors you should know” (Alsbridge)  
“stands to disrupt an entire previous generation of technology”  
(IDC)

**Winners of numerous awards  
and analyst accolades - AND  
WE’RE JUST GETTING  
STARTED!!**





# Back End Demo

A CitizenDeveloper wishes to Import ~10,000 Accounts, ~10,000 Contacts, and relate them together - all asynchronously (in parallel).

Each record receives additional logic processing for e.g. duplicates, etc.

(\*\*NOTE: System capacity was intentionally cut back to below-minimum conditions: hardware, database nodes, and 5 threads per service, in order to stretch out the demonstration time frame\*\*)



# Import was setup without Code:

The workflow is configured as follows:

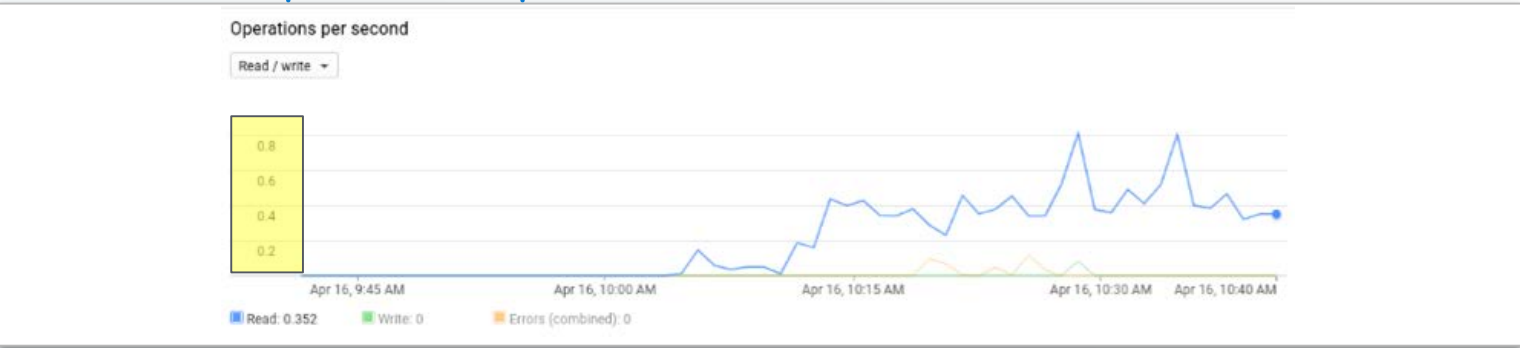
- Toast Message:**
  - Title: "Processing Customer Import..."
  - Message Text: ""
  - Level: Info
- Read CSV:**
  - CSV Source: File Attachment Field
  - Read CSV From Record: DB, Current Record (Installations)
  - Read CSV From Field: Customer Import File Attachment
  - Define Columns: By Header Name
  - Column Headers: ID,LEGAL\_NAME\_OF\_CARRIER,IRS\_EMPLOYER\_ID\_COD,DBA...
  - In: Parallel
- For Each Row of the CSV:**
  - Query Records:** as Existing Account???
  - if:** Value from Existing Account??? in Record ID is empty
    - do:**
      - Create Record of type:** Account
        - New Record Context Name: New Account
        - Current Document Number: 1
        - Created On: Timestamp
        - Account CID: CSV - Column ID
        - Company Name: CSV - Column LEGAL\_NAME\_OF\_CARRIER
        - EIN Number: CSV - Column IRS\_EMPLOYER\_ID\_COD
        - DBA: CSV - Column DBA
        - Billing Address Street 1: CSV - Column BILLING\_TRS\_ADDRESS\_1
        - Billing Address Street 2: create text with CSV - Column BILLING\_TRS\_ADDRESS\_2
        - Billing Address Street 3: CSV - Column BILLING\_TRS\_ADDRESS\_3
        - Billing Address City: CSV - Column BILLING\_TRS\_CITY
        - Billing Address Province Territory: CSV - Column BILLING\_TRS\_ST
        - Billing Address Postal Code: CSV - Column BILLING\_TRS\_ZIP
        - Phone Number Full Field: create text with CSV - Column BILLING\_TRS\_CONTACT\_EXT

# Time = 0: “systems at rest”

## Service Requests:

Overview				Messages			Message rates		
Name	Node	Features	State	▼ Ready	Unacked	Total	incoming	deliver / get	ack
zECHh5uGK1A_PRo0AAAI	10.60.0.7	+2 D ha-all	idle	0	0	0	0.00/s	0.00/s	0.00/s
ssTtcXaSALb6hmXAAAk	10.60.0.7	+2 D ha-all	idle	0	0	0			
sXwUK8A2BdA-AAaSAAAJ	10.60.0.7	+2 D ha-all	idle	0	0	0			
relation-delete-v1	10.60.2.6	+2 D ha-all	idle	0	0	0			
relation-add-v1	10.60.1.7	+2 D ha-all	idle	0	0	0	0.00/s	0.00/s	0.00/s
record-read-v1	10.60.1.7	+2 D ha-all	idle	0	0	0	0.00/s	0.00/s	0.00/s
record-edit-v2	10.60.1.7	+2 D ha-all	idle	0	0	0	0.00/s	0.00/s	0.00/s
record-delete-v1	10.60.2.6	+2 D ha-all	idle	0	0	0			
record-browse-v1	10.60.0.7	+2 D ha-all	idle	0	0	0	0.00/s	0.00/s	0.00/s
record-add-v2	10.60.0.7	+2 D ha-all	idle	0	0	0	0.00/s	0.00/s	0.00/s
record-add-v1	10.60.2.6	+2 D ha-all	idle	0	0	0	0.00/s	0.00/s	0.00/s
query-processor-v1	10.60.1.7	+2 D ha-all	idle	0	0	0	0.00/s	0.00/s	0.00/s

## Database Operations per Second:



## Hardware Allocated:

Name	Status	CPU requested	CPU allocatable	Memory requested	Memory allocatable
gke-stage03-default-pool-27c129e9-hdvh	Ready	920 mCPU	3.92 CPU	8.52 GB	13.01 GB
gke-stage03-default-pool-27c129e9-hlrd	Ready	1.46 CPU	3.92 CPU	9.83 GB	13.01 GB
gke-stage03-default-pool-27c129e9-j4mb	Ready	1.76 CPU	3.92 CPU	10.79 GB	13.01 GB
gke-stage03-default-pool-27c129e9-jdx3	Ready	1.25 CPU	3.92 CPU	10.58 GB	13.01 GB

## MicroServices Count:

Name	Status	Pods
rabbitmq-deployment	OK	3/3
action-processor-v1	OK	2/2
dsconn-spanner-record-add-v1	OK	2/2
dsconn-spanner-record-edit-v1	OK	2/2
expression-processor-v2	OK	2/2
query-processor-v1	OK	2/2
record-add-v1	OK	2/2
record-add-v2	OK	2/2
record-browse-v1	OK	2/2
record-delete-v1	OK	2/2
record-edit-v2	OK	2/2
record-read-v1	OK	2/2
relation-add-v1	OK	2/2

## Record Counts:

```
ts: 0
1
relationships: 0
-----
ts: 0
1
relationships: 0
-----
ts: 0
1
relationships: 0
-----
ts: 0
1
relationships: 0
-----
ts: 0
1
relationships: 0
```



# Time = 1: “asynchronous flood of query requests!”

## Service Requests:

Overview				Messages		
Name	Node	Features	State	Ready	Unacked	Total
query-processor-v1	10.60.1.7	+2 D ha-all	running	9,000	10	9,010
record-add-v2	10.60.0.7	+2 D ha-all	running	39	10	49
zECHh5uGK1A_PRo0AAAI	10.60.0.7	+2 D ha-all	idle	0	0	0
ssTtcXaSALb6hImXAAAk	10.60.0.7	+2 D ha-all	idle	0	0	0
sXwUK8A2BdA-AAaSAAAJ	10.60.0.7	+2 D ha-all	idle	0	0	0
relation-delete-v1	10.60.2.6	+2 D ha-all	idle	0	0	0
relation-add-v1	10.60.1.7	+2 D ha-all	running	0	8	8

## Record Counts:

Accounts:	0
Users:	1
Admin relationships:	0
Accounts:	19
Users:	1
Admin relationships:	0
Accounts:	150
Users:	1
Admin relationships:	0
Accounts:	278
Users:	1
Admin relationships:	0
Accounts:	407
Users:	1
Admin relationships:	0
Accounts:	523
Users:	1
Admin relationships:	0
Accounts:	650
Users:	1
Admin relationships:	0

## MicroServices Count:

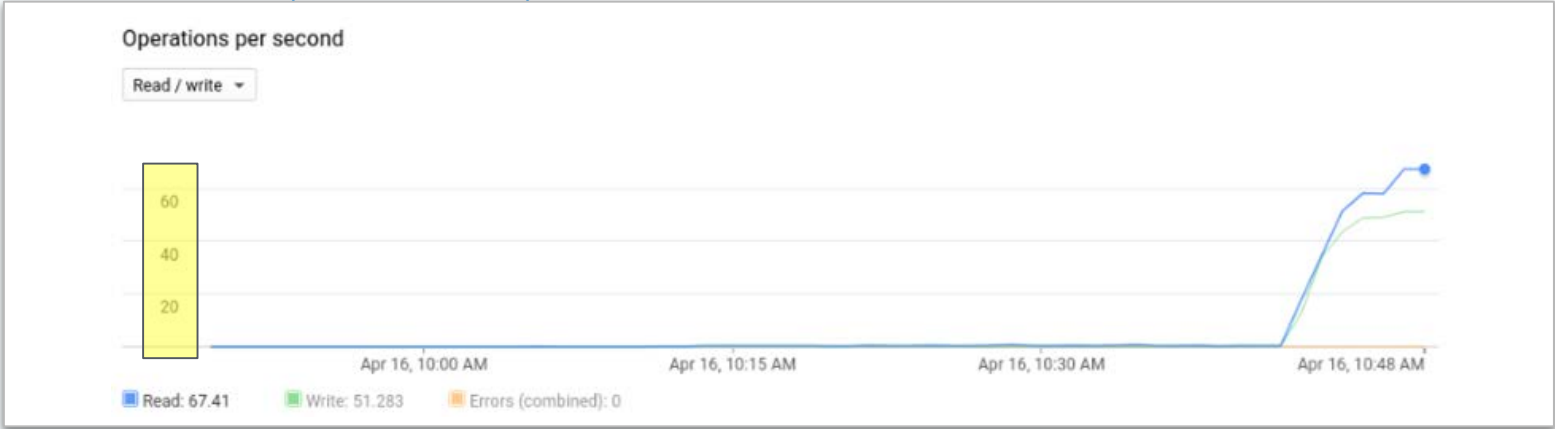
Name	Status	Pods
dsconn-spanner-record-add-v1	OK	4/4
rabbitmq-deployment	OK	3/3
record-add-v2	OK	3/3
relation-add-v1	OK	3/3
query-processor-v1	Does not have minimum availability	2/4
action-processor-v1	OK	2/2
dsconn-spanner-record-edit-v1	OK	2/2
expression-processor-v2	OK	2/2

# Time = 5: “add hardware, auto-shift to relationships”

## Service Requests:

Overview					Messages			Message rates		
Name	Node	Features	State	Ready	Unacked	Total	incoming	deliver / get	ack	
query-processor-v1	10.60.1.7	+2 D ha-all	running	8,184	35	8,219	32/s	62/s	62/s	
record-add-v2	10.60.0.7	+2 D ha-all	running	7	25	32	40/s	42/s	42/s	
dsconn-spanner-record-add-v1	10.60.0.7	+2 D ha-all	running	0	23	23	42/s	42/s	42/s	
relation-add-v1	10.60.1.7	+2 D ha-all	running	2,186	20	2,206	122/s	34/s	34/s	
action-processor-v1	10.60.1.7	+2 D ha-all	idle	0	8	8	0.00/s	0.00/s	0.00/s	

## Database Operations per Second:



## Hardware Allocated:

Name	Status	CPU requested	CPU allocatable	Memory requested	Memory allocatable
gke-stage03-default-pool-27c129e9-hdvf	Ready	1.22 CPU	3.92 CPU	12.22 GB	13.01 GB
gke-stage03-default-pool-27c129e9-hlrd	Ready	1.66 CPU	3.92 CPU	12.23 GB	13.01 GB
gke-stage03-default-pool-27c129e9-j4mb	Ready	1.86 CPU	3.92 CPU	12.09 GB	13.01 GB
gke-stage03-default-pool-27c129e9-jdx3	Ready	1.35 CPU	3.92 CPU	12.08 GB	13.01 GB
gke-stage03-default-pool-27c129e9-mkn6	Ready	900 mCPU	3.92 CPU	9.71 GB	13.01 GB

## Record Counts:

## MicroServices Count:

Name	Status	Pods
query-processor-v1	OK	7/7
dsconn-spanner-record-add-v1	OK	6/6
record-add-v2	OK	5/5
relation-add-v1	OK	4/4
rabbitmq-deployment	OK	3/3
action-processor-v1	OK	2/2
dsconn-spanner-record-edit-v1	OK	2/2
expression-processor-v2	OK	2/2
record-add-v1	OK	2/2
record-browse-v1	OK	2/2
record-delete-v1	OK	2/2
record-edit-v2	OK	2/2
record-read-v1	OK	2/2
relation-delete-v1	OK	2/2
api-gateway	OK	1/1

Accounts: 9067	Users: 23	Admin relationships: 21
Accounts: 9067	Users: 27	Admin relationships: 25
Accounts: 9067	Users: 35	Admin relationships: 34
Accounts: 9067	Users: 41	Admin relationships: 39
Accounts: 9067	Users: 47	Admin relationships: 45
Accounts: 9067	Users: 53	Admin relationships: 52
Accounts: 9067	Users: 182	Admin relationships: 93
Accounts: 9067	Users: 502	Admin relationships: 186
Accounts: 9067	Users: 810	Admin relationships: 280
Accounts: 9067	Users: 1095	Admin relationships: 363
Accounts: 9067	Users: 1394	Admin relationships: 452

# Time = 10: “queries auto-scale down, sudden demand for relation-add”

## Service Requests:

Overview					Messages			Message rates		
Name	Node	Features	State	Ready	Unacked	Total	Incoming	deliver / get	ack	
relation-add-v1	10.60.1.7	+2	running	11,655	35	11,690	0.00/s	64/s	64/s	
query-processor-v1	10.60.1.7	+2	running	0	9	9	22/s	22/s	22/s	
action-processor-v1	10.60.1.7	+2	idle	0	2	2	0.00/s	0.00/s	0.00/s	
zECHh5uGK1A_PRoAAAAI	10.60.0.7	+2	idle	0	0	0	0.00/s	0.00/s	0.00/s	

## Database Operations per Second:



## Hardware Allocated:

Name	Status	CPU requested	CPU allocatable	Memory requested	Memory allocatable
gke-stage03-default-pool-27c129e9-81l2	Not ready	200 mCPU	3.92 CPU	209.72 MB	13.01 GB
gke-stage03-default-pool-27c129e9-hdvf	Ready	1.22 CPU	3.92 CPU	12.22 GB	13.01 GB
gke-stage03-default-pool-27c129e9-hlrd	Ready	1.66 CPU	3.92 CPU	12.23 GB	13.01 GB
gke-stage03-default-pool-27c129e9-j4mb	Ready	1.86 CPU	3.92 CPU	12.09 GB	13.01 GB
gke-stage03-default-pool-27c129e9-jdx3	Ready	1.31 CPU	3.92 CPU	12.87 GB	13.01 GB
gke-stage03-default-pool-27c129e9-mkn6	Ready	1.1 CPU	3.92 CPU	12.31 GB	13.01 GB
gke-stage03-default-pool-27c129e9-w7dt	Ready	1.24 CPU	3.92 CPU	12.42 GB	13.01 GB

## Record Counts:

## MicroServices Count:

Name	Status	Pods
query-processor-v1	OK	11/11
dsconn-spanner-record-add-v1	OK	8/8
record-add-v2	OK	8/8
relation-add-v1	Does not have minimum availability	7/10
rabbitmq-deployment	OK	3/3
action-processor-v1	OK	2/2
dsconn-spanner-record-edit-v1	OK	2/2
expression-processor-v2	OK	2/2
record-add-v1	OK	2/2
record-browse-v1	OK	2/2
record-delete-v1	OK	2/2
record-edit-v2	OK	2/2
record-read-v1	OK	2/2
relation-delete-v1	OK	2/2
api-gateway	OK	1/1

Accounts: 9067
Users: 9068
Admin relationships: 4297
Accounts: 9067
Users: 9068
Admin relationships: 4429
Accounts: 9067
Users: 9068
Admin relationships: 4562
Accounts: 9067
Users: 9068
Admin relationships: 4700
Accounts: 9067
Users: 9068
Admin relationships: 4865
Accounts: 9067
Users: 9068
Admin relationships: 5028
Accounts: 9067
Users: 9068
Admin relationships: 5180
Accounts: 9067
Users: 9068
Admin relationships: 5333

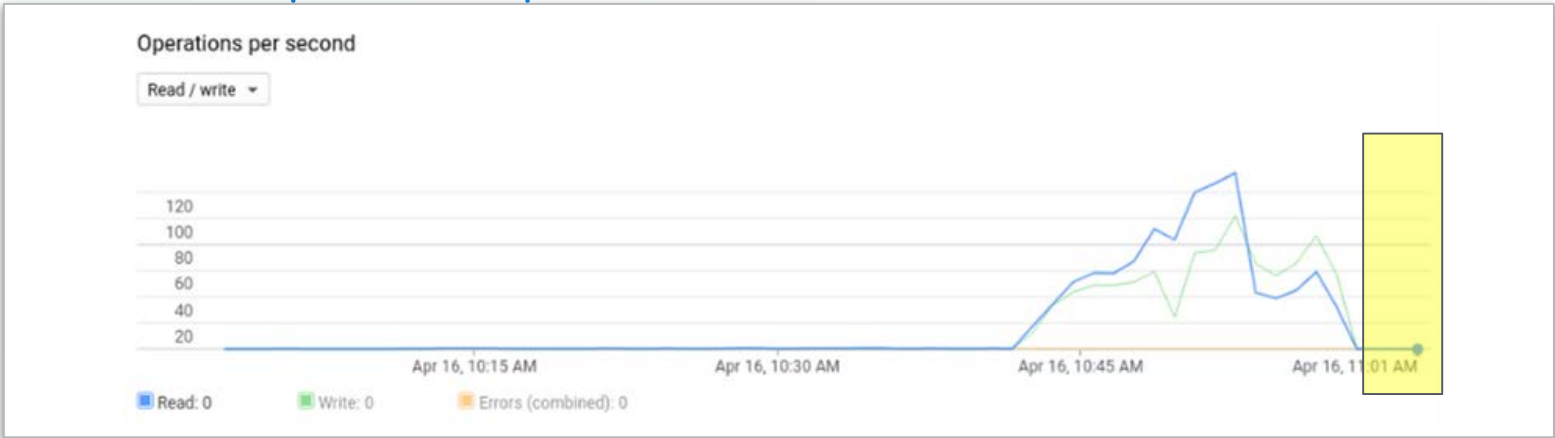


# Time = 15: “no service requests: auto-scale down”

## Service Requests:

Overview					Messages			Message rates		
Name	Node	Features	State		Ready	Unacked	Total	incoming	deliver / get	ack
2f0c0fc0028bf3b20a1740465085af1f.AKpPuOrStuI5G9z8AAAO	10.60.0.7	+2	ha-all	idle	0	0	0	0.00/s	0.00/s	0.00/s
2f7b0d1c5148552ab0d8df0c7f492826.AKpPuOrStuI5G9z8AAAO	10.60.0.7	+2	ha-all	idle	0	0	0	0.00/s	0.00/s	0.00/s
4ce871f3270cac5394e40bac96daf35c.FrGCENNREwIVVNktAAAt	10.60.0.7	+2	ha-all	idle	0	0	0			
51a6c23e866fc384688b761e910fec9d.iWozbEOISMsZYhPRAAAq	10.60.0.7	+2	ha-all	idle	0	0	0			

## Database Operations per Second:



## Hardware Allocated:

Name	Status	CPU requested	CPU allocatable	Memory requested	Memory allocatable
gke-stage03-default-pool-27c129e9-8112	Ready	600 mCPU	3.92 CPU	4.61 GB	13.01 GB
gke-stage03-default-pool-27c129e9-hdvh	Ready	1.02 CPU	3.92 CPU	9.62 GB	13.01 GB
gke-stage03-default-pool-27c129e9-hlrd	Ready	1.56 CPU	3.92 CPU	10.93 GB	13.01 GB
gke-stage03-default-pool-27c129e9-j4mb	Ready	1.76 CPU	3.92 CPU	10.79 GB	13.01 GB
gke-stage03-default-pool-27c129e9-jdx3	Ready	1.21 CPU	3.92 CPU	11.37 GB	13.01 GB
gke-stage03-default-pool-27c129e9-mkn6	Ready	500 mCPU	3.92 CPU	3.51 GB	13.01 GB
gke-stage03-default-pool-27c129e9-w7dt	Ready	638 mCPU	3.92 CPU	3.82 GB	13.01 GB

## Record Counts:

## MicroServices Count:

Name	Status	Pods
relation-add-v1	OK	15/2
rabbitmq-deployment	OK	3/3
action-processor-v1	OK	2/2
dsconn-spanner-record-add-v1	OK	2/2
dsconn-spanner-record-edit-v1	OK	2/2
expression-processor-v2	OK	2/2
query-processor-v1	OK	2/2
record-add-v1	OK	2/2
record-add-v2	OK	2/2
record-browse-v1	OK	2/2
record-delete-v1	OK	2/2
record-edit-v2	OK	2/2
record-read-v1	OK	2/2
relation-delete-v1	OK	2/2
api-gateway	OK	1/1

Accounts: 9067
Users: 9068
Admin relationships: 7899
Accounts: 9067
Users: 9068
Admin relationships: 8113
Accounts: 9067
Users: 9068
Admin relationships: 8339
Accounts: 9067
Users: 9068
Admin relationships: 8562
Accounts: 9067
Users: 9068
Admin relationships: 8795
Accounts: 9067
Users: 9068
Admin relationships: 9014
Accounts: 9067
Users: 9068
Admin relationships: 9067