ThoughtWorks®

Hola!

MICRO SERVICES ARCHITECTURE

South Sound Developers User Group Olympia, Washington March 13, 2015

MY FIRST CONTROLLER CLASS

```
[Authorize]
[InitializeCimpleMembership]
public class AccountController : Controller
                                | GIT: /Account/Lugin
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| GIT: 
                                                                      // If we got this far, samething failed, redisplay form
ModelState.Ad9ModelFrere("", "The user mass or password provided is incorrect.");
return Valendook];
                         string ownerAccount = GluthhibbCourity.GetUserHame(provider, providerUserId);
NanageWessageLCP message = null;
                                                                // Only disassociate the account if the currently logged in user is the owner if (ownerAccount == User_Identity_Name)
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                                      politic fortinencia (mange)(mangenesquici mange)

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                                                                                                                                             ff (Medalitate.Lovalid)

// ClasseDesserd will three an exception rather than return false in certain failure scenarios.

bool chalep@basserdiscoeded;
                                                   /
// If we got this far, something failed, redisplay form
return View(model);
                                                                                          ]

if (User_Identity_Lukathenticated) {

// If the curvent user is logged in add the new account 
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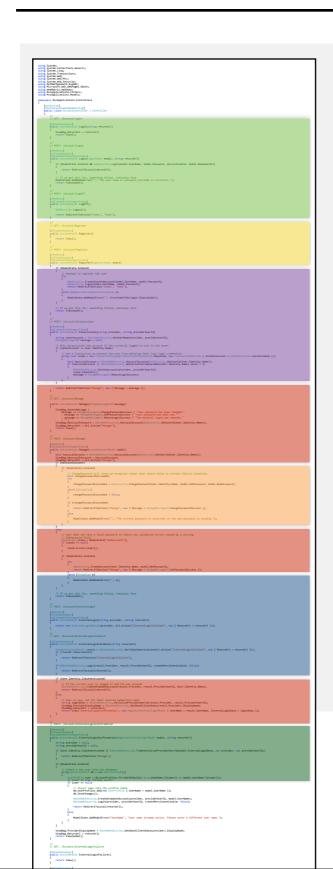
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| marked|lb user = db.ttschroffise.Firsthrodefault(s >> s.UterName.Tot.mer() >= model.ttschame.Tot.mer());
|// Cast: if user already exists
|// (user already exists
|-// (u
                                                                                                                                                                {
// Insert same into the profile table
db.UserProfiles.Add(new UserProfile { UserName = model.UserName });
db.SaveChanges();
                                                                                                                                                                                          Ourthindscurity.CreateOrigidtalcount(provider, providerGuerId, model.GuerName);
OurthindScurity.Logid(provider, providerGuerId, createPersistentCookie: false);
return RedirectToLocal(returnGr1);
                                                                Viewing.ProviderOisplayhame = Okuthwhilecurity.GetSkithClientData(provider).Displayhame;
Viewing.ReturnDcl = returnDcl;
return View(model);
```

[Allowkonymous]
public ActionNeult ExternalLoginFailure()
{
 return View();
}

MY FIRST CONTROLLER CLASS



Input validation

Authentication

Process Shopping Cart

Data Access Logic

Process Shipping Information

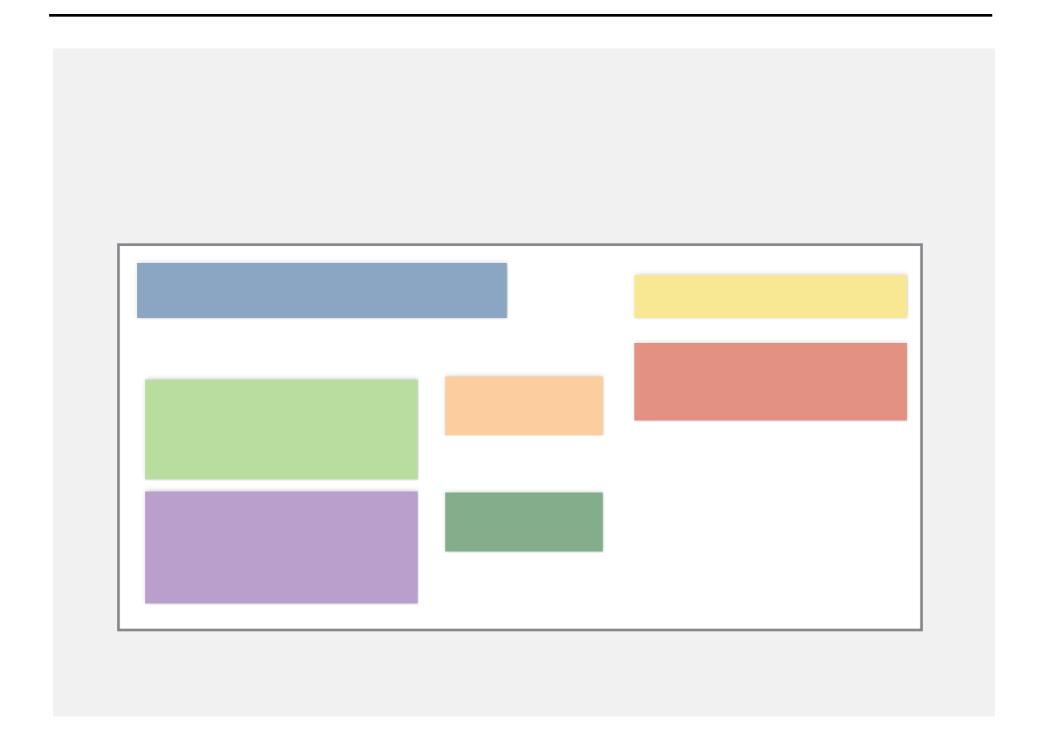
Data Access Logic

Presentation Logic

Data Access Logic Process Payments

So what's wrong with that?

MY FIRST CONTROLLER CLASS



"Good design scales up well."



- Key Traits of MSA
- Design Principles
- Walk-through
- Implementation Approach



- Technical Details
 - Messaging
 - Monitoring
 - Testing
 - Deployment



- Pros and Cons
- References
- Questions (maybe some answers)

Ready?

- Independent
 - Build
 - Deployment
 - □ Data Management
 - □ Replaceable
 - Business Domain

- ☐ SOLID Design for Distributed Systems
 - ☐ Single Responsibility
 - □ Open / Closed
 - ☐ Liskov Substitution
 - ☐ Interface Segregation
 - Dependency Inversion
- Unix Philosophy

- Robust
 - ☐ Loosely Coupled
 - Decentralized
 - ☐ Stateless
 - ☐ Asynchronous
 - ☐ Self Monitoring

- Agile
 - ☐ Fast cycle time
 - ☐ Focused on value
 - ☐ Responsive to change
 - ☐ Emergent design
 - ☐ Short feedback loop on value
 - ☐ Easier to experiment

Conway's Law:

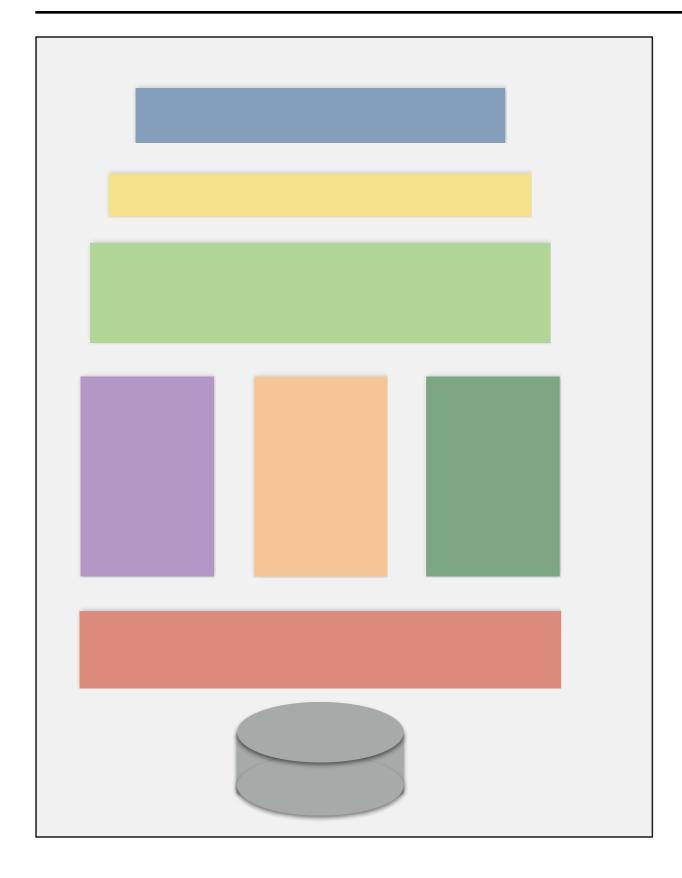
"Organizations which design systems ...

are constrained to produce designs

which are copies of the communication

structures of these organizations"

THE MONOLITH



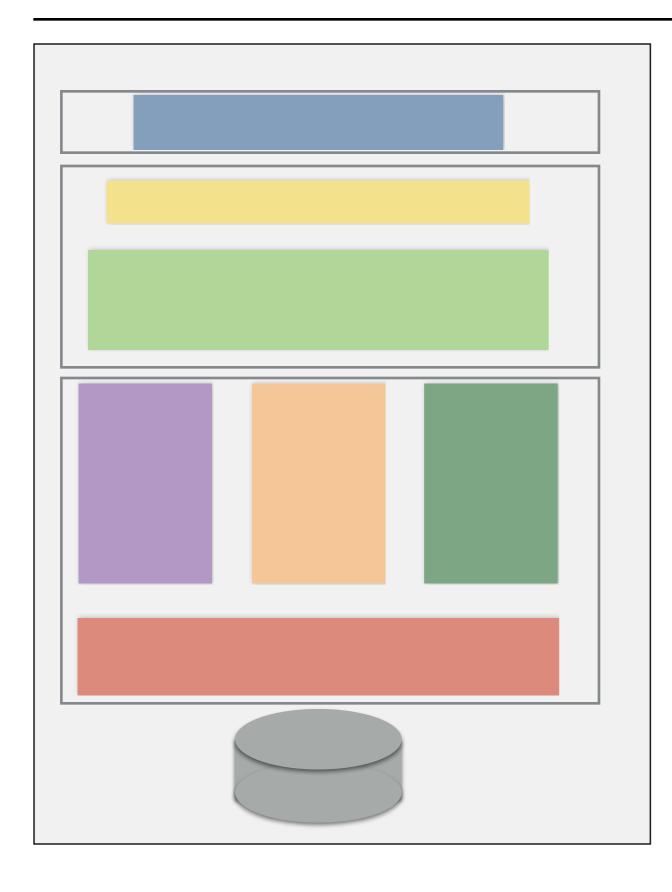
Better?

- Separation of concerns
- □ Testable
- Stable

But...

- Changes require full re-deploy
- Still somewhat coupled
- Large codebase harder to keep organized

SERVICES - THE SAGA BEGINS



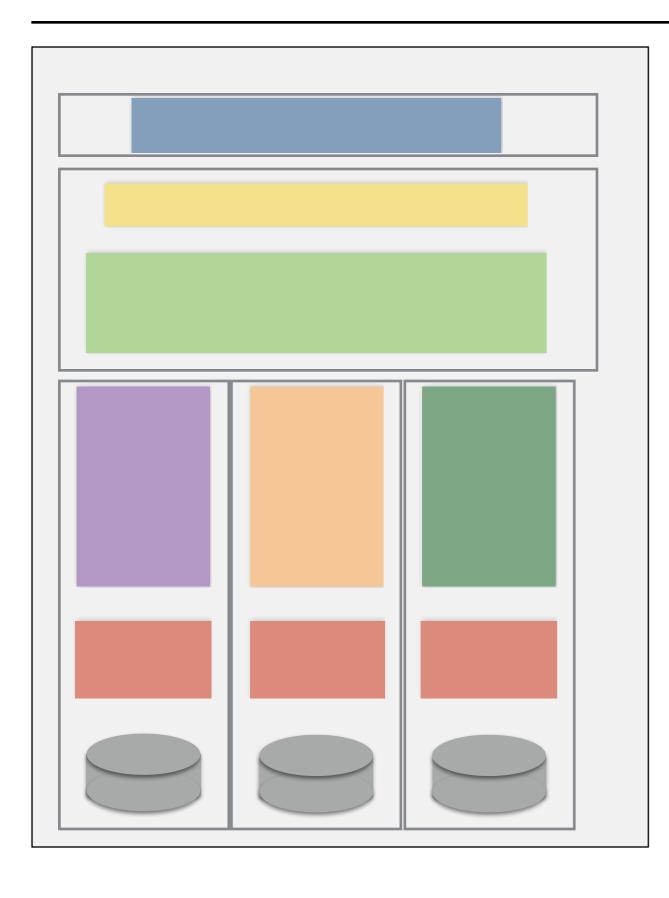
Better?

- Independently deployable
- Testable
- Stable

But...

- Contracts and Versioning
- ☐ Centralized Database Sql hell
- Transactions and Concurrency
- Latency

SERVICES - THE SAGA CONTINUES



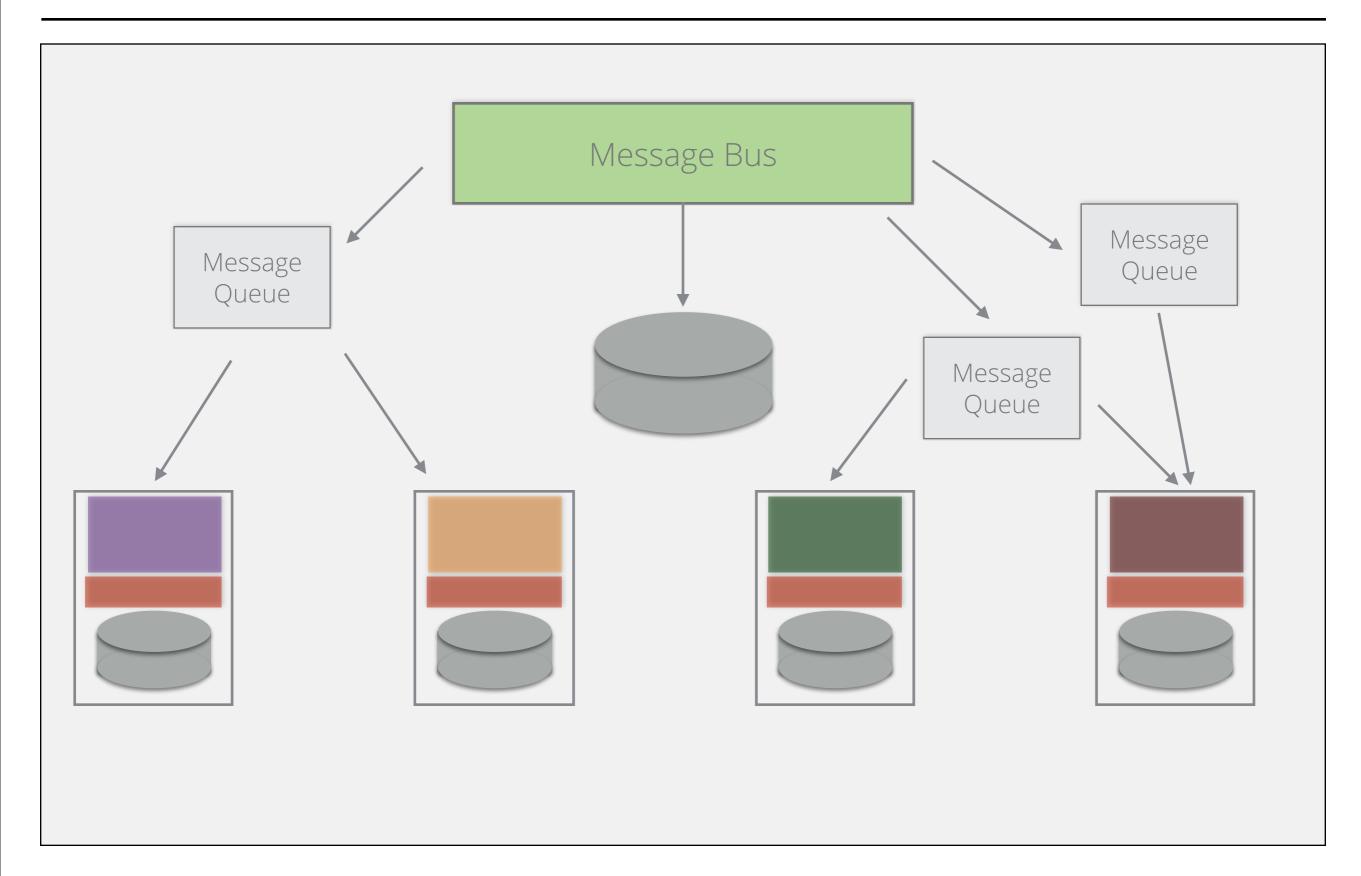
Better?

- Independently deployable
- Testable
- Stable

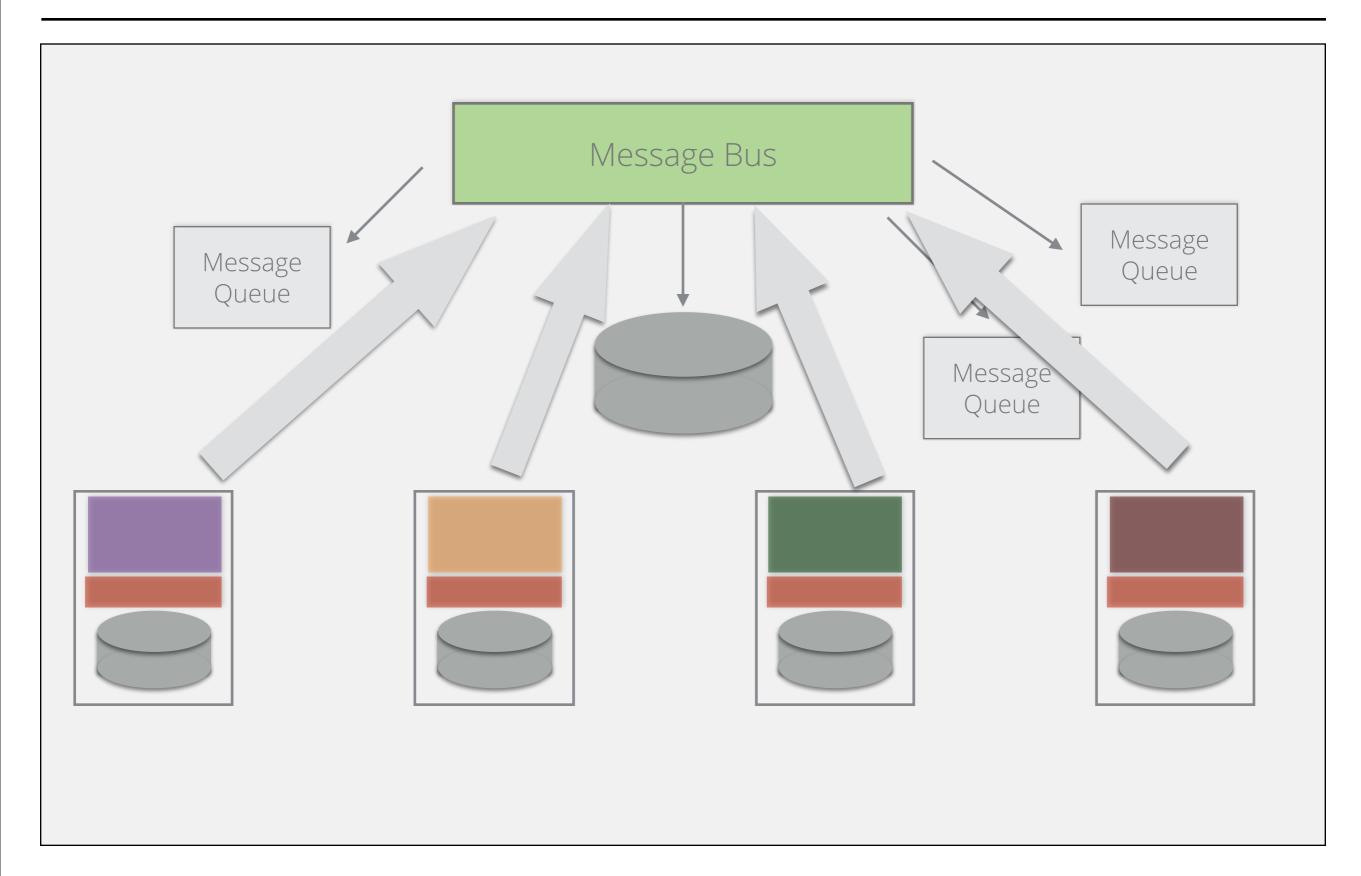
But...

- Contracts and Versioning
- Orchestration
- DB Synchronization
- Services still somewhat coupled

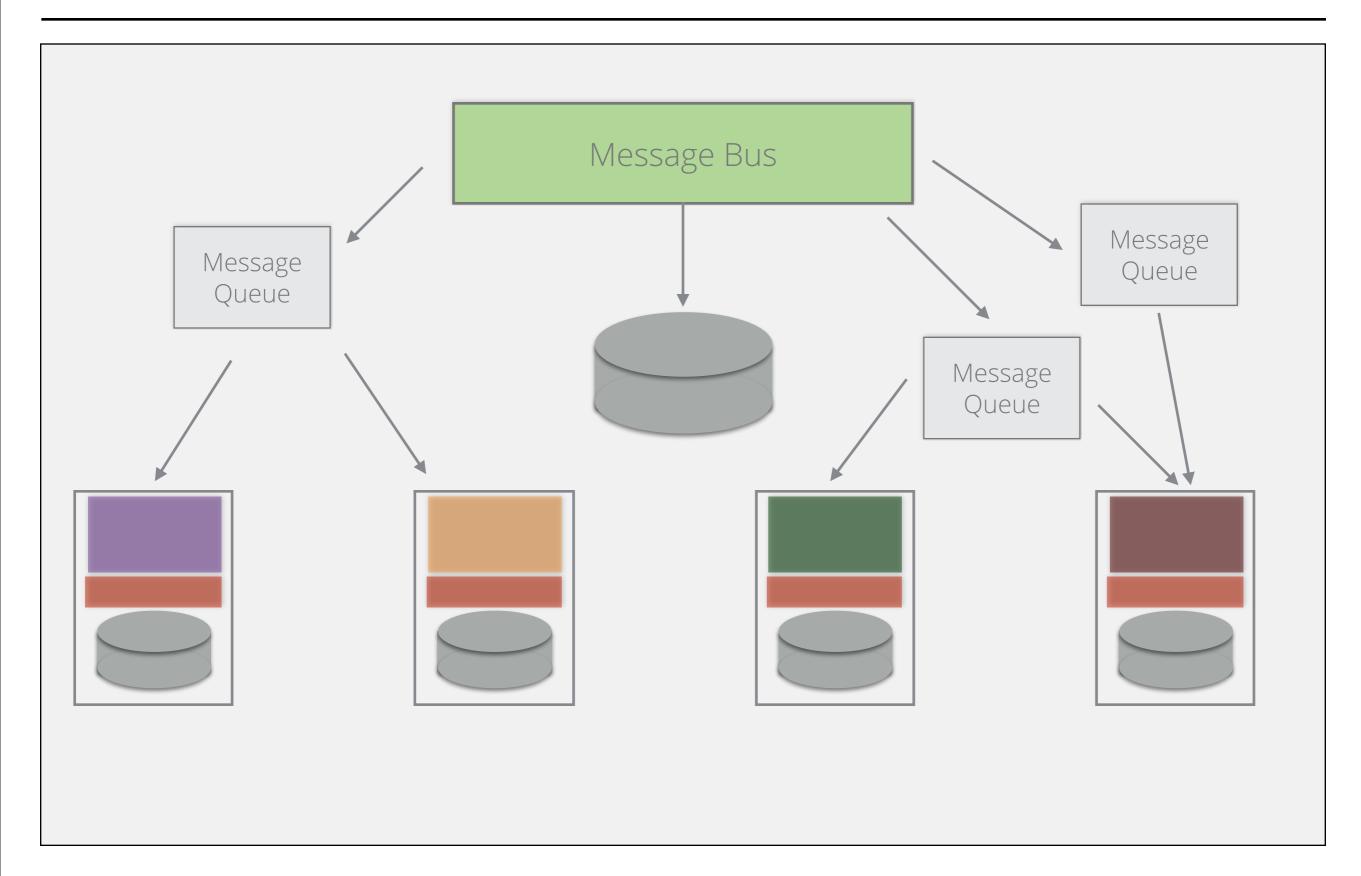
A STEP FURTHER...



A STEP FURTHER...



A STEP FURTHER...



MESSAGING

- Report Everything
 - You never know what might be interesting
- Expire messages
- Generous Contracts are generous
- Queues and Listeners
- Async
- ☐ Fault tolerant

MONITORING

- Decentralized and async nature means monitoring is important
- Monitor thyself
- Fail loudly
- Performance metrics
- Business metrics
- Session Tracking
- Security Logging

TESTING

- Small services make unit testing nice
- Async nature and messages make end to end testing less relevant
- Fault tolerance and intense monitoring boosts confidence in releasing
- Regression testing?
- A/B Testing and experiments?

DEPLOYMENT

- Continuous Integration / Continuous Delivery
- Frequent releases
- Low Ceremony
- No "flipping switches"

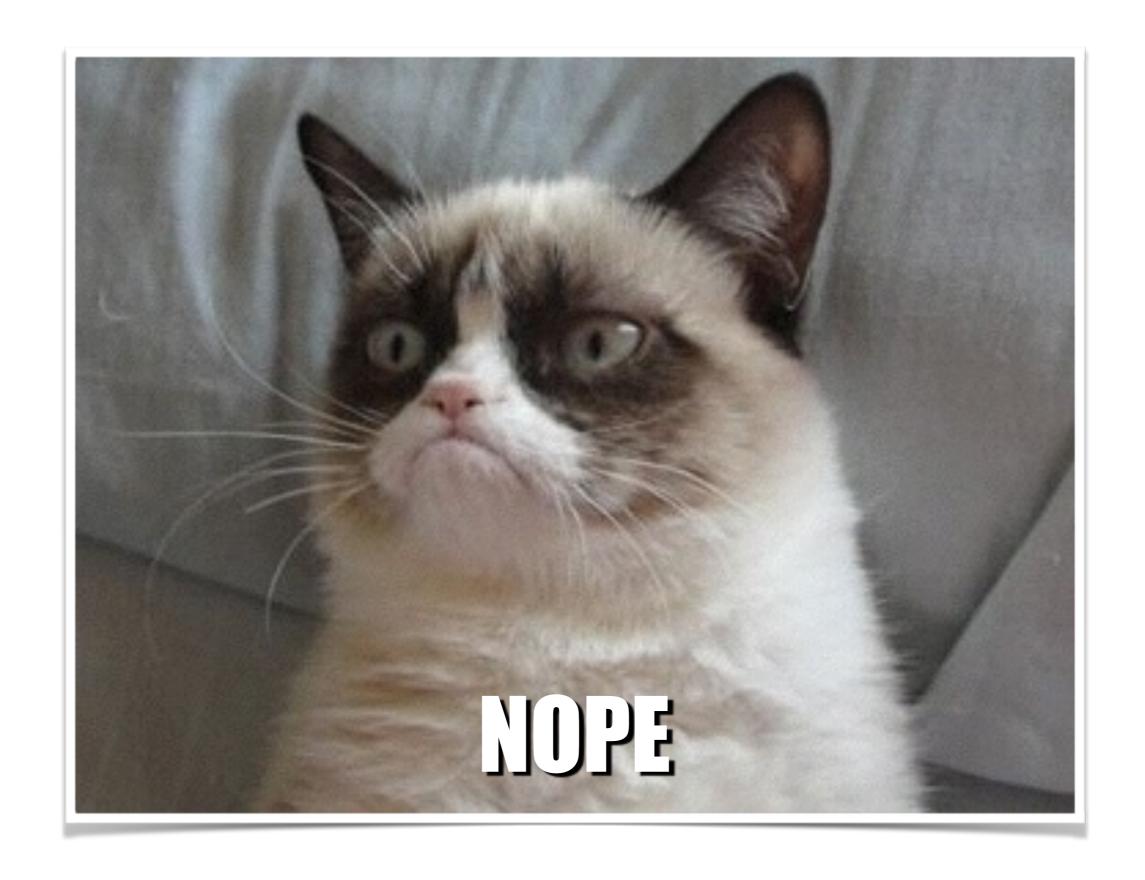
PROS

- Robust
- Simple
- Scalable
- Testable
- Composition of systems
- Easy to change
- Easy to replace
- Easy to deploy

PROS

- Language agnostic
- Platform agnostic
- Framework agnostic
- ☐ You're not locked in to legacy code!

"I get it, Micro Services is a Silver Bullet!"





- Requires robust monitoring
- More services to keep track of
- Not an intuitive mental model...yet
- Finding domain boundaries may take trial and error

REFERENCES

- Martin Fowler's article:
 - http://martinfowler.com/articles/microservices.html
- ☐ James Hughes:
 - http://yobriefca.se/blog/2013/04/29/micro-servicearchitecture/
- ☐ Fred George:
 - OreDev video: https://vimeo.com/79866979
- □ also, the google knows

THANKYOU

Questions?

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