μService Challenges

Fred George
fredgeorge@acm.org
@fgeorge52

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Why MicroSerices Now?

- Confluence of technologies
  - Cloud computing
  - Bandwidth
  - Languages (and supporting frameworks)
- Confluence of business needs
  - Silicon Valley innovators as role models
  - Accelerating business needs
  - Reduction of entry barriers for niche competitors

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Challenge 1

Synchronous or Asychronous

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Chad Fowler vs. Fred George

- Chad: Use Synchronous as default
  - Algorithms typically described serially
  - Programmer understanding / productivity
- Fred: Use Asynchronous as default
  - Robustness should be primary goal
  - Supports better de-coupling
  - Teach the programmers

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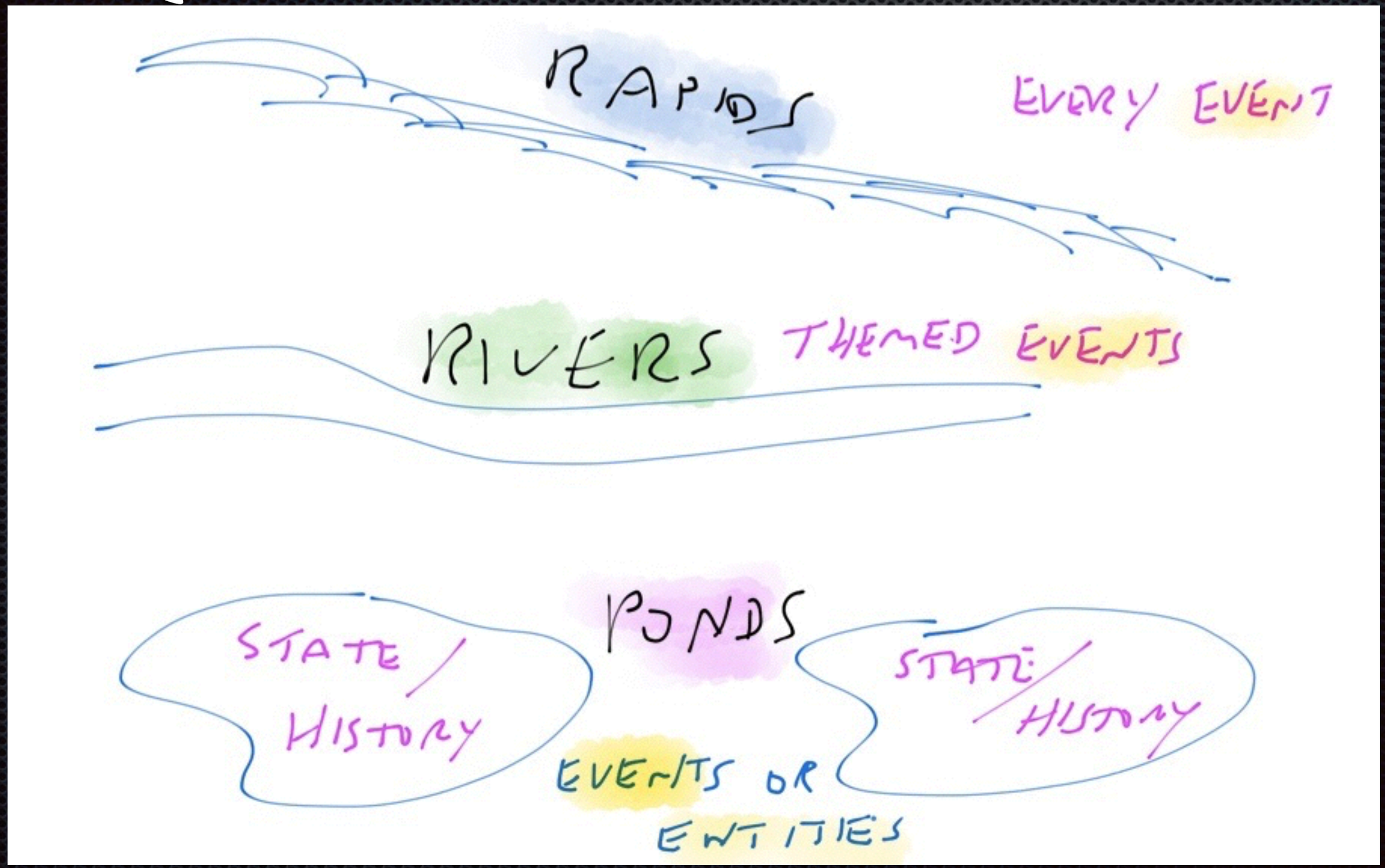
Rapids, Rivers, and Ponds



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Asynchronous Services

Bus

Service

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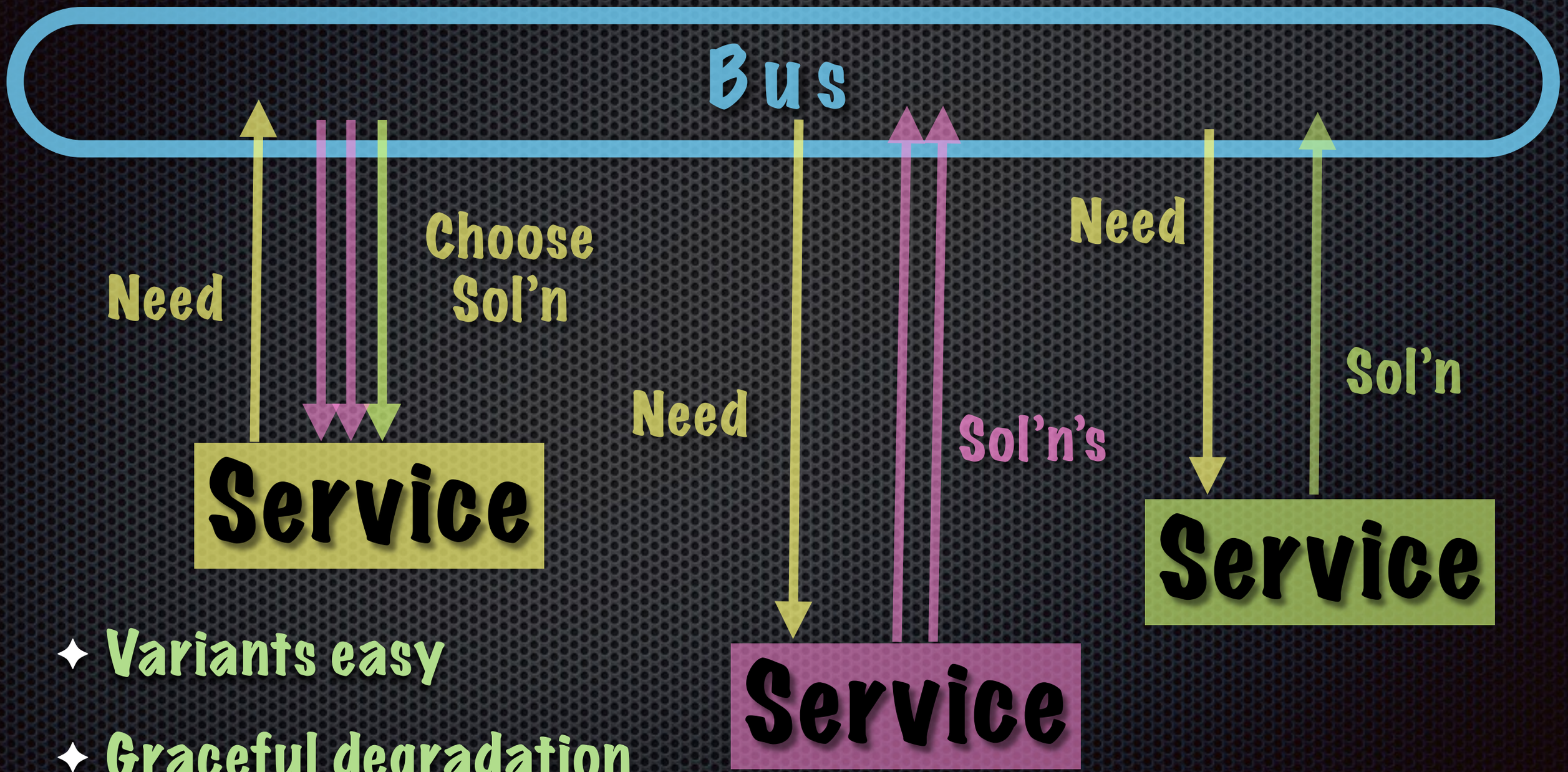
Asynchronous Services



- Variants easy
- Graceful degradation

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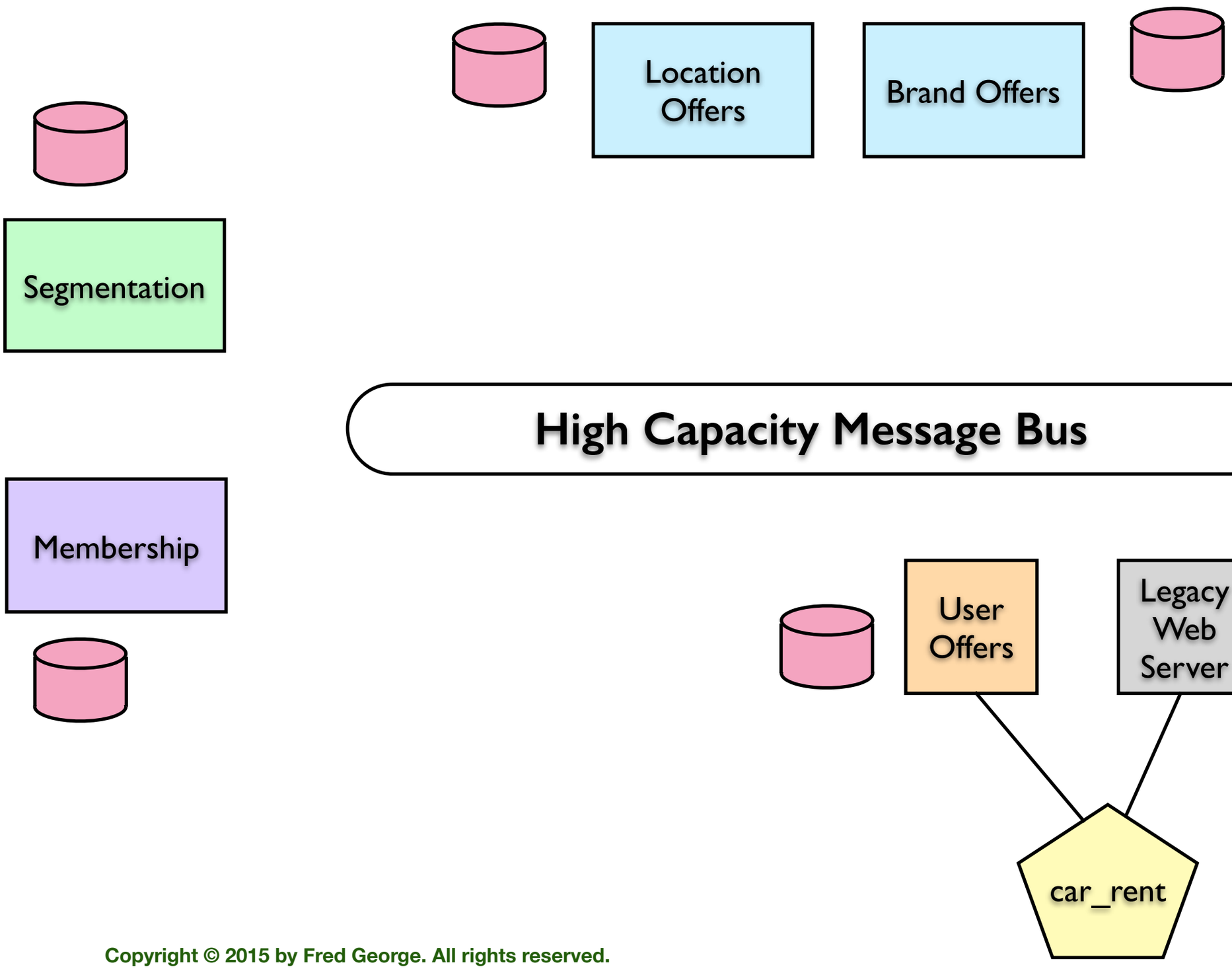
Sample µServices in Action



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Location Offers

Brand Offers

Segmentation

Membership

Page served... client accessible

User Offers

Legacy Web Server

Car_Rent.com

Login

car_rent

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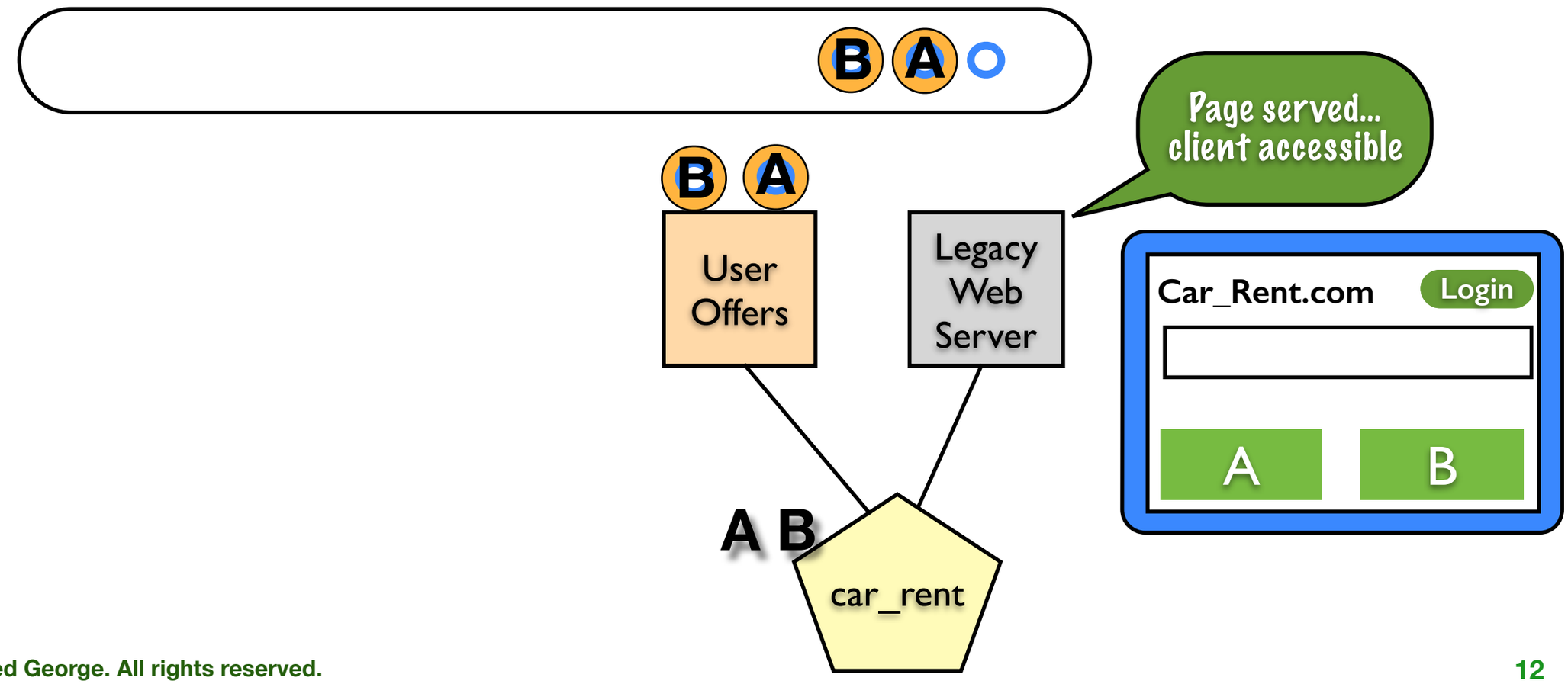
Location Offers

Brand Offers

Segmentation

Membership



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Location Offers

Brand Offers

Segmentation

Membership

B A

Sally logs in as Member

User Offers

Legacy Web Server

Car_Rent.com Login

Sally

A B

car_rent

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Location Offers

Brand Offers

Segmentation

Membership

D C B A

D C

User Offers

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A B

car_rent

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D C

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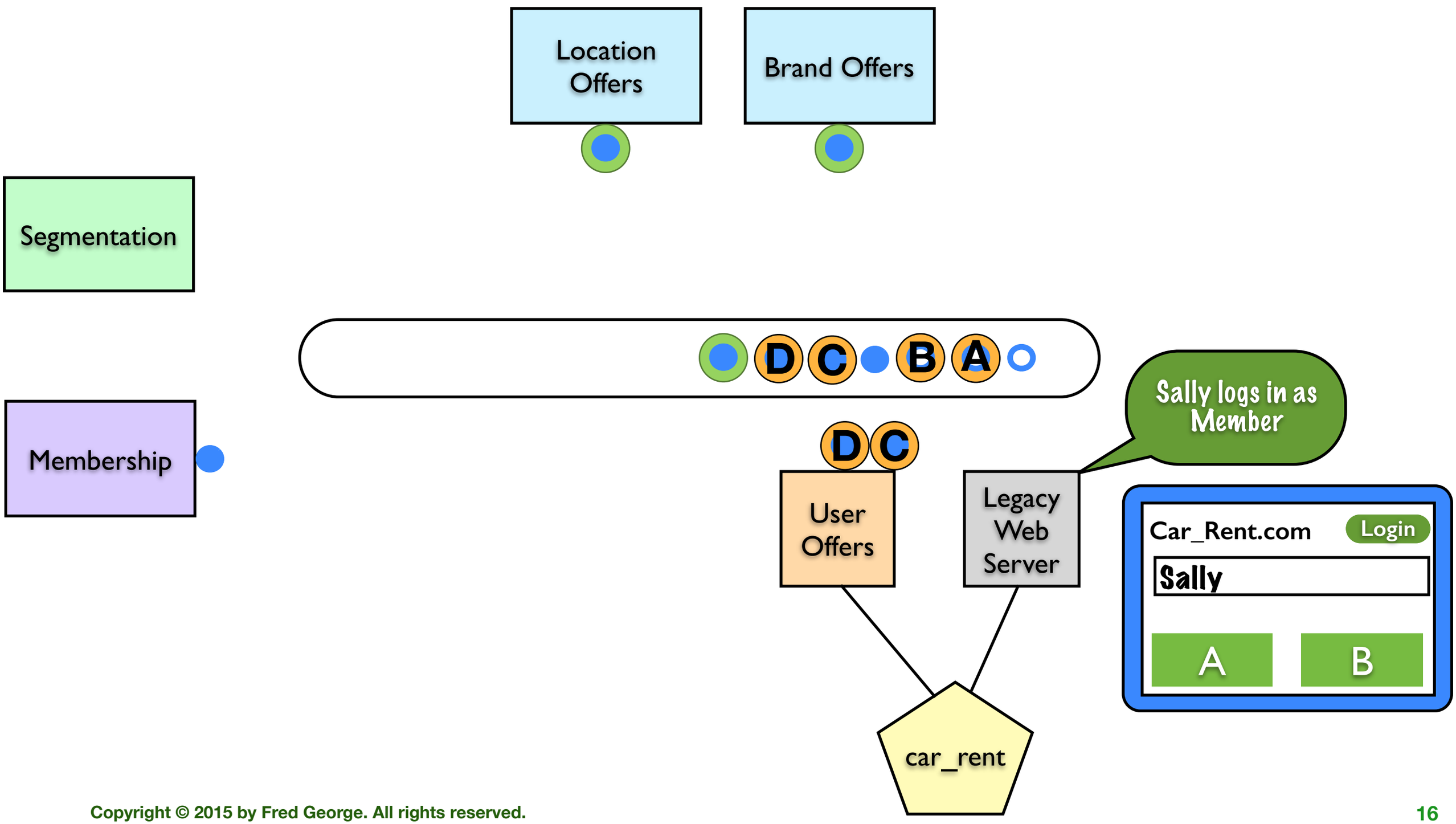

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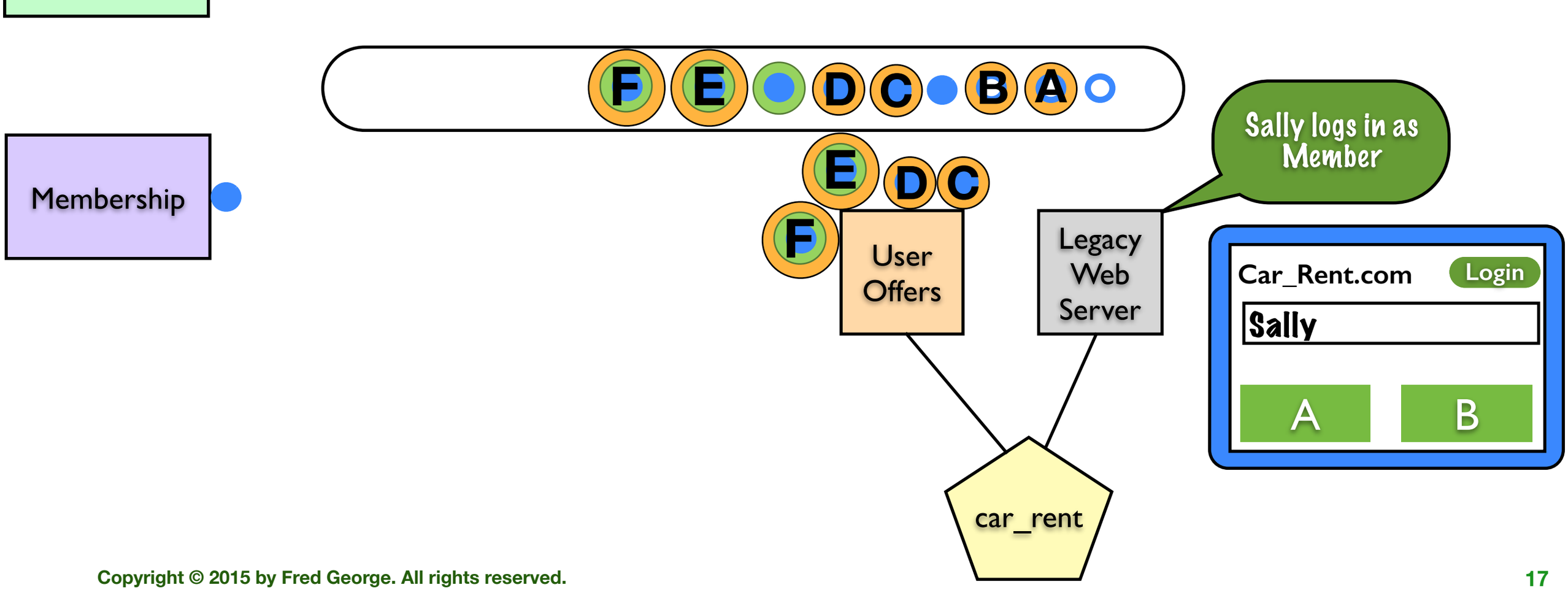
Brand Offers

Segmentation



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Location Offers

Brand Offers

Segmentation

Membership

F E D C B A

E D C F

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G C F E D C B A

C E D C

F

G

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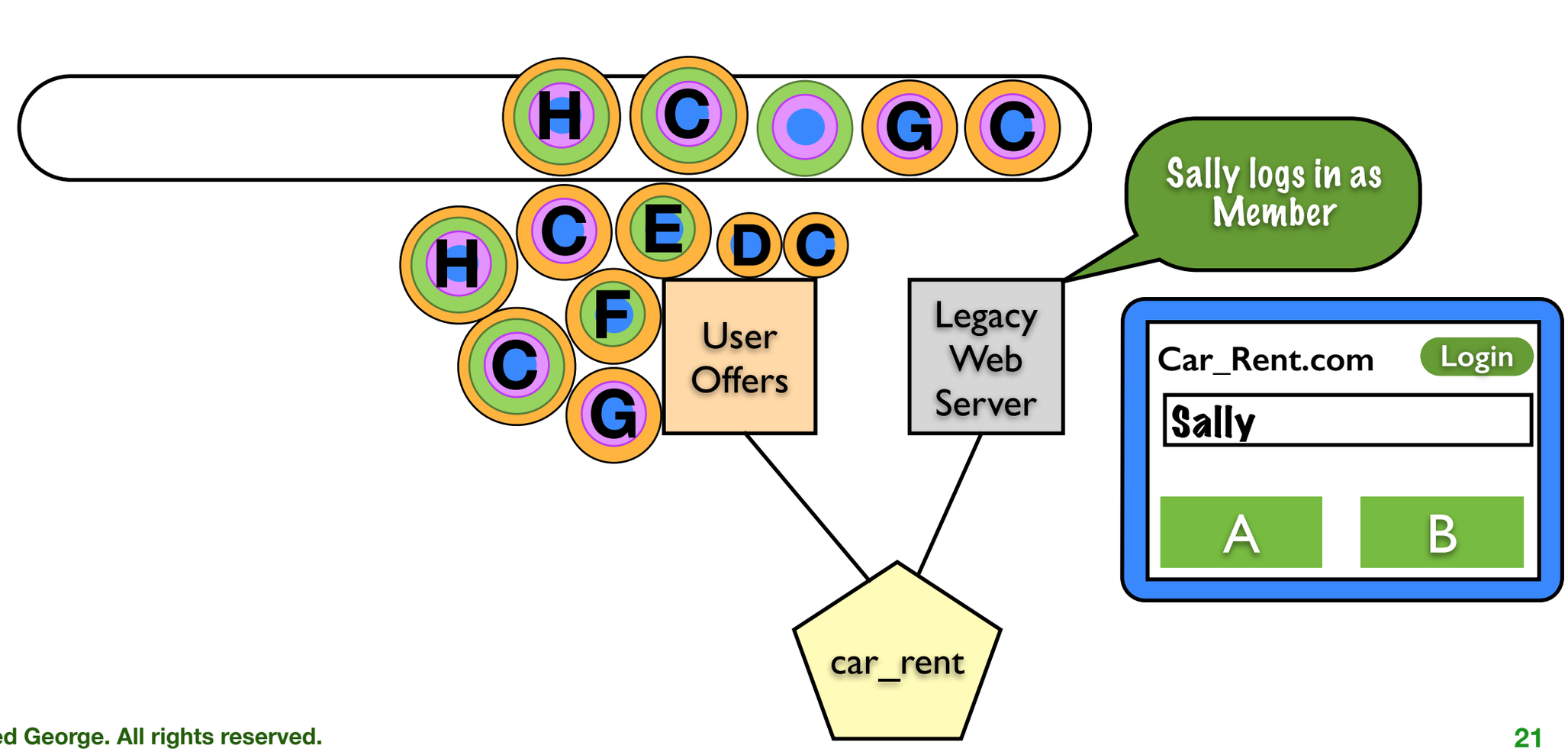

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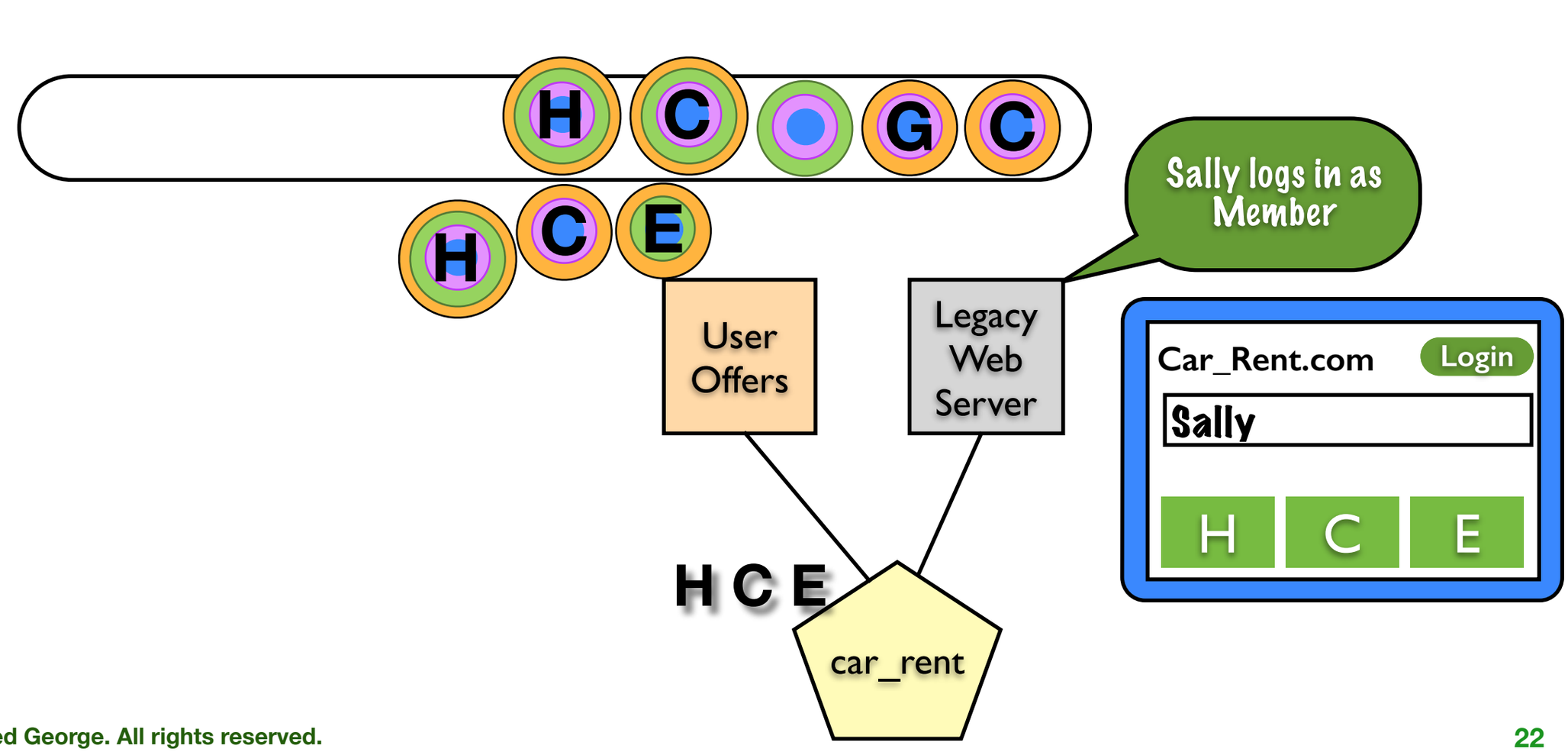

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Location Offers

Brand Offers

Segmentation

Membership

H C G C

H C E

User Offers

Legacy Web Server

Sally looks in Houston

Location: Houston

H

C

E

car_rent

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Challenge 2

Deconstructing the Database

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How Many Databases?

- Fortune 100 View:
  - Entity-oriented; consistent
  - As few as possible
- Micro-service view:
  - DB per micro-service
  - Poly-glot (various NoSQL, SQL) + event bus
  - 10% writable; fewer transactional

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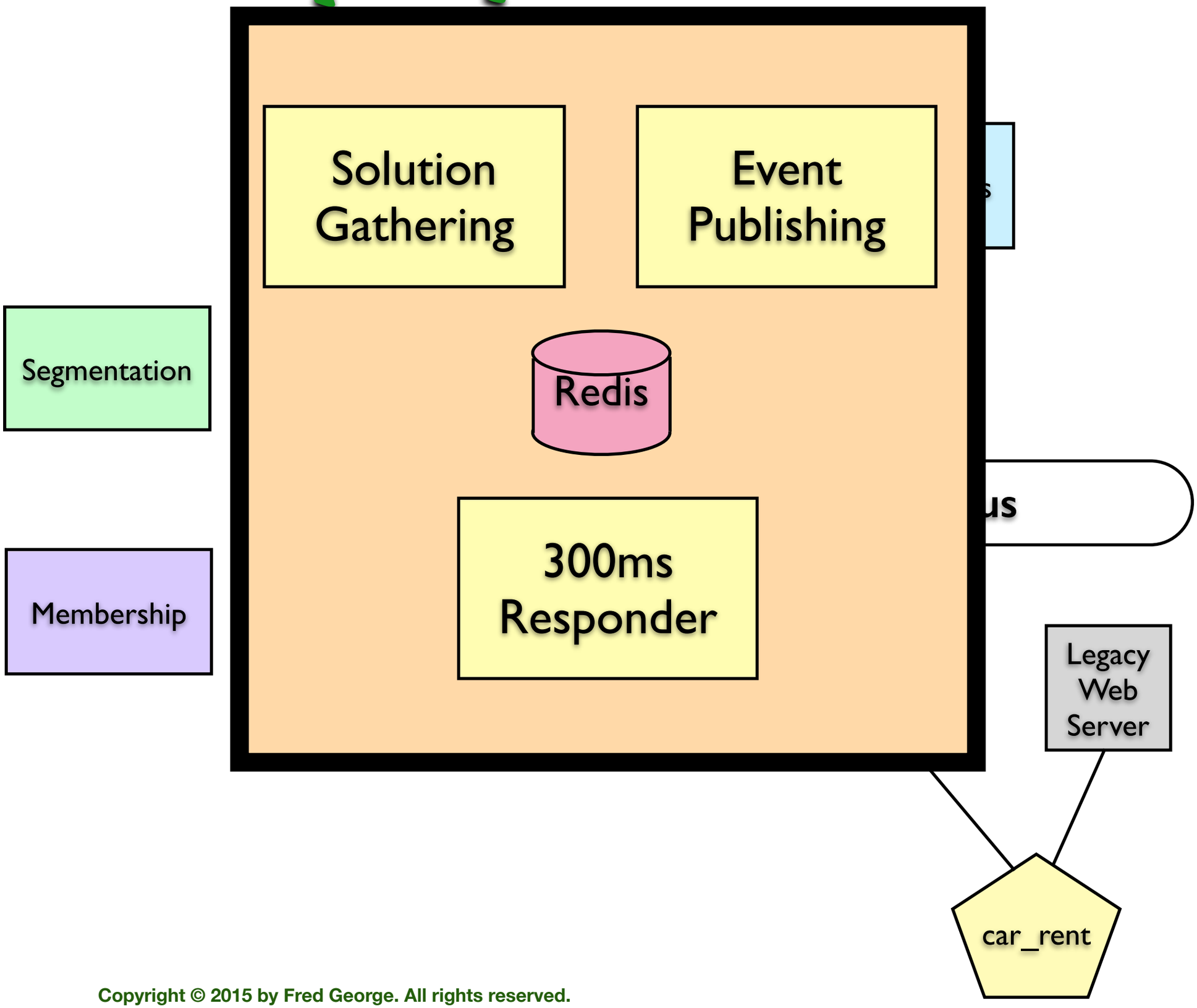
Sample µServices in Action



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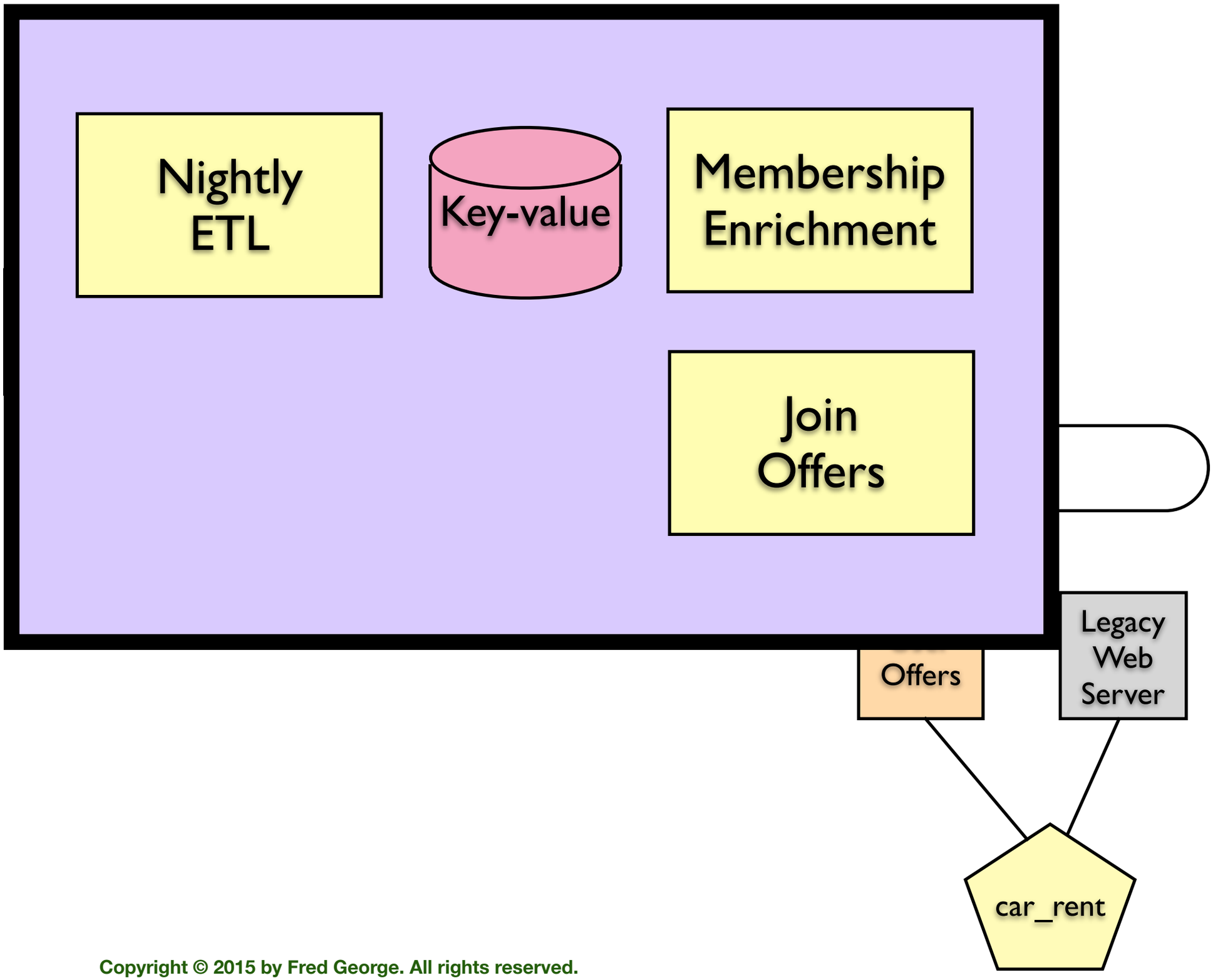
Sample µServices in Action



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Challenge 3

μServices or Clojure

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Services Like OO Classes

- Conceptualization (Job)
  - Every service has one job
  - If two jobs, make two services
- Encapsulation
  - Service has its own persistence
  - If shared persistence, just one service!

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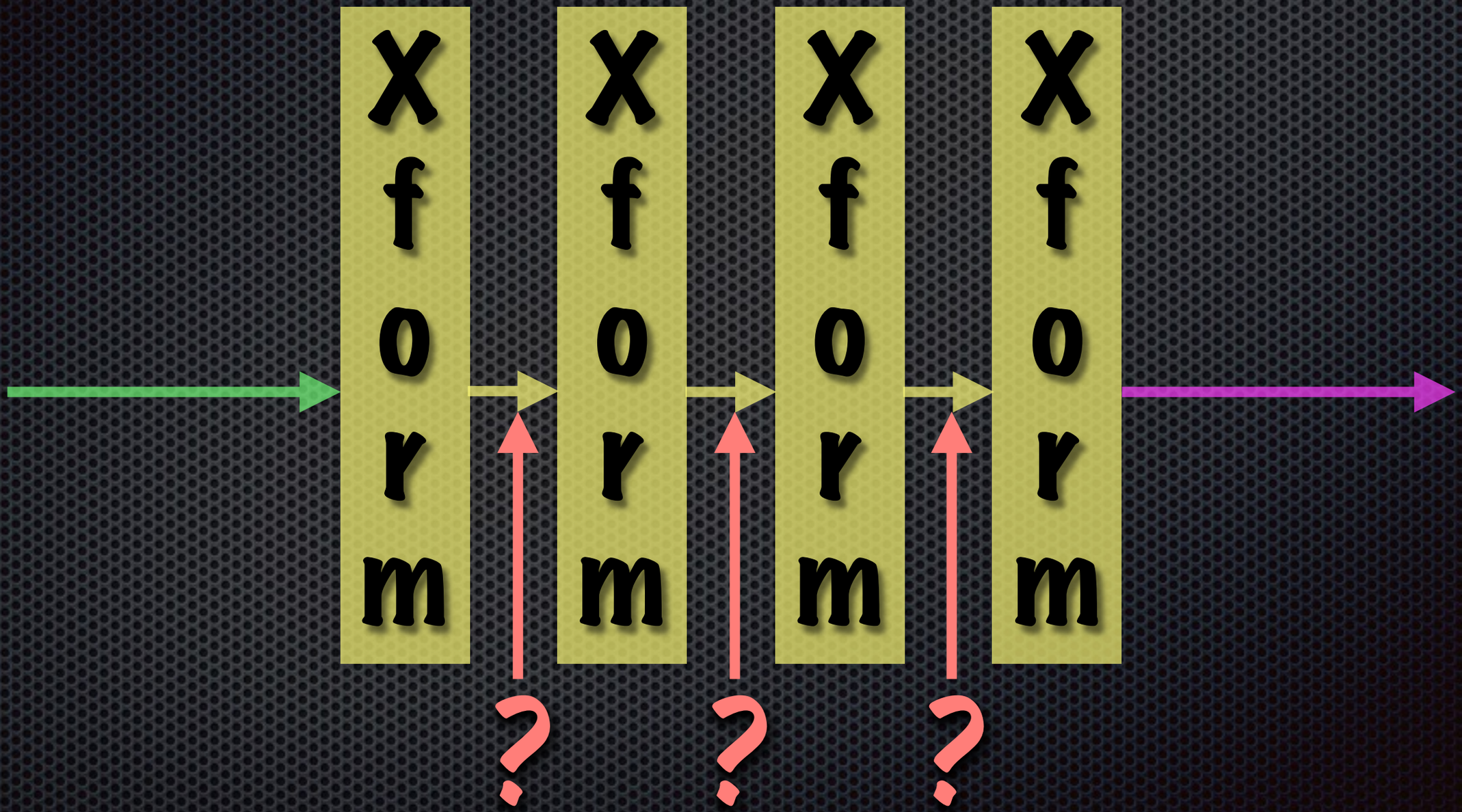
Clojure Loves Shared Data



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3 Companies - 3 Variants

	Forward 2008 - now	Daily Mail 2012 - now	Outpace 2013-now
Number	300+	3 + dozens ^^	25 vv
Languages	Ruby, Node.js, Clojure, R, ...	Node.js, Clojure	Clojure
Coupling	DB w cron, RESTful, Kafka bus	RabbitMQ bus	Orchestraton, RabbitMQ bus

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A New Hope...

elixir

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Challenge 4

Choosing Architecture and Frameworks

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NETFLIX

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Challenge 5

No Design Patterns Book Yet...

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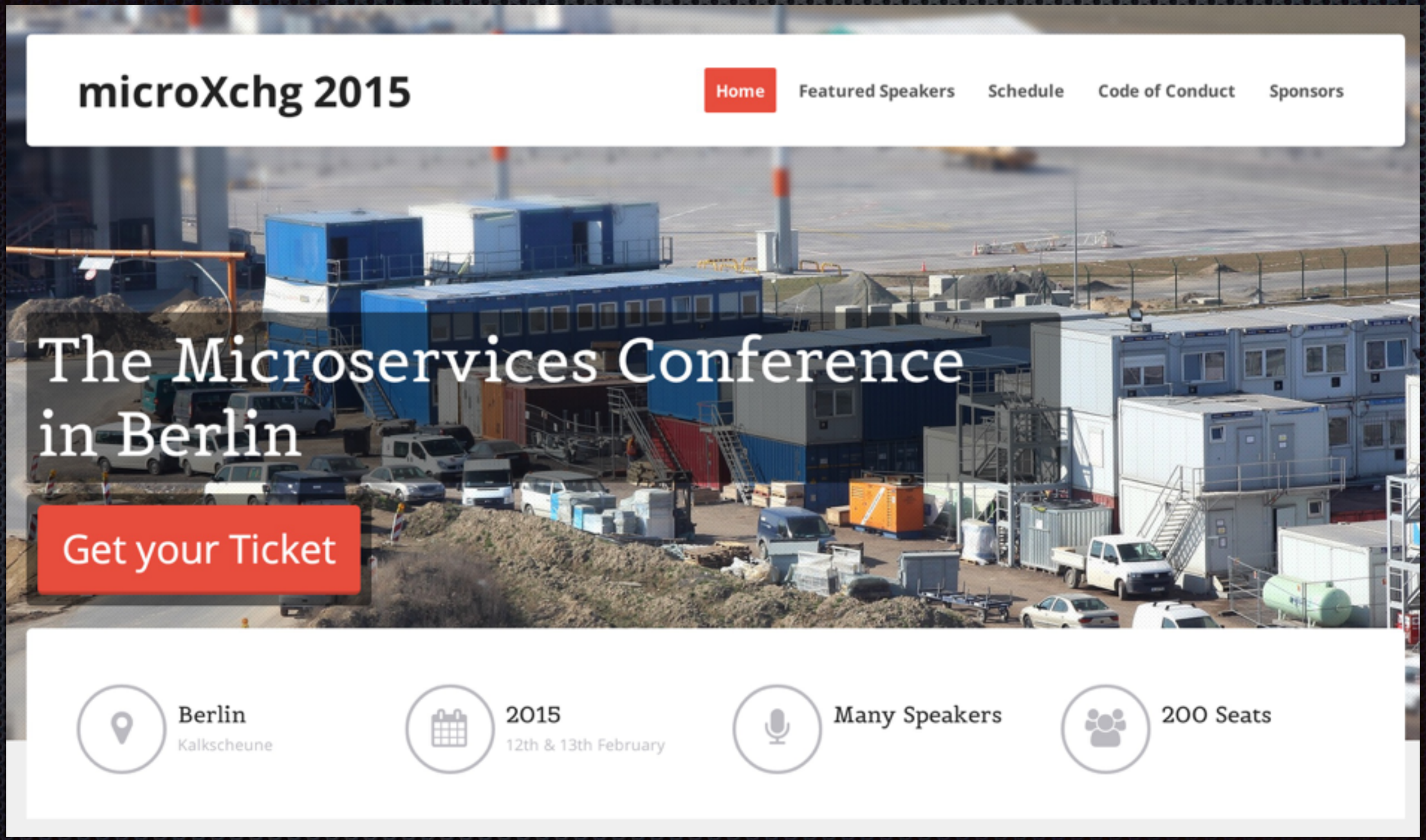
Conferences / Meetups Starting...



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Challenge 6-n

What is a MicroService?

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Taxonomy May be Useful (before it's too late)

- Synchronicity
  - Primary API access to service
- Average size / number ratio of services
  - Zones for clarity of labeling
- DB / service ratio
  - Expose potential hinderances to rapid deployment

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