Microservices and Sticky Notes, Game On!

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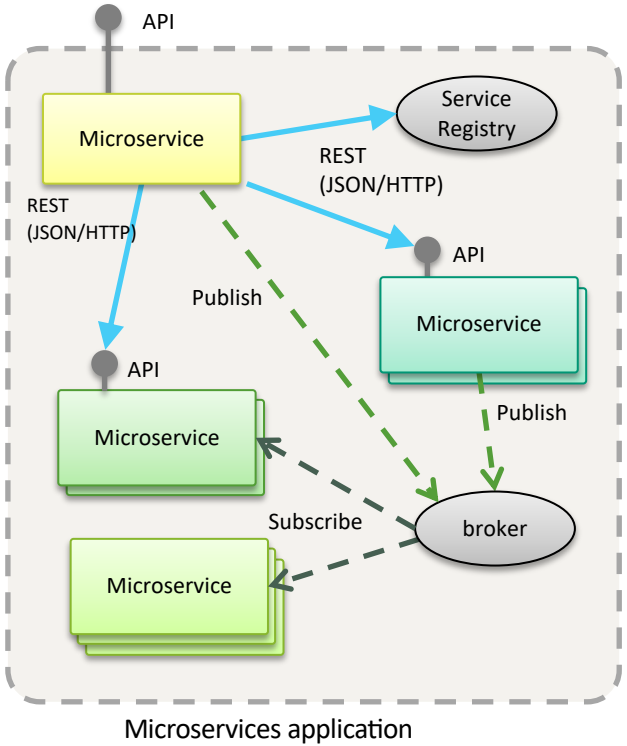
Microservices are used to…

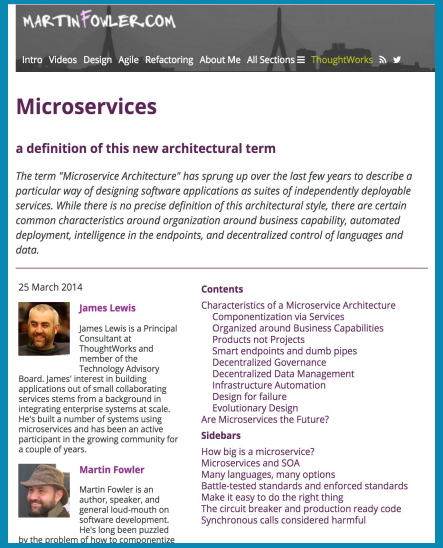
- compose a complex application using
  - “small”
  - independent (autonomous)
  - replaceable
  - processes

- that communicate via
  - language-agnostic APIs



Conway’s law

Bounded Contexts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Microservices

a definition of this new architectural term

The term "Microservice Architecture" has sprung up over the last few years to describe a particular way of designing software applications as suites of independently deployable services. While there is no precise definition of this architectural style, there are certain common characteristics around organization around business capability, automated deployment, intelligence in the endpoints, and decentralized control of languages and data.

25 March 2014

James Lewis

James Lewis is a Principal Consultant at ThoughtWorks and member of the Technology Advisory Board. James' interest in building applications out of small collaborating services stems from a background in integrating enterprise systems at scale. He's built a number of systems using microservices and has been an active participant in the growing community for a couple of years.

Martin Fowler

Martin Fowler is an author, speaker, and general loud-mouth on software development. He's long been puzzled by the problem of how to componentize

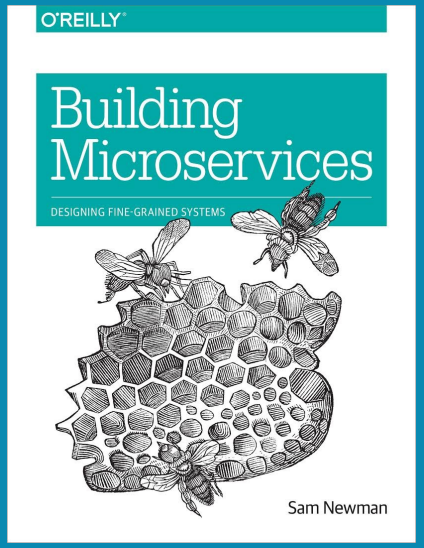
Contents

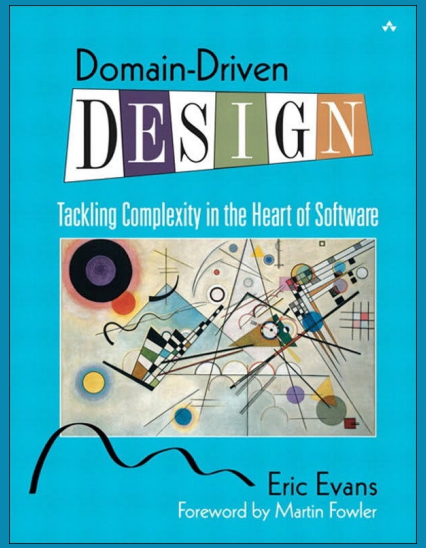
Characteristics of a Microservice Architecture
- Componentization via Services
- Organized around Business Capabilities
- Products not Projects
- Smart endpoints and dumb pipes
- Decentralized Governance
- Decentralized Data Management
- Infrastructure Automation
- Design for failure
- Evolutionary Design

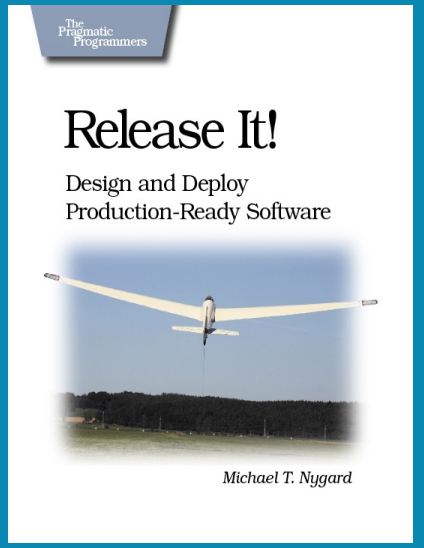
Are Microservices the Future?

Sidebars

How big is a microservice?
Microservices and SOA
Many languages, many options
Battle-tested standards and enforced standards
Make it easy to do the right thing
The circuit breaker and production ready code
Synchronous calls considered harmful







Eventual consistency

DevOps

Automation

Testing?

Microservices Sample Apps…

- Create a single service

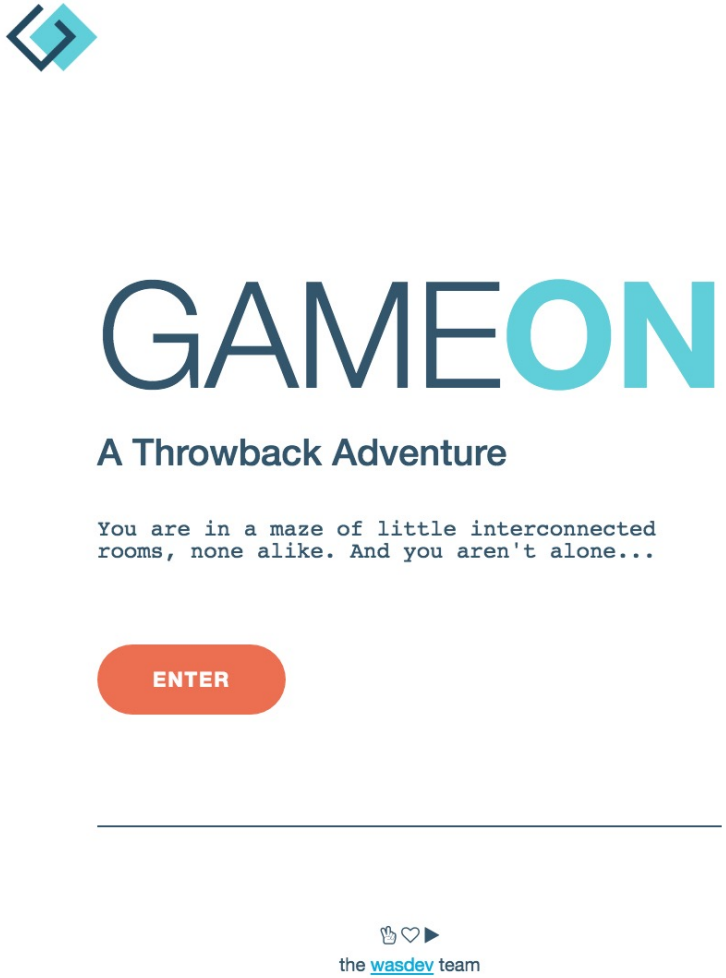
Build an API for r ld
www.javaworld.com/.. tml ▾ JavaWorld ▾
Jul 21, 2015 - While mo based ... If you
have not imported the s

- Rebuild a pre-baked micr

Microservices Online Store Sample Application using Bluemix
https://developer.ibm.com/bluemix/.../**sample**-application-using-**microservices**-bluemi... ▾
Mar 16, 2015 - A **microservices** e-commerce **sample** application using Node.js, Liberty
Java JAX-RS, PHP and hosted on Bluemix.

The premise …

- Hands on with microservices
- Stick with ’Hello World’ simplicity
- Choose your own adventure
- Fast path to the hard stuff
- Build something cool (to you!)
- Learn as you go



connected: validating JWT
enter The First Room

Welcome to The First Room

The First Room

You've entered a vaguely squarish room, with walls of an indeterminate color.

TL;DR README (The extended edition is here):

- Commands start with '/'.
- Use `/help` to list all available commands. The lis
- Use `/exits` to list all available exits.
- Use `/sos` to return to First Room if you're stuck.
- Rooms might try to fool you, but these three commands will always work.

Retro, text-only interface

Simple text commands

</> /go N

GameOn! Map
About
Tools
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POI List
MicroProfile
Search
Game On! Map
Sweep Map
Points of Interest
Rooms
My Rooms
Simple Rooms
The Tall
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A Unique
AustinNor
GarethSim
HealthCen
BobRoom
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RossTestR
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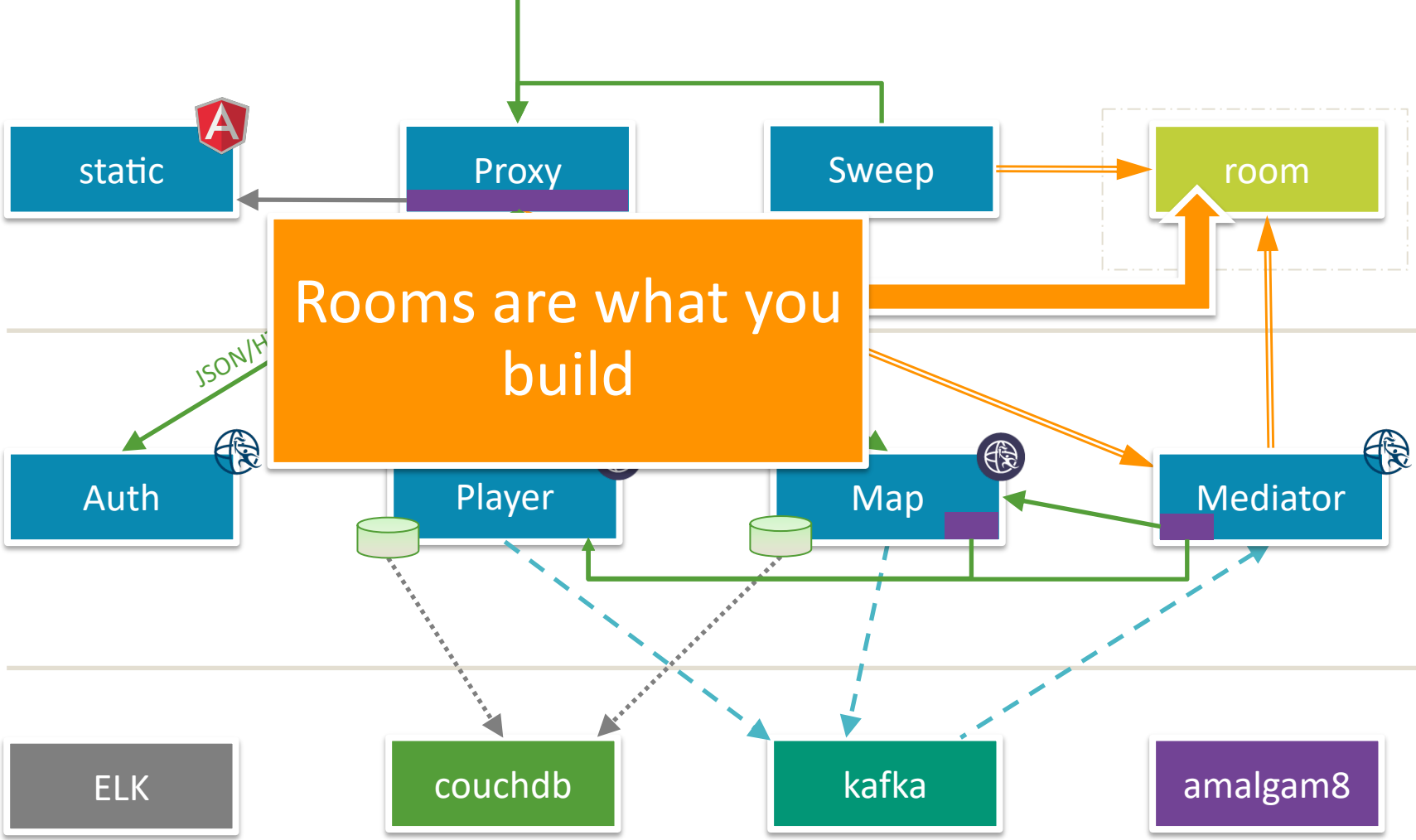
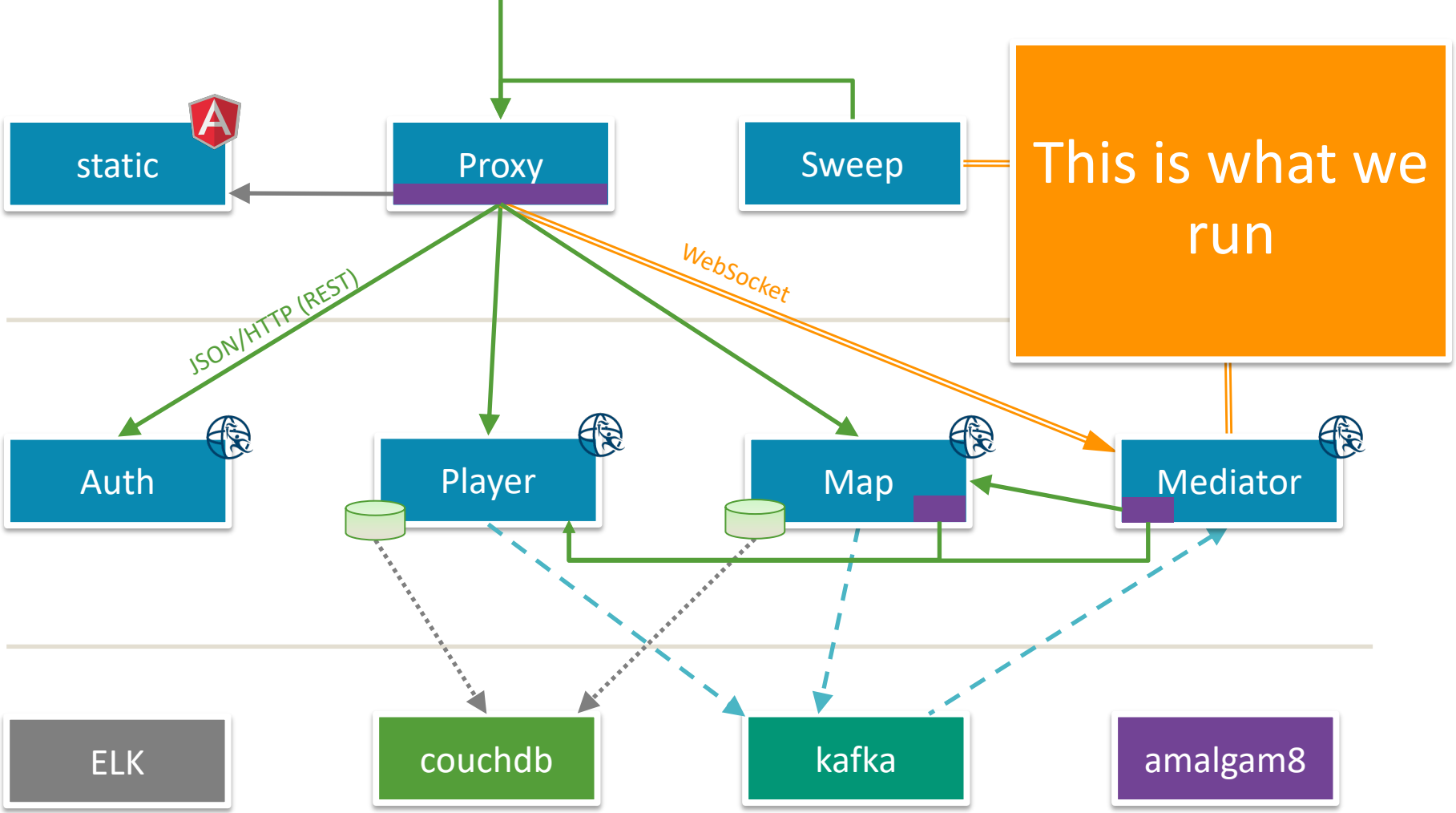

static
Proxy
Sweep
room
Rooms are what you build
JSON/H
Auth
Player
Map
Mediator
ELK
couchdb
kafka
amalgam8


static
Proxy
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This is what we run
JSON/HTTP (REST)
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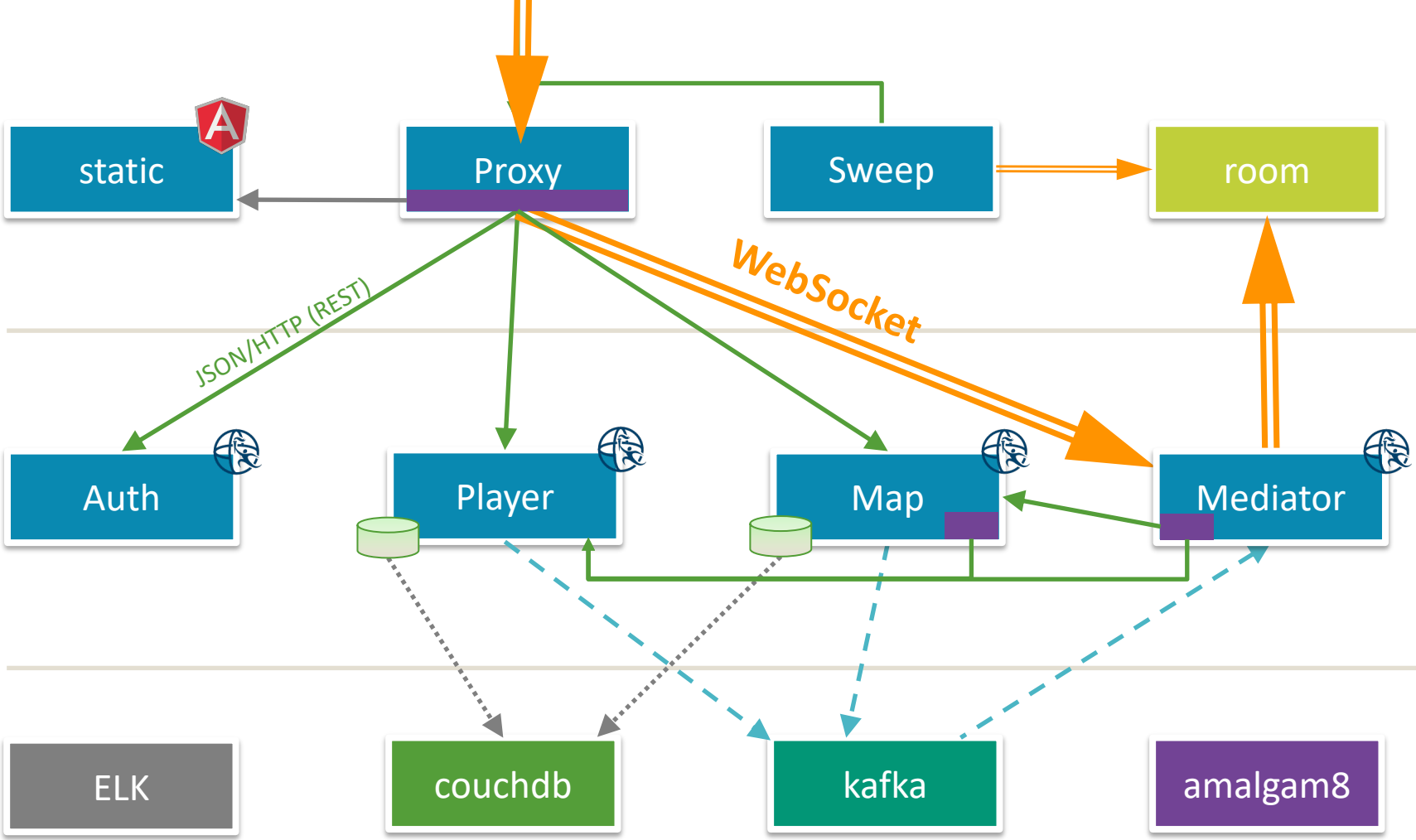
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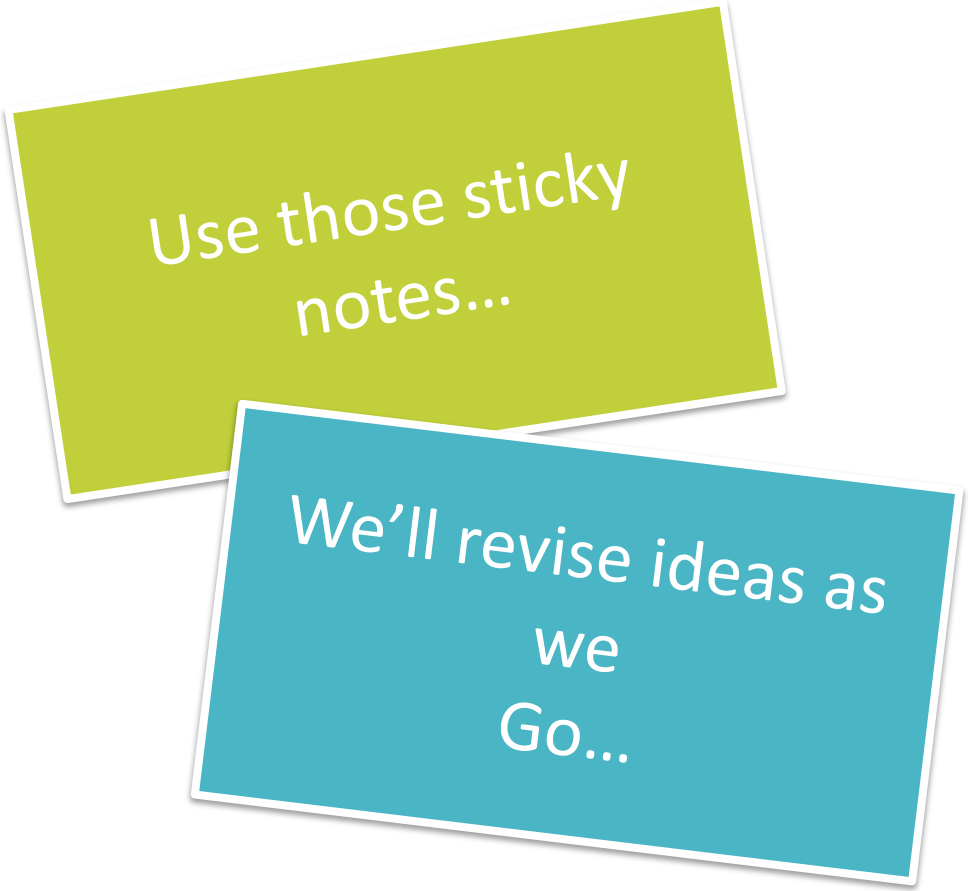
Let’s go!

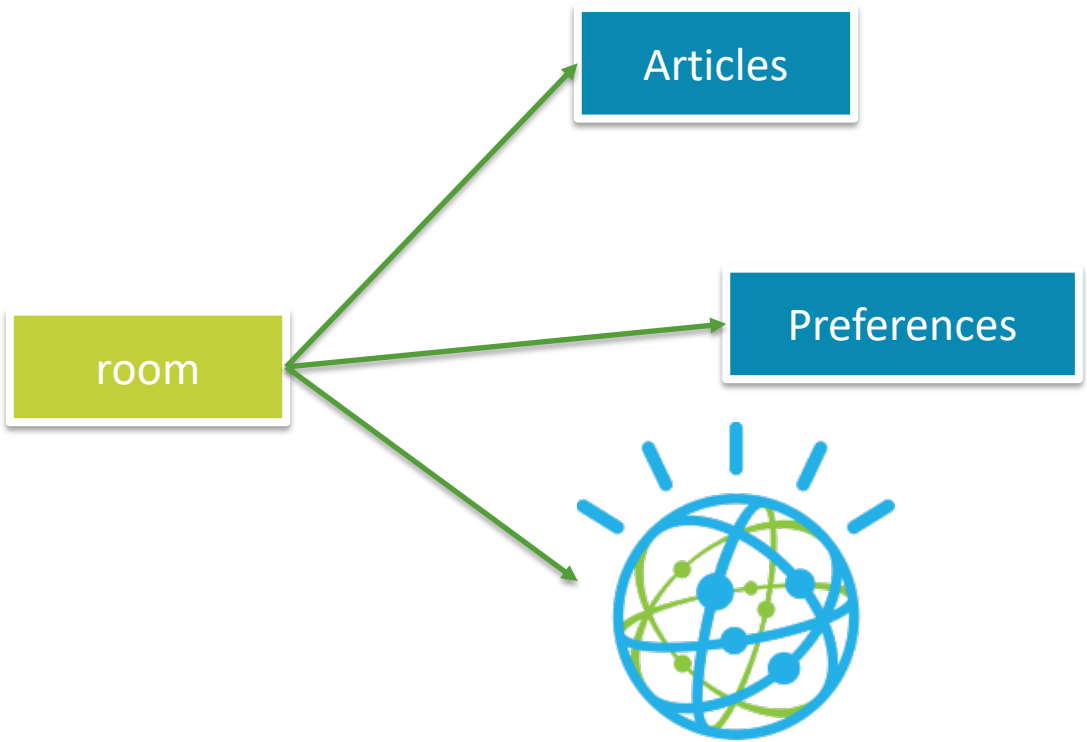
Create a room (this is just the beginning…)

- Collect around a table
- Grab some markers and post-its

- Devise a “room” for the game:
  - Static / Dynamic?
  - Commands?
  - Items?



Room as a set of services…



Example rooms

- Map room
- Weather room
- IoT devices
  - Secure Gateway + device control
  - Secure Gateway + camera
- Quiz before being allowed to exit
- Puzzle
- Language
  - Censor room (no bad words allowed!)
  - Translation room
  - Media bias
- Auction
  - Items, bids, winners
- Bulletin board
  - Current news (read vs. unread)
- MUD-style tavern

About those other services…

Fallacies of distributed computing

- The network is reliable
- Latency is zero
- Bandwidth is infinite
- The network is secure
- Topology doesn’t change
- There is one administrator
- Transport cost is zero
- The network is homogenous

-- L Peter Deutsch, 1994

https://en.wikipedia.org/wiki/Fallacies_of_distributed_computing

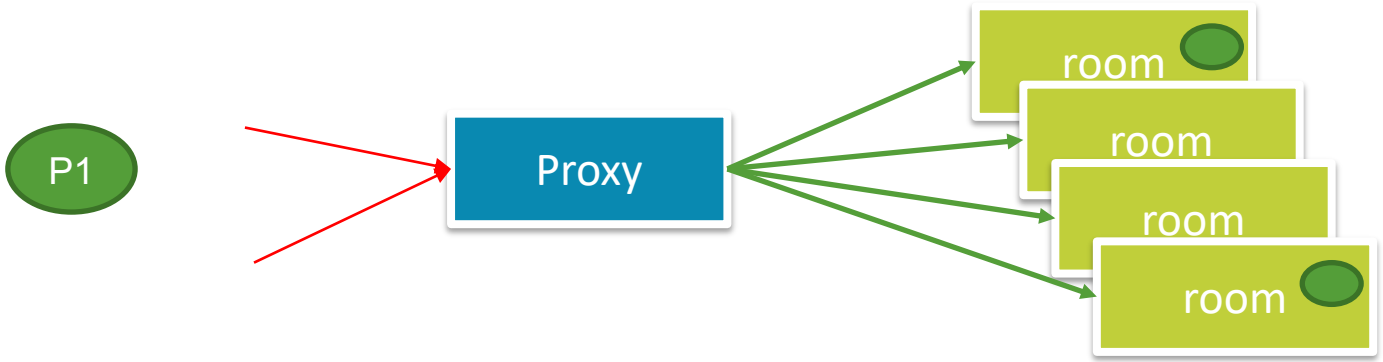
Calling other services

- How are you going to handle latency?
- How do you handle unresponsive services?

Most popular room ever!

Scale the service…

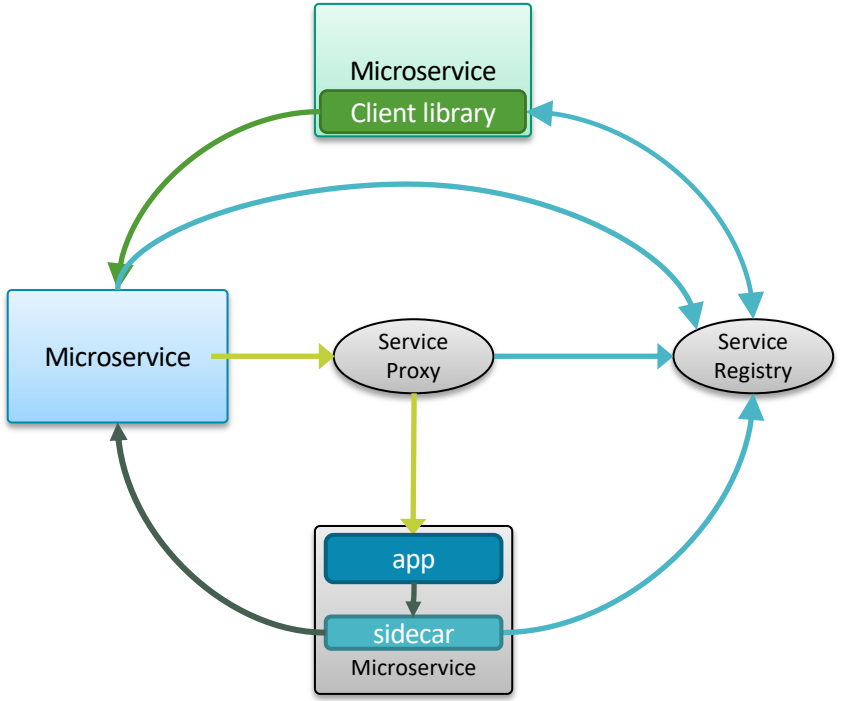
- How do players chat with each other?
- How do you know what players are in your room?
- Is there in-memory state that needs to be managed differently?



Service registration and discovery

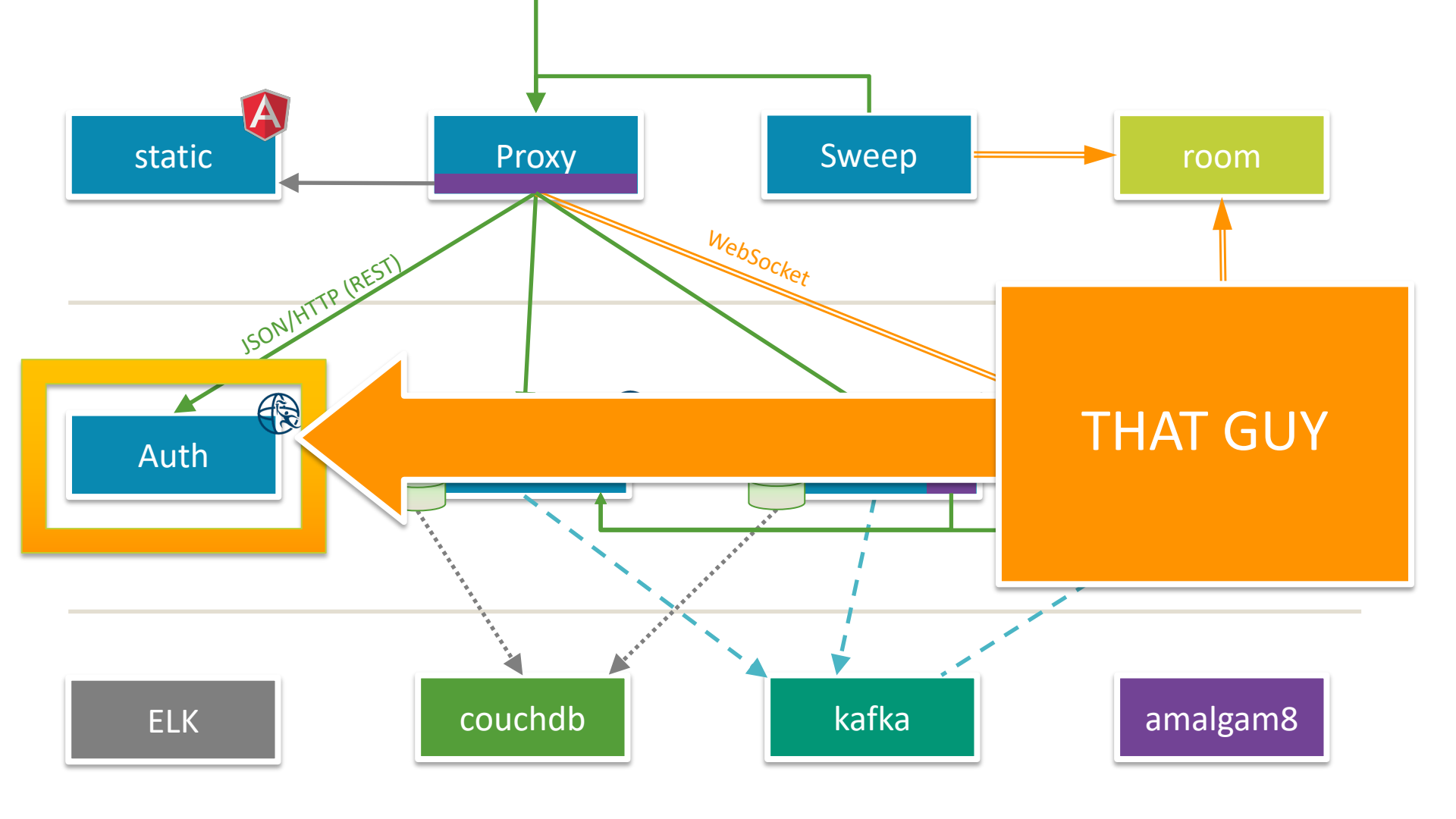
- Required for load balancing and scaling
- Services need to find each other
- Environment changes constantly

- Client-side or server-side?
- Client library, sidecar, or proxy?



TEST!!

- Unit test
- Contract test
- End to end test
  - Synthetic transactions
- ….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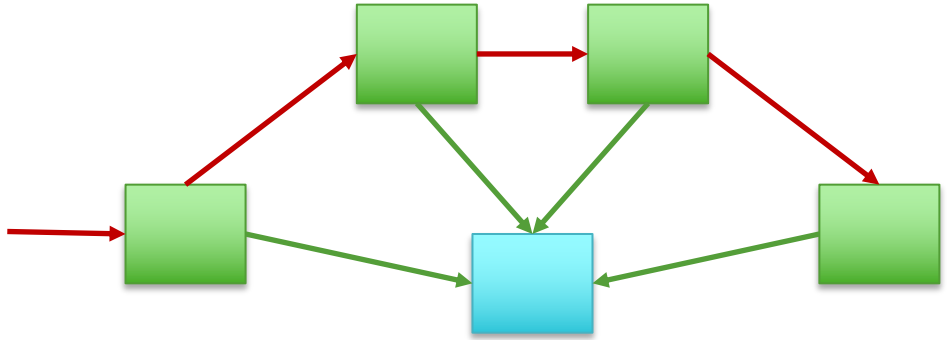
Security

- Authentication
- Authorization
- Identity propagation
- Credential revalidation and expiry

Balanced against…

- Latency
- Contention



Thank You!

Play – **http://game-on.org**

Learn more – http://book.game-on.org

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Tom Banks | tom.banks@uk.ibm.com | @tom_will_banks