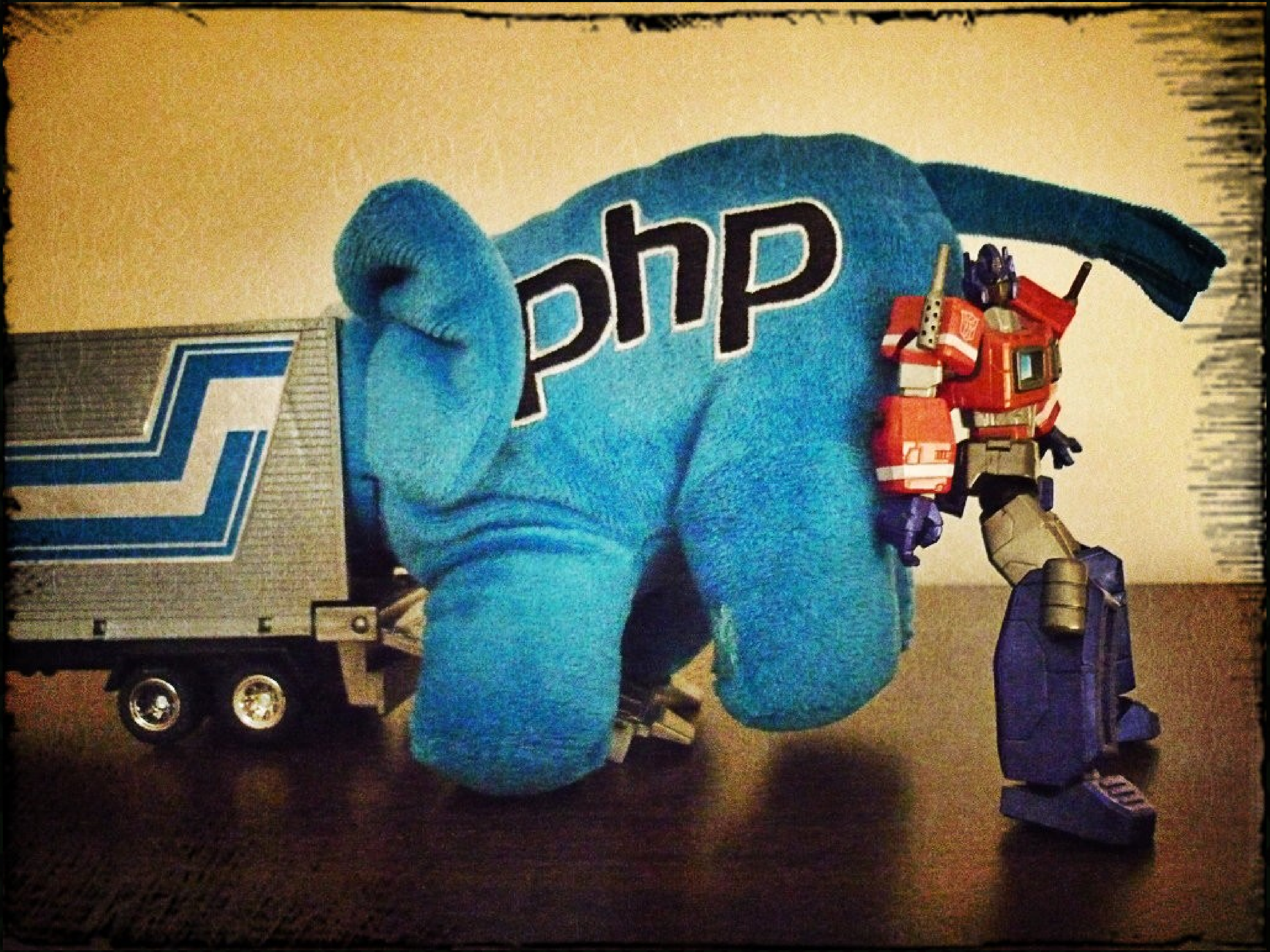
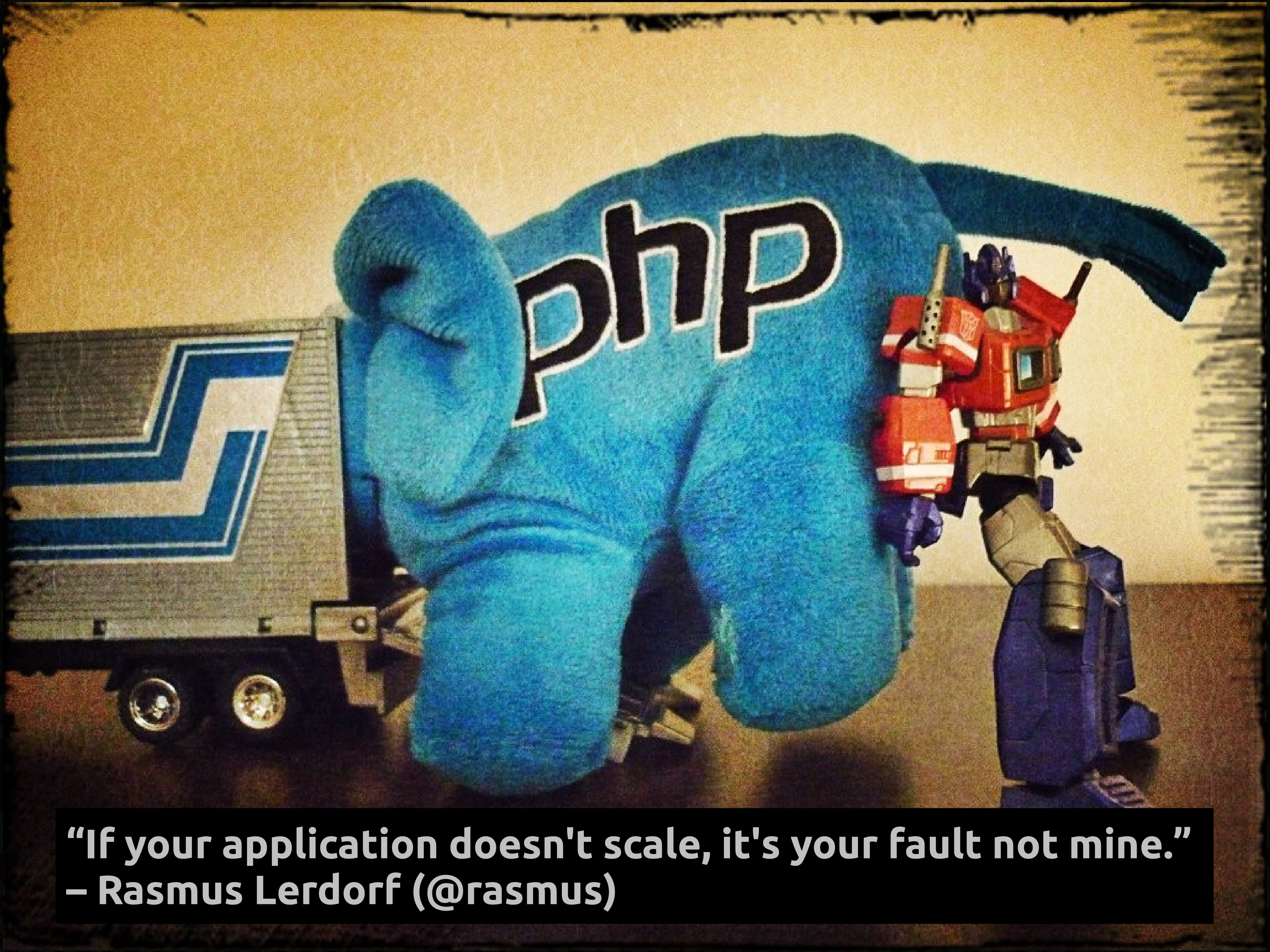
Sensible Scaling



Rowan Merewood



"If your application doesn't scale, it's your fault not mine."
– Rasmus Lerdorf (@rasmus)

Who?

Who?

- @rowan_m

Who?

- @rowan_m
- Software Engineer & Team Lead

Who?

- @rowan_m
- Software Engineer & Team Lead
- @ibuildings & @techportal

Why?

Why?

- I've built small apps

Why?

- I've built small apps
- and pretty large ones

Why?

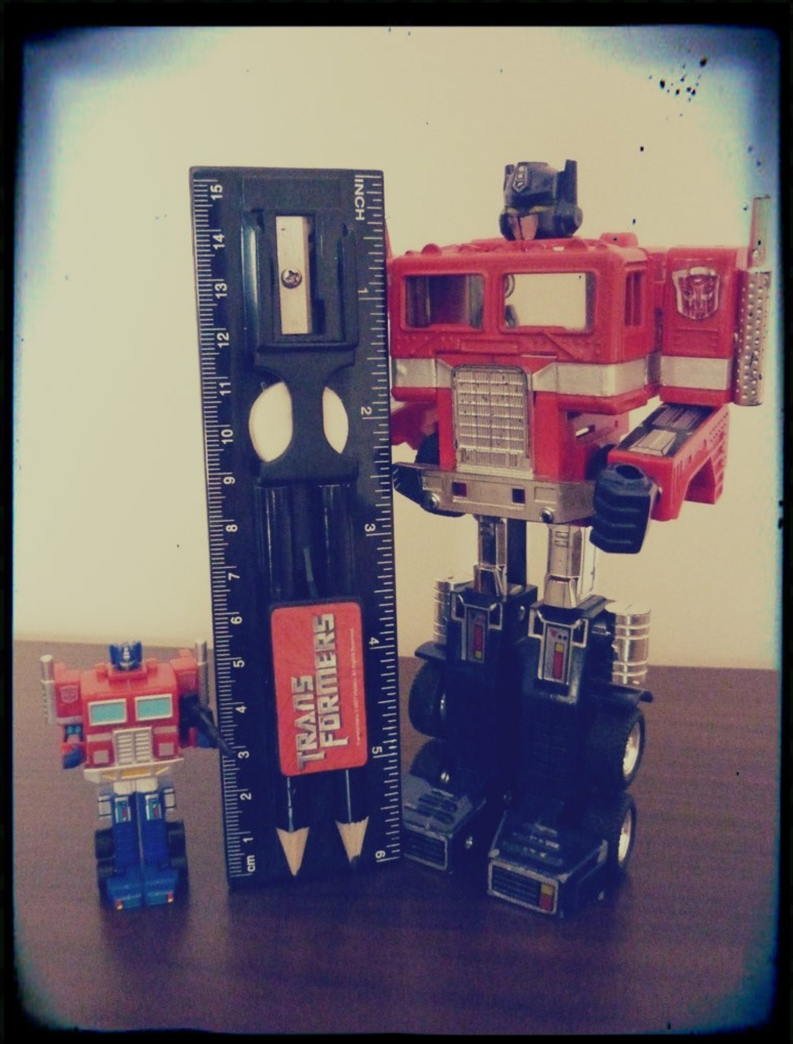
- I've built small apps
- and pretty large ones

- I've seen massive over-engineering

Why?

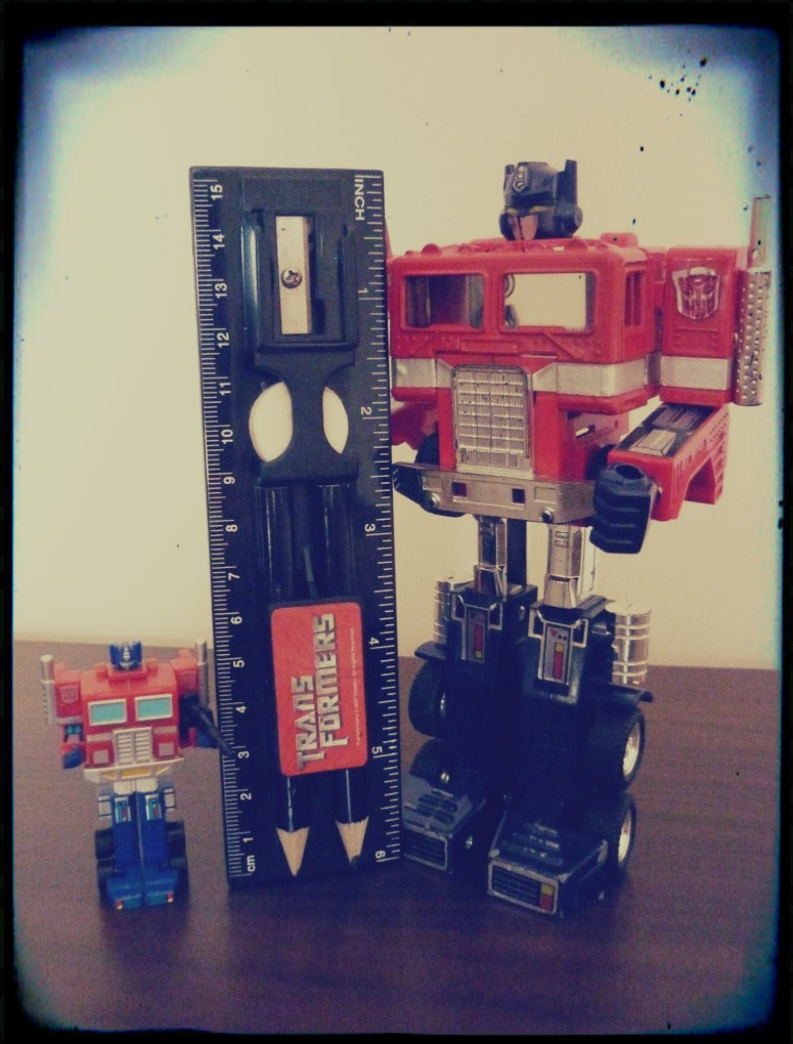
- I've built small apps
- and pretty large ones
- I've seen massive over-engineering
- and platforms that cannot scale

TDD Principles



TDD Principles

- Write **only** enough code to pass the test



TDD Principles

- Write **only** enough code to pass the test
- Do not over-engineer

TDD Principles

- Write **only** enough code to pass the test
- Do not over-engineer
- Don't give away work for free!

Build for now

Build for now

- Don't be afraid to throw code away

Build for now

- Don't be afraid to throw code away
- XP's spikes

Build for now

- Don't be afraid to throw code away
- XP's spikes
- Take advantage of current tech. without tying yourself to it

Who are your users?

Who are your users?

- Lots of short visits?

Who are your users?

- Lots of short visits?
- Anonymous or session-based?

Who are your users?

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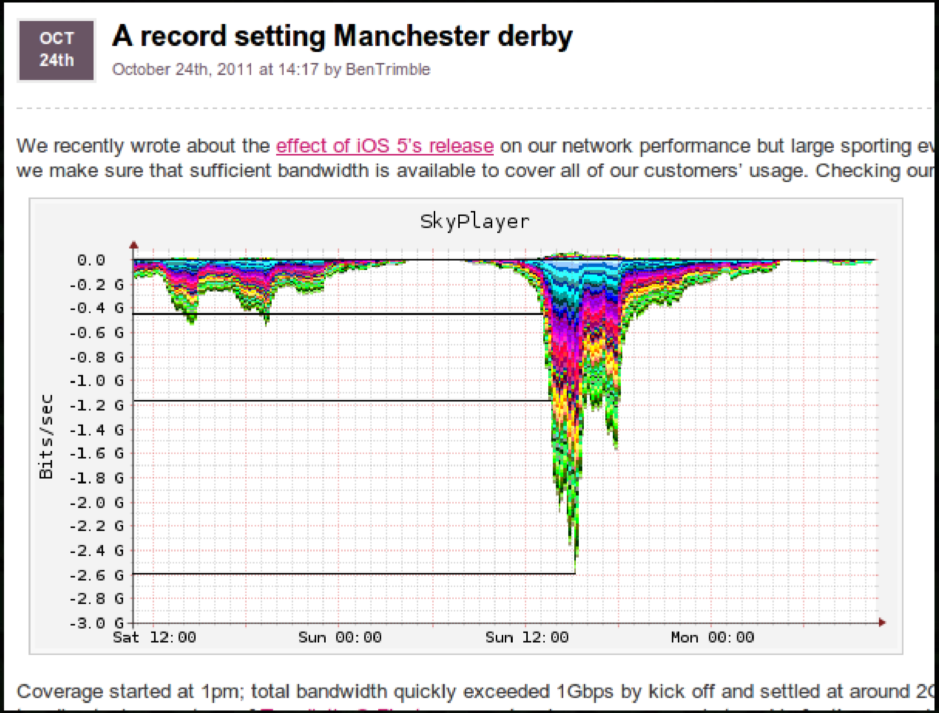
- Anonymous or session-based?
- Long, complex interactions?

Who are your users?

- Lots of short visits?
- Anonymous or session-based?
- Long, complex interactions?
- Subscribers or free users?

Monitor and Analyse



OCT 24th

A record setting Manchester derby

October 24th, 2011 at 14:17 by BenTrimble

We recently wrote about the effect of iOS 5's release on our network performance but large sporting ev
we make sure that sufficient bandwidth is available to cover all of our customers' usage. Checking our

Coverage started at 1pm; total bandwidth quickly exceeded 1Gbps by kick off and settled at around 2(

http://community.plus.net/blog/2011/10/24/a-record-setting-manchester-derby/

Monitor and Analyse

- Predict usage patterns

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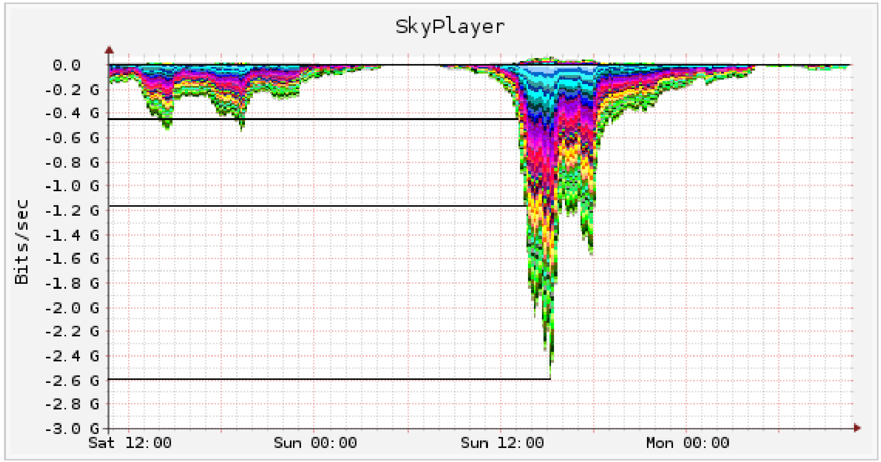

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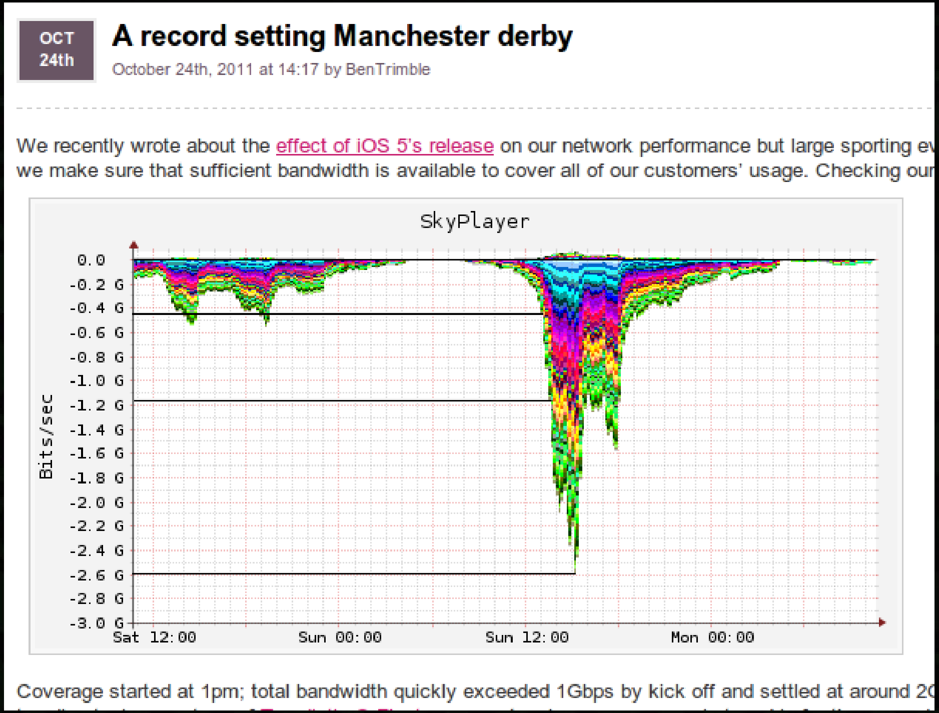

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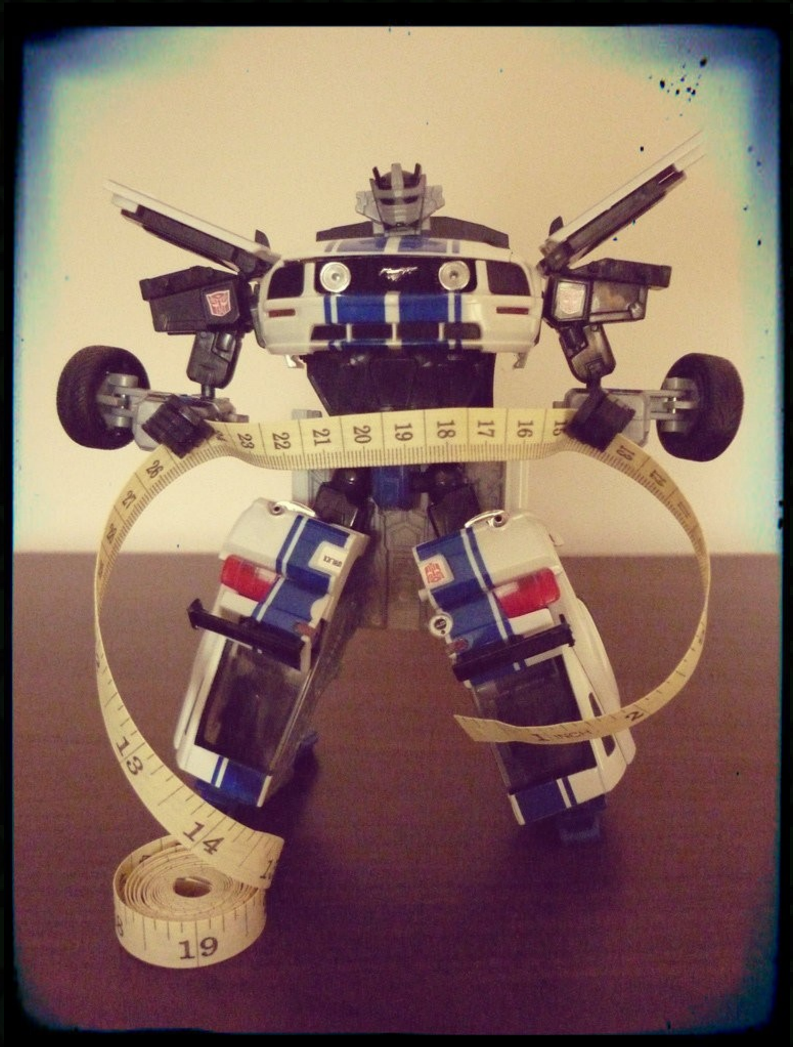
- Predict usage patterns
- Plan for peaks and troughs

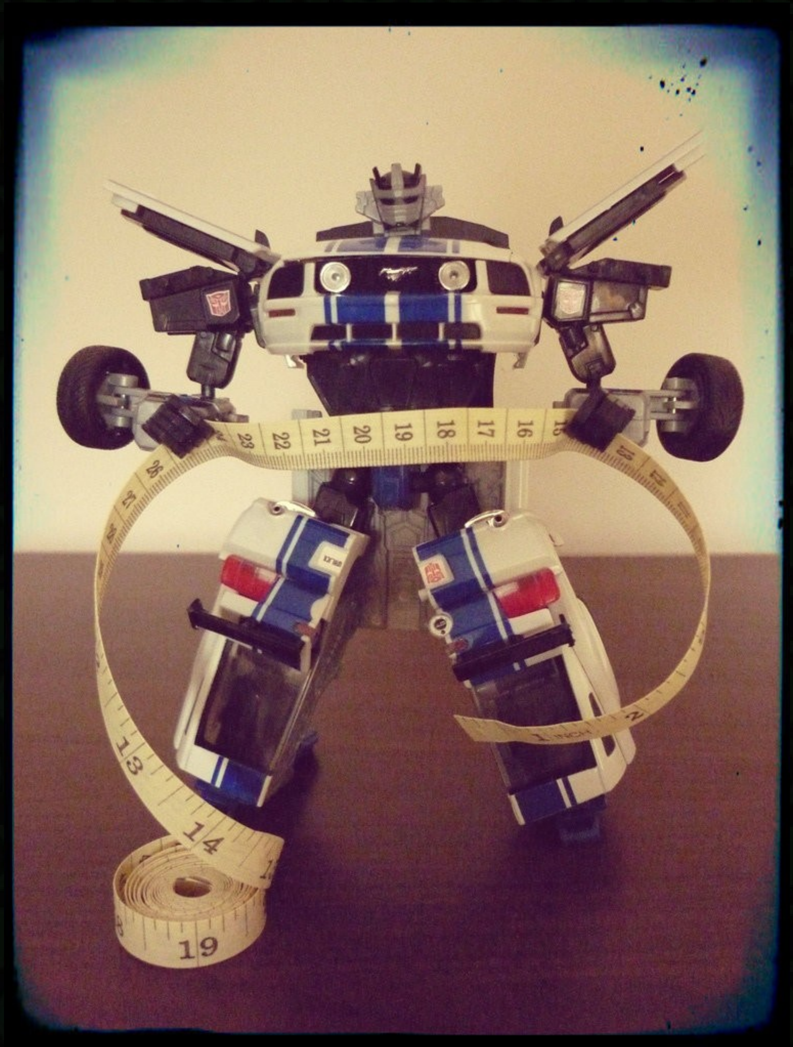
http://community.plus.net/blog/2011/10/24/a-record-setting-manchester-derby/

Profiling



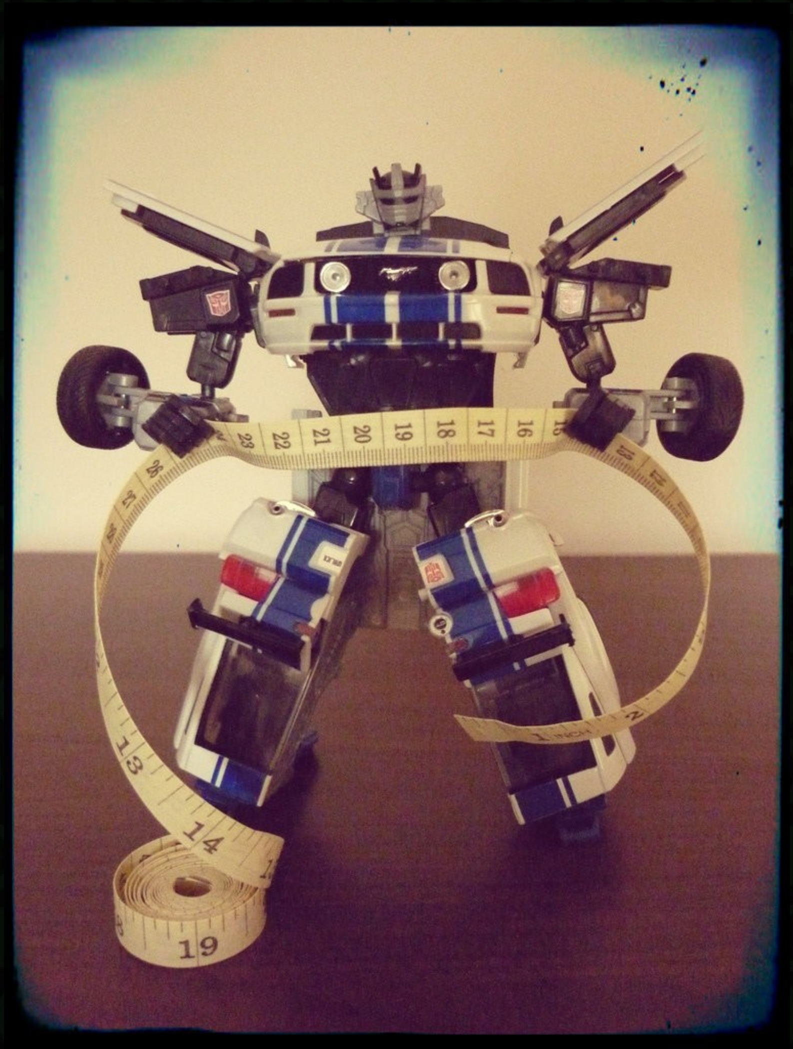
Profiling

- You do not know what is slow



Profiling

- You do not know what is slow
- Ensure you measure more than just code!



Profiling

Profiling

- PHP - Xdebug – Derick Rethans (@derickr)
  - Kcachegrind, Webgrind, etc.

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- General page display - YSlow

Profiling

- CPU Load – `top` & `/proc/loadavg`

Profiling

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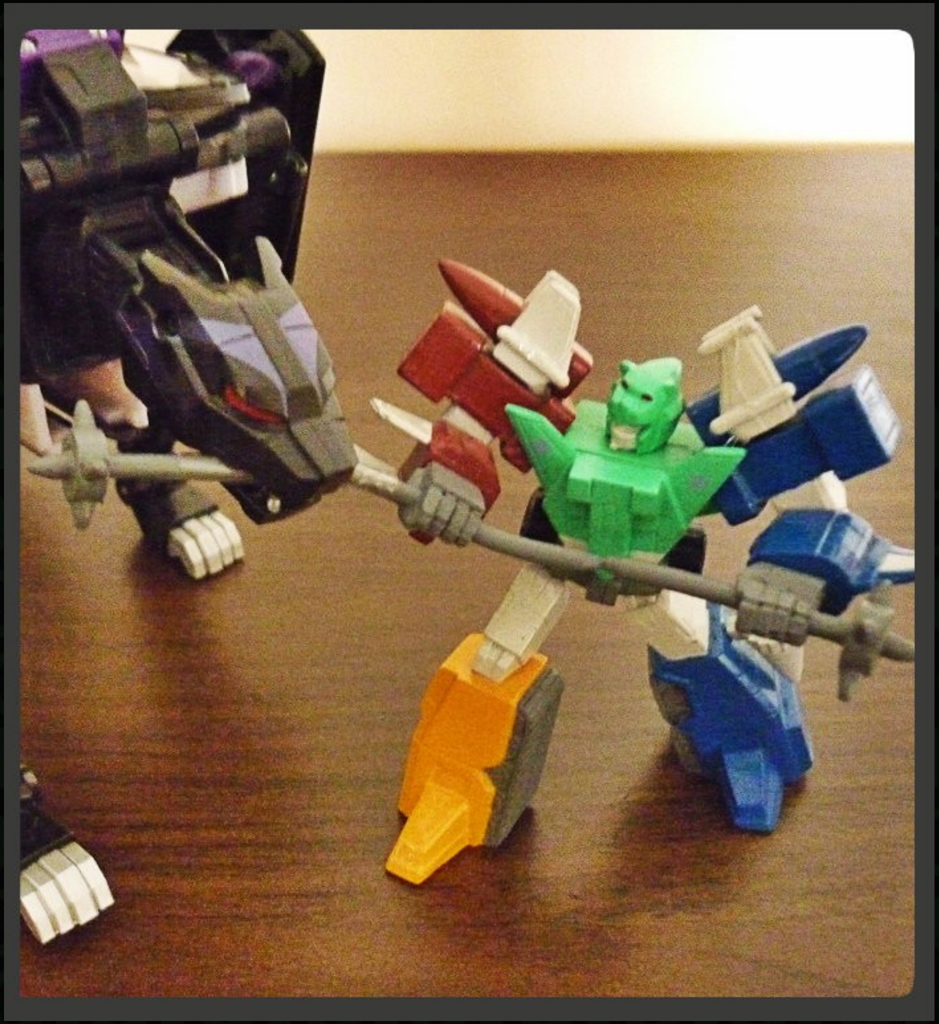
Profiling

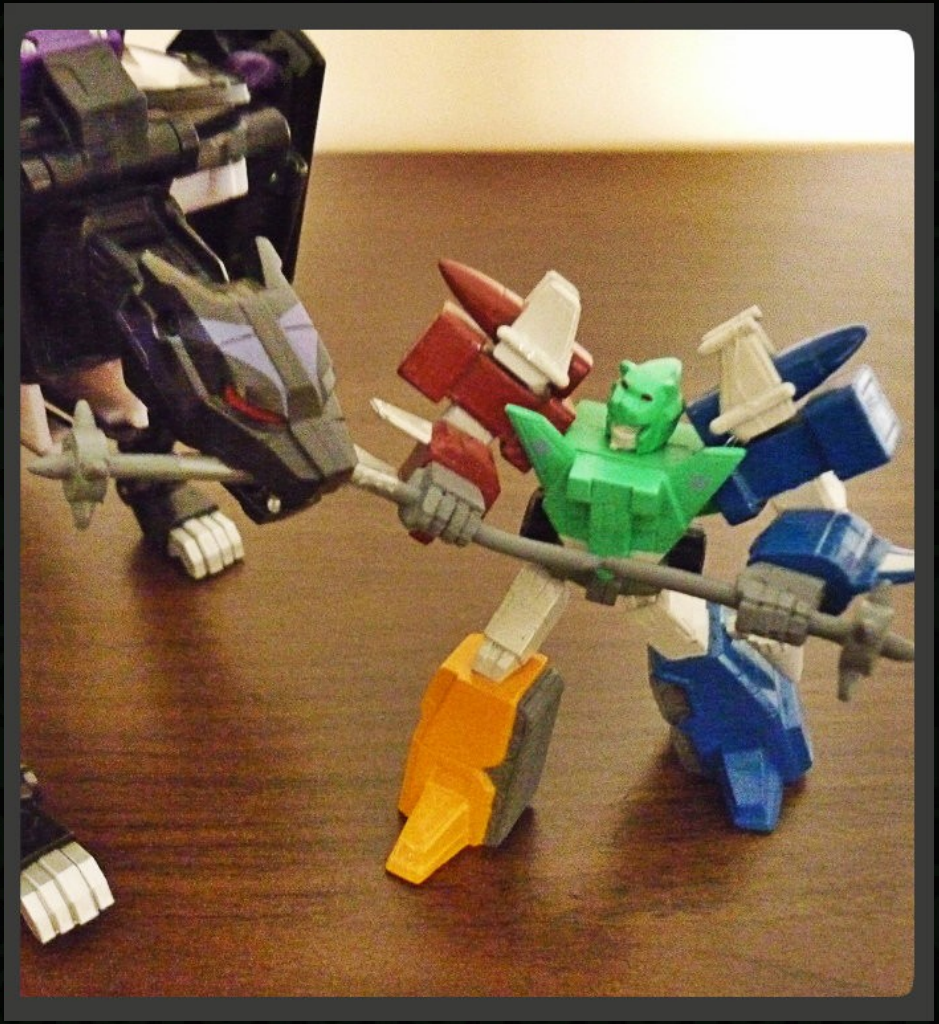
- CPU Load – `top` & `/proc/loadavg`
- Disk IO – `iotop`
- Memory – `free`
- Network – `netstat`

- Monitoring – `watch` & `time`

Profiling under load

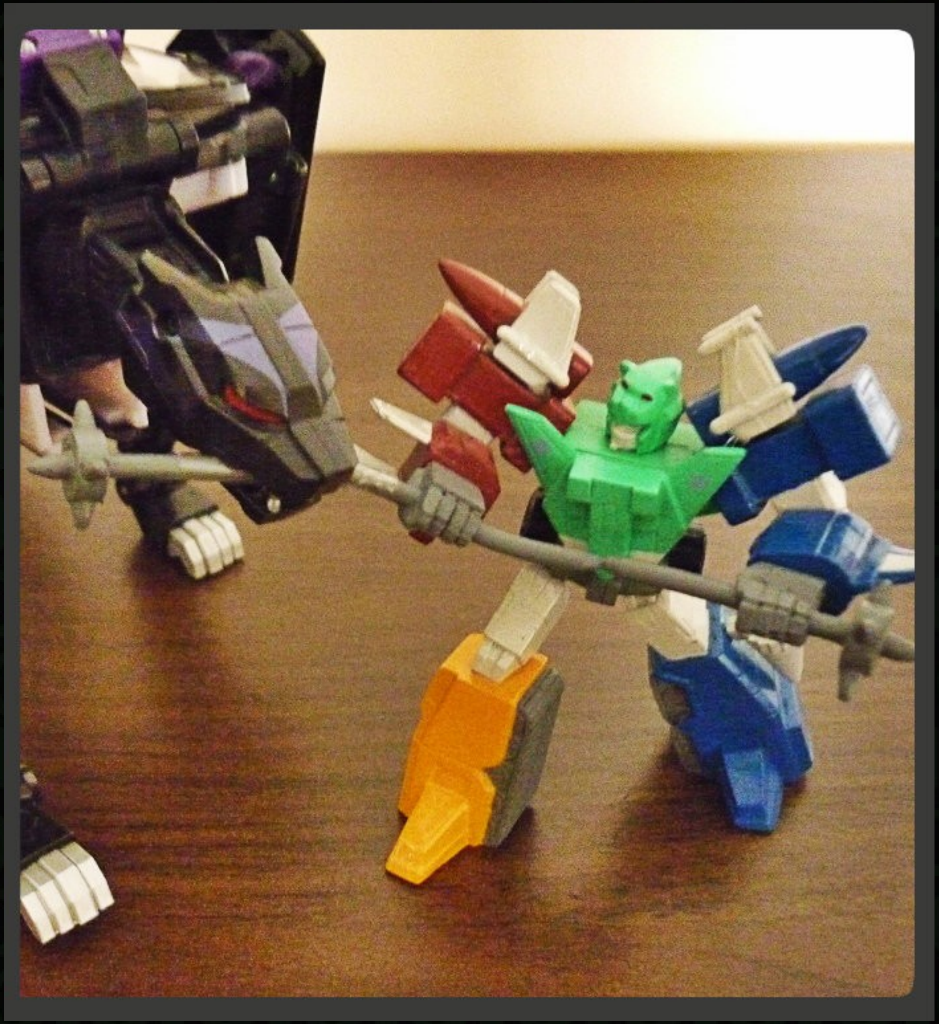


Profiling under load



- Code bottlenecks != Platform bottlenecks

Profiling under load



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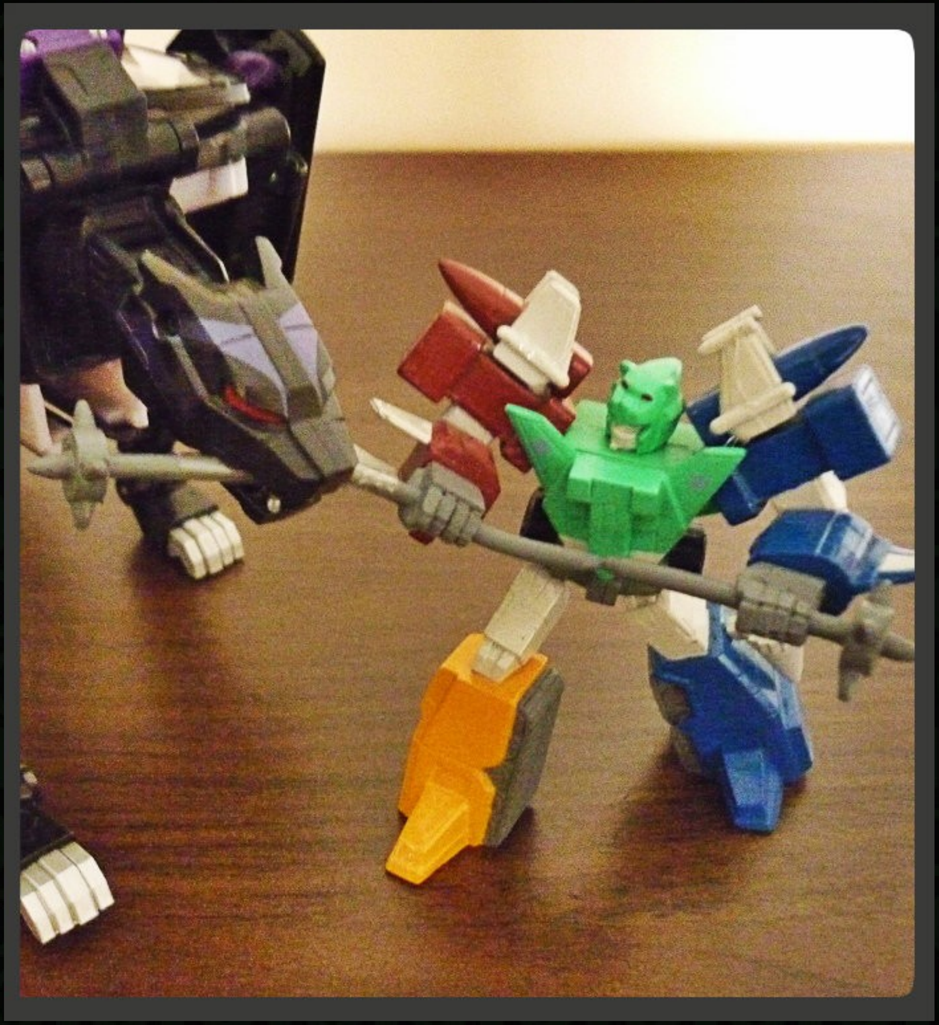

- Code bottlenecks != Platform bottlenecks
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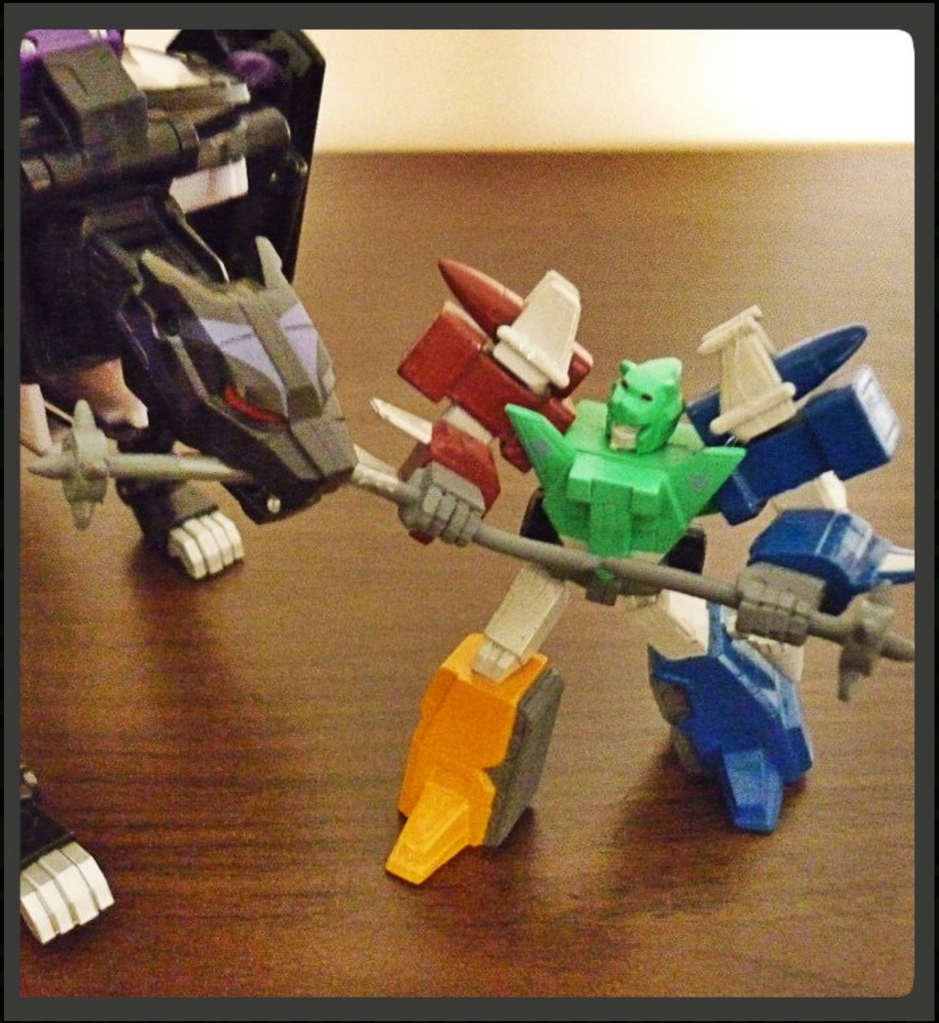
Profiling under load



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- Test in production, if possible
- Use multiple VMs (Vagrant can help automate this)
- Use siege & ab

Finding bottlenecks

Finding bottlenecks

Right	Wrong

Finding bottlenecks

Right **Wrong**

- Database

Finding bottlenecks

Right	Wrong
• Database • Disk IO	

Finding bottlenecks

Right

- Database
- Disk IO
- External services

Wrong

Finding bottlenecks

Right	Wrong
Database	
Disk IO	
External services	
Application work	

Finding bottlenecks

Right	Wrong
• Database	• Autoloaders
• Disk IO	
• External services	
• Application work	

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Right

- Database
- Disk IO
- External services
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Wrong

- Autoloaders
- Config files

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Finding bottlenecks

Right

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- Application work

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- Autoloaders
- Config files
- Logging
- Object instantiation

Finding bottlenecks

Right	Wrong
Database	Autoloaders
Disk IO	Config files
External services	Logging
Application work	Object instantiation
	Frameworks

Finding bottlenecks

Right	Wrong
• Database	• Autoloaders
• Disk IO	• Config files
• External services	• Logging
• Application work	• Object instantiation
	• Frameworks

Ask Jo (@juokas)
about Doctrine!

Tell users it's slow

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- User experience != Raw speed

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- Keep the UI responsive

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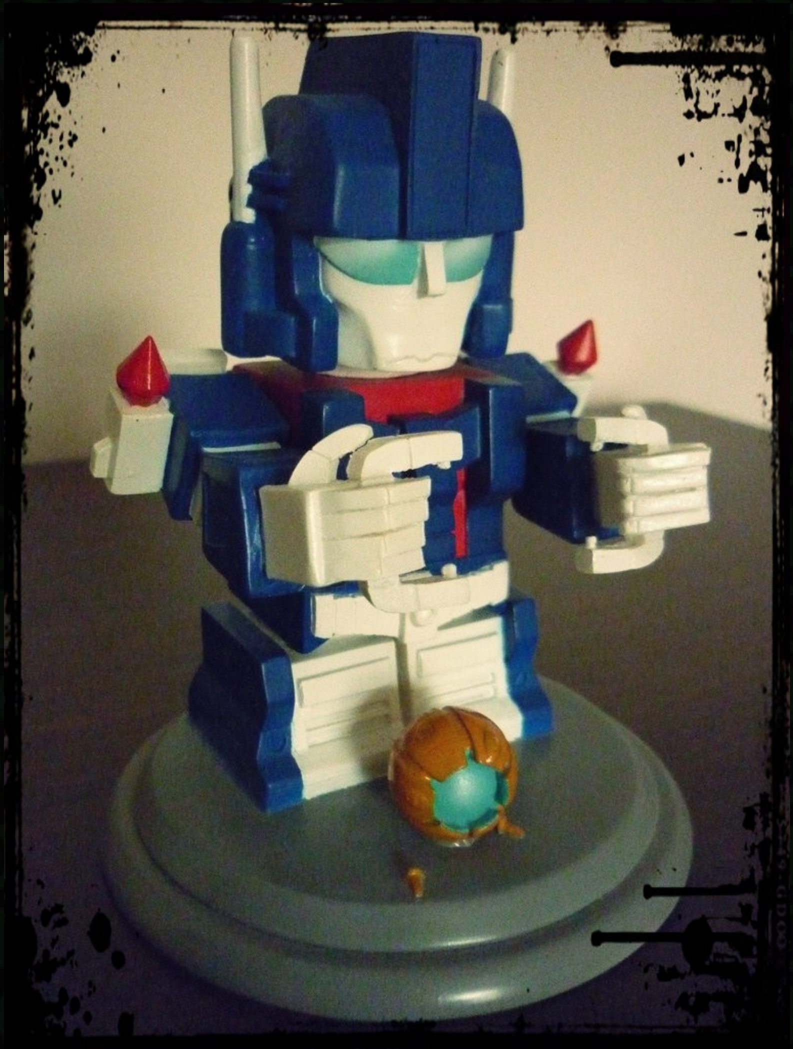
- Keep the UI responsive
- Set expectations

Tell users it's slow

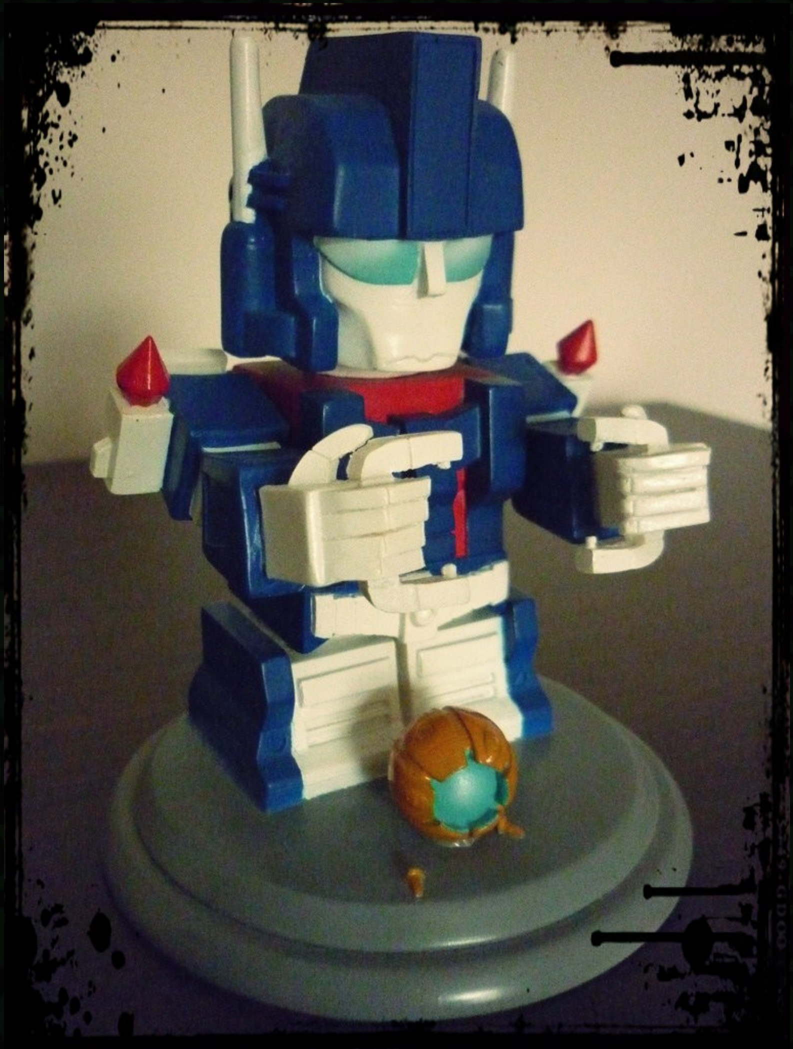
- User experience != Raw speed
- Keep the UI responsive
- Set expectations
- Adapt to changes (@blongden)

Fail gracefully



Fail gracefully

- Actively choose to time-out



Fail gracefully

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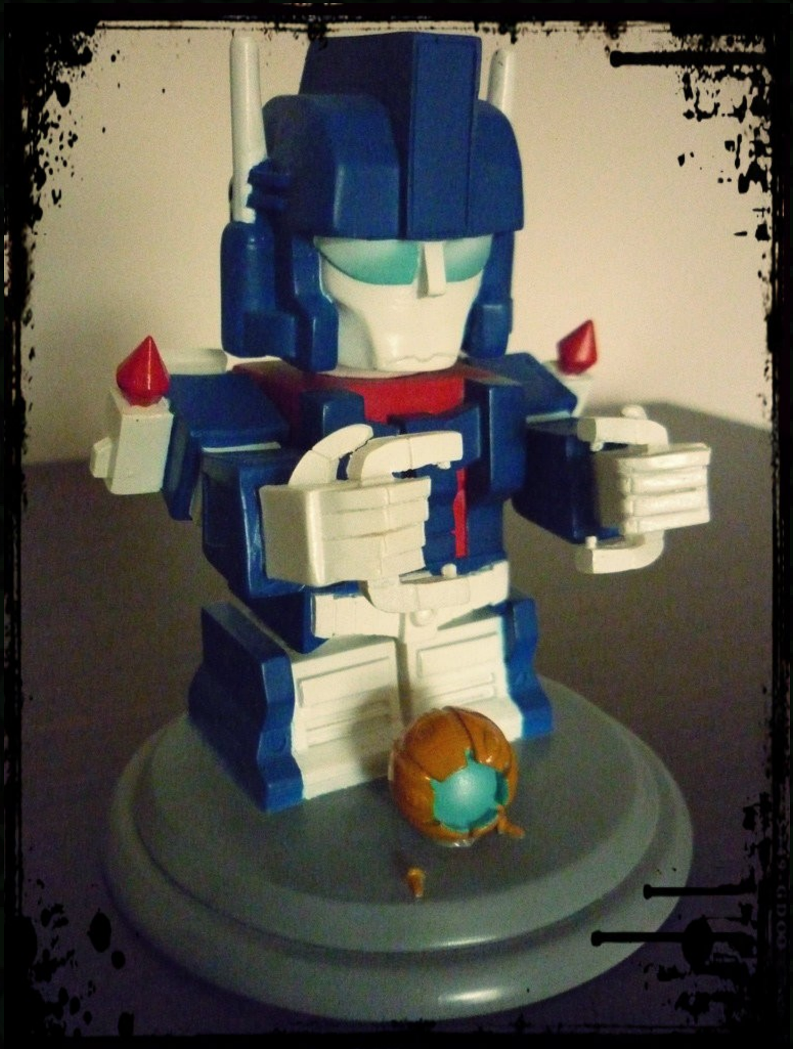
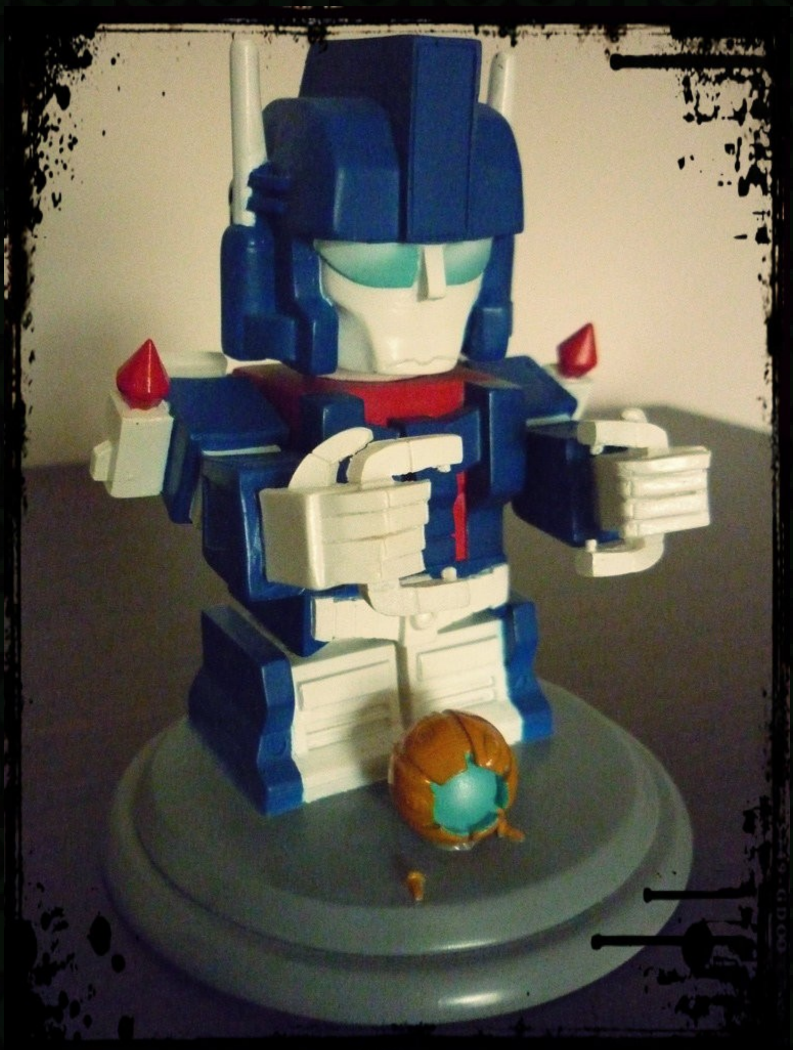


Fail gracefully

- Actively choose to time-out
- Prioritise core/profitable functionality
- Have a BIG **RED** BUTTON



Separate functionality

Separate functionality

Admin

Batch

Separate functionality

Admin **Batch**

- Different users == diff. requirements

Separate functionality

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- No cache

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Separate functionality

Admin

- Different users == diff. requirements
- No cache
- “Master” storage
- Security

Batch

- Not time critical
- CPU/RAM hungry
- `nice` / `ionice`
- Network rate limiting
- Read only?

Configure hardware correctly

Configure hardware correctly

- What is required for 1 request?

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Configure hardware correctly

- What is required for 1 request?
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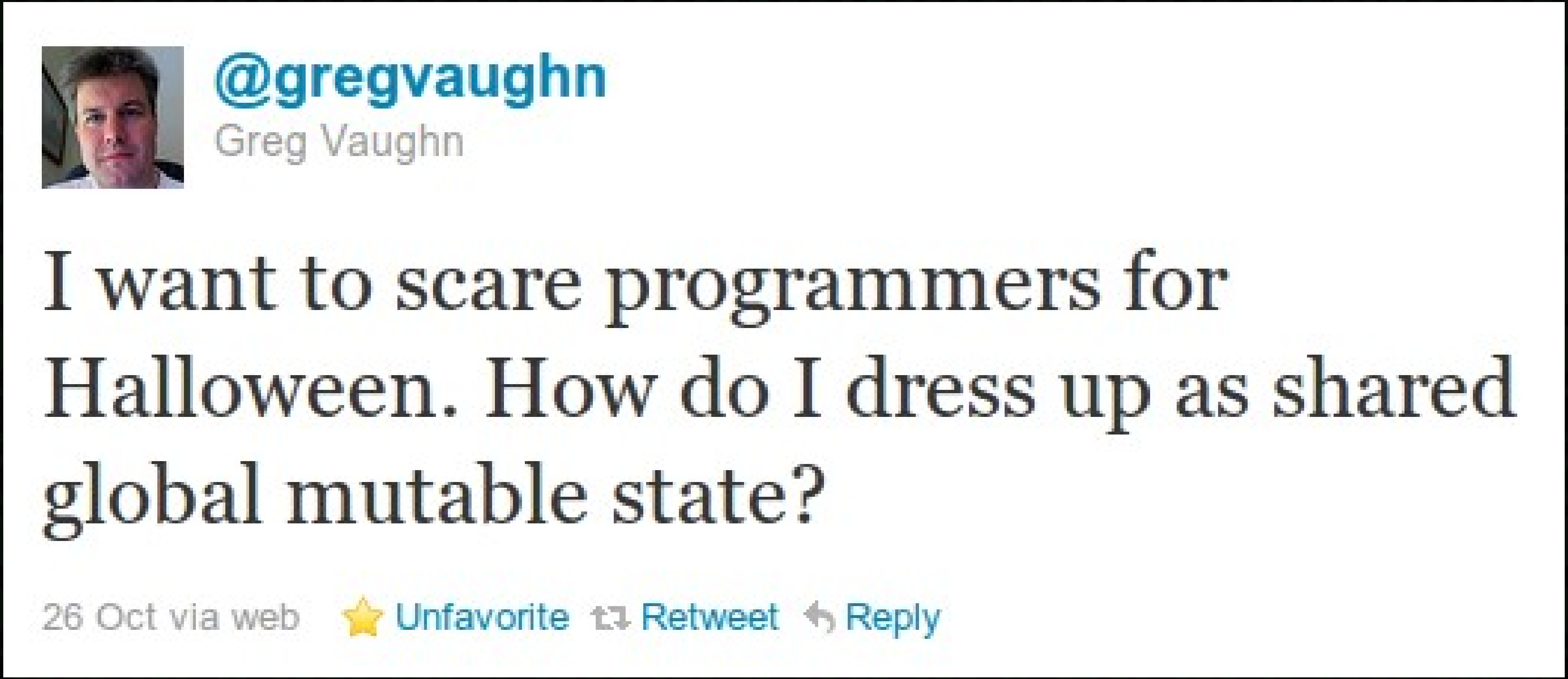
- Is it a linear scale?

Configure hardware correctly

- What is required for 1 request?
- How many concurrent requests?
- Is it a linear scale?
- Ask your hosting company

Aim for services

Aim for services


@gregvaughn
Greg Vaughn

I want to scare programmers for Halloween. How do I dress up as shared global mutable state?

26 Oct via web

Obey the “Law of Demeter”

Obey the “Law of Demeter”

- Talk to your friends, don't talk to strangers

Obey the “Law of Demeter”

- Talk to your friends, don't talk to strangers
- Promotes loose coupling

Obey the “Law of Demeter”

Good

Bad

Obey the “Law of Demeter”

Good

- `$person->requestPayment($amount);`

Bad

Obey the “Law of Demeter”

Good

- `$person->requestPayment($amount);`

Bad

- $wallet = $person->getWallet();
- $wallet->getMoney($amount);

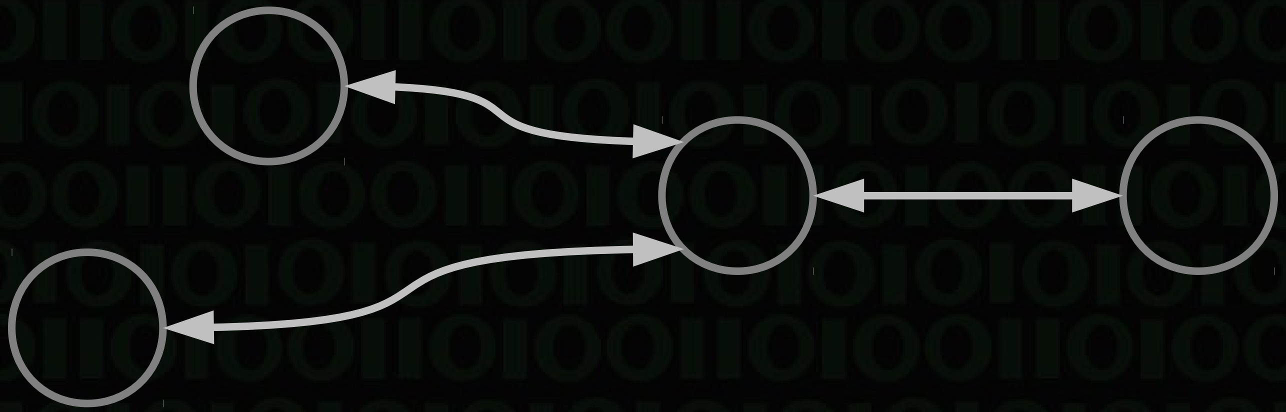
Obey the “Law of Demeter”

Good

Bad

Obey the "Law of Demeter"

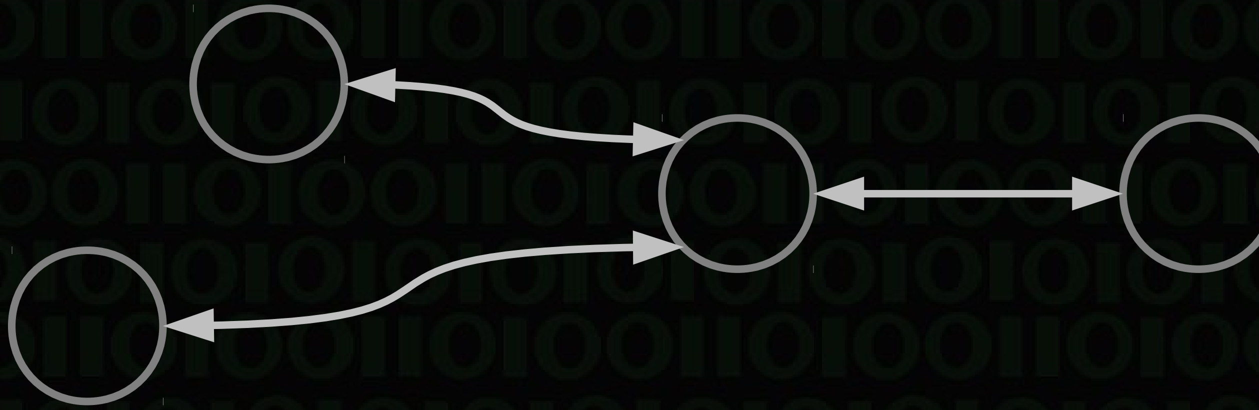
Good



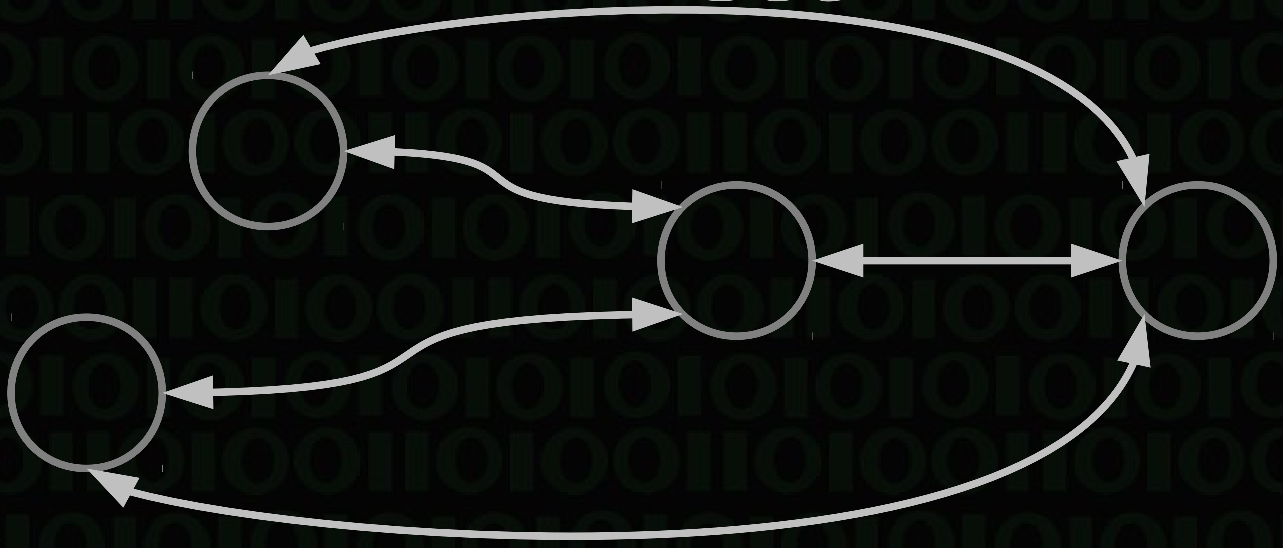
Bad

Obey the “Law of Demeter”

Good



Bad



Create immutable objects

Create immutable objects

- Objects that cannot change after creation

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- Copy On Write (COW - 🐮 ← unicode cow)

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Create immutable objects

- Objects that cannot change after creation
- Copy On Write (COW - 🐮 ← unicode cow)
- More memory-hungry, but easy to roll back
- Value objects should be immutable

- Think of them like a response from a service

Identify “single server” factors

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- File uploads / user content

Identify “single server” factors

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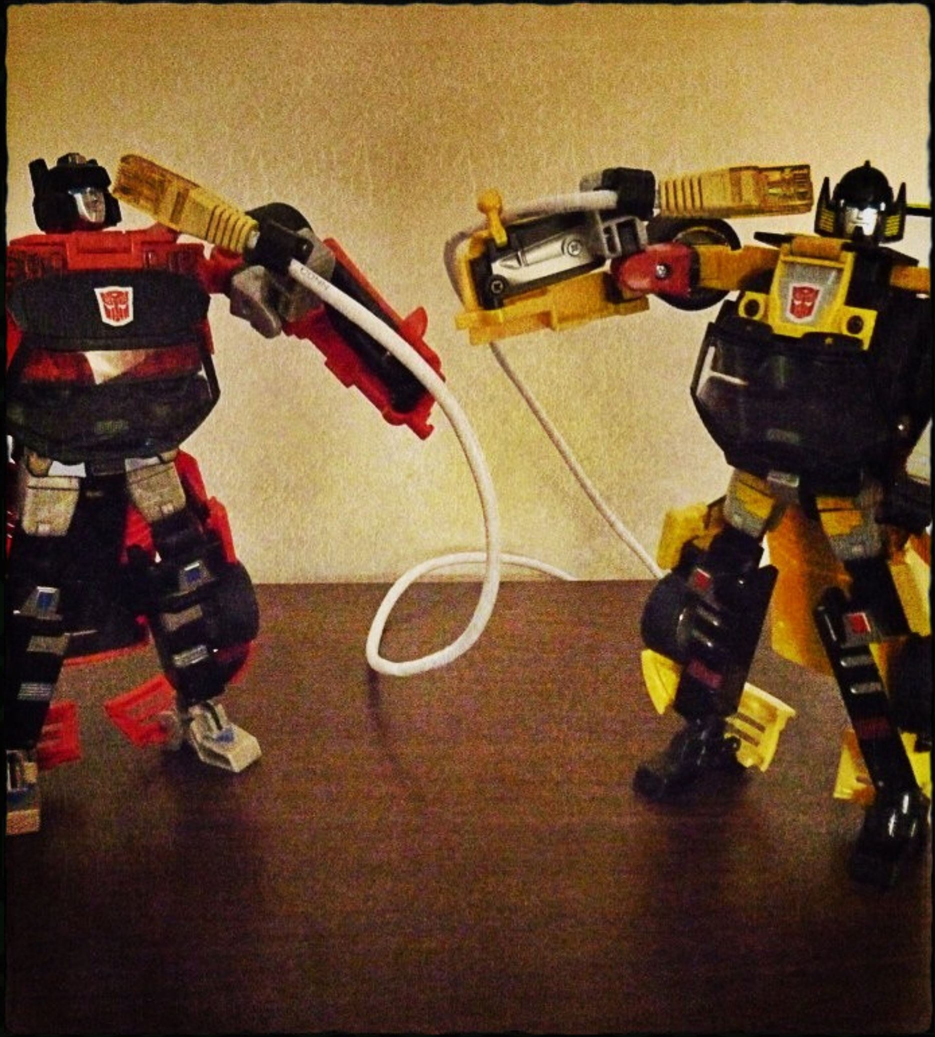
- IP restrictions / server access

Identify “single server” factors

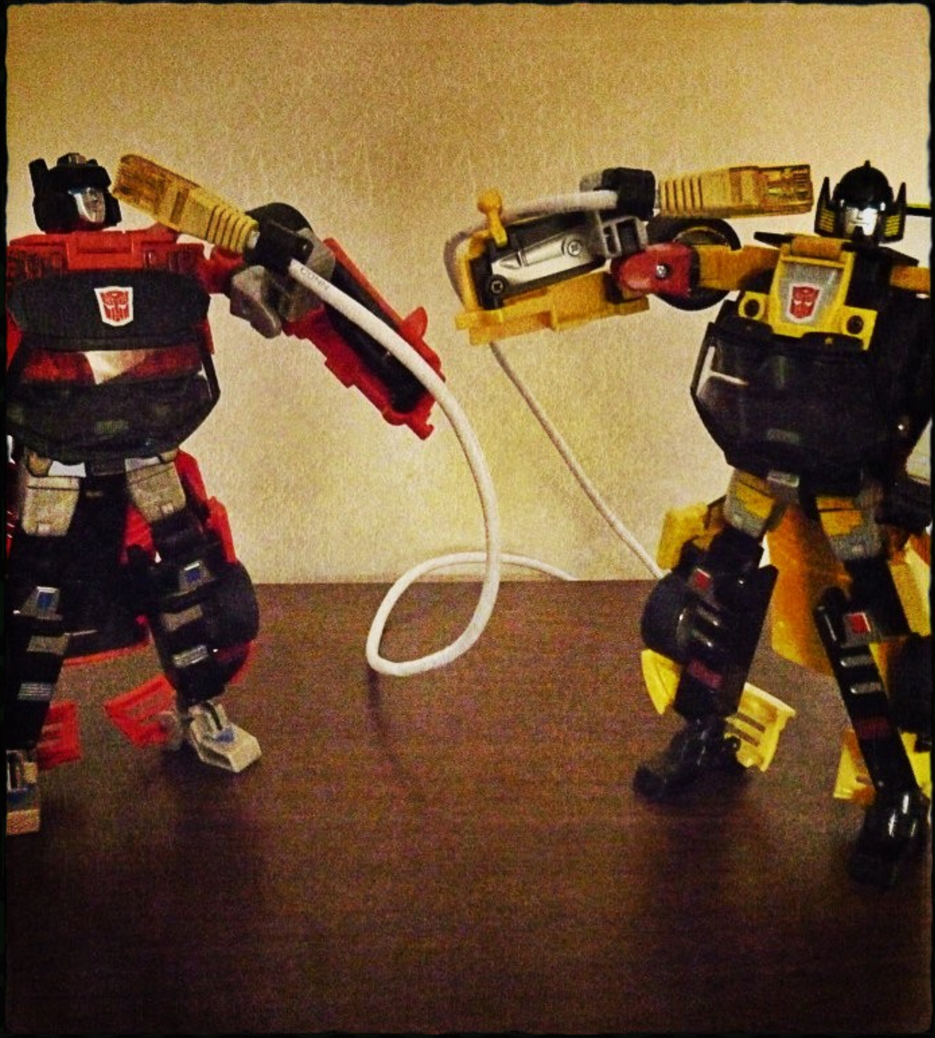
- File uploads / user content
- IP restrictions / server access
- Licensing?

Create services



Create services

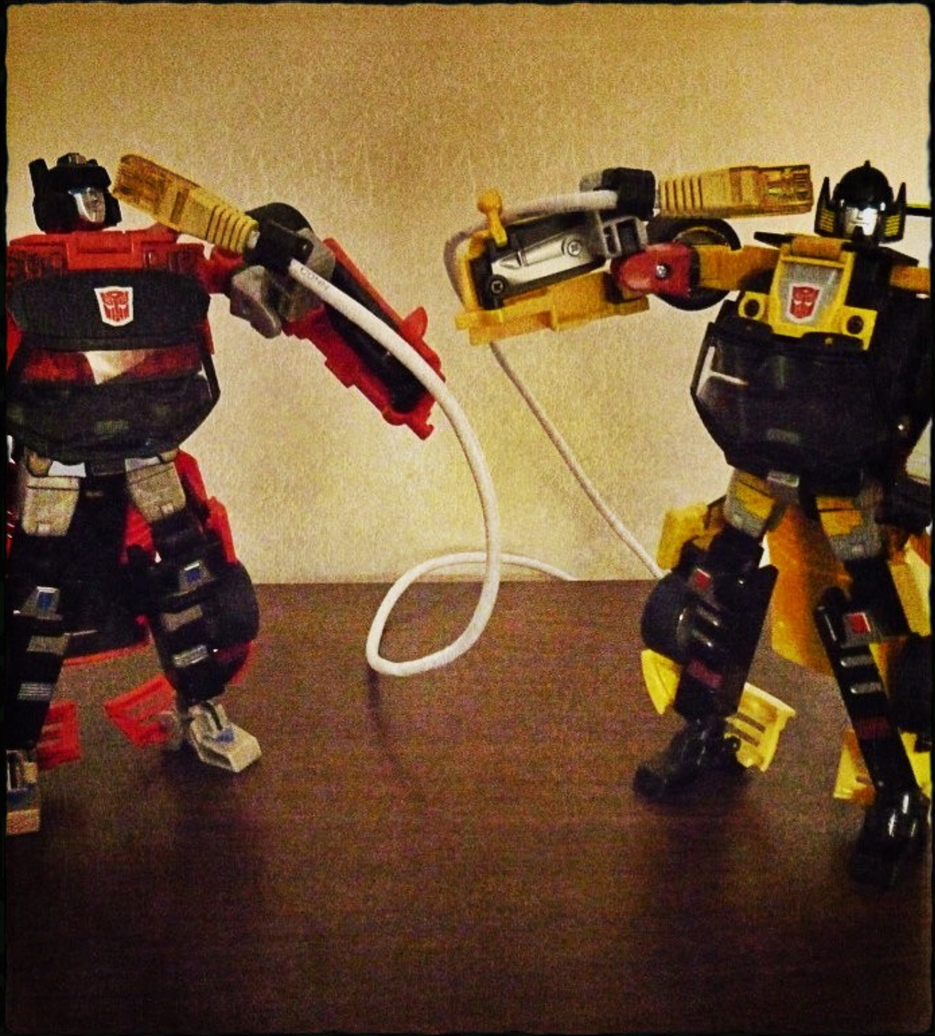
Your API should be:



Create services

Your API should be:

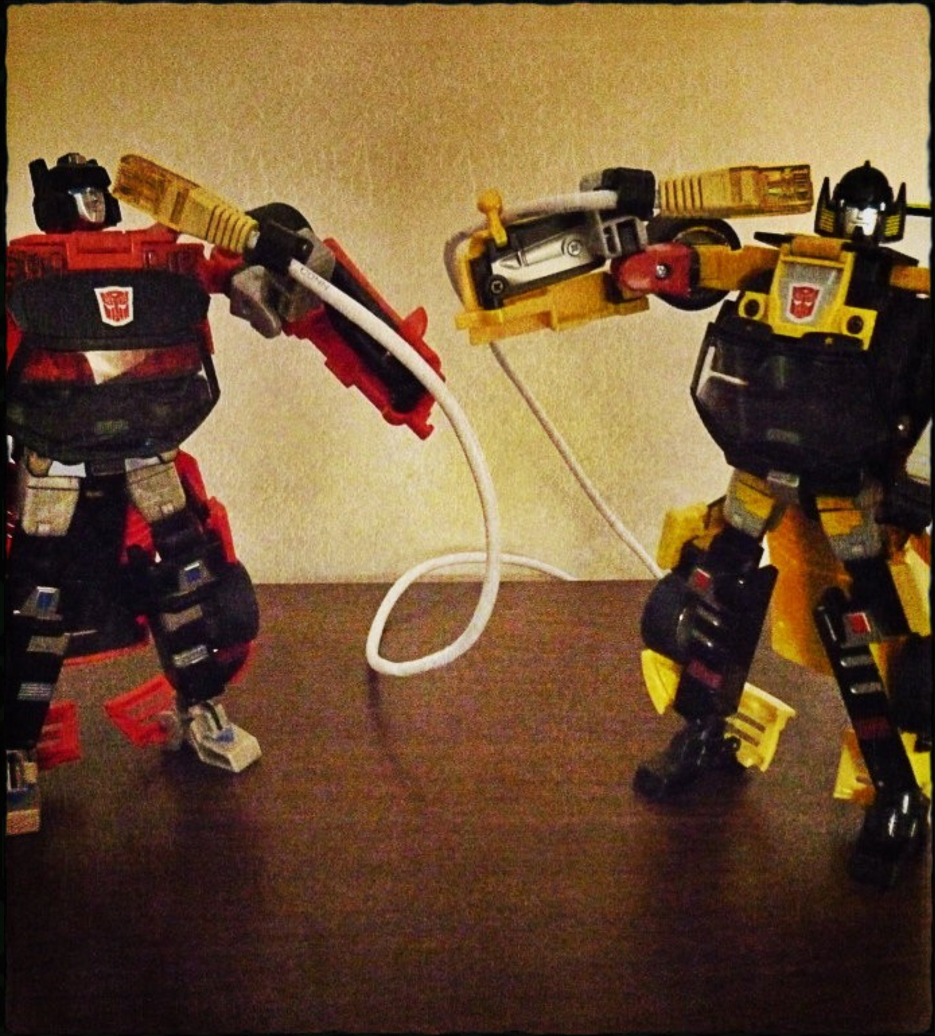
- Independent of application state



Create services

Your API should be:

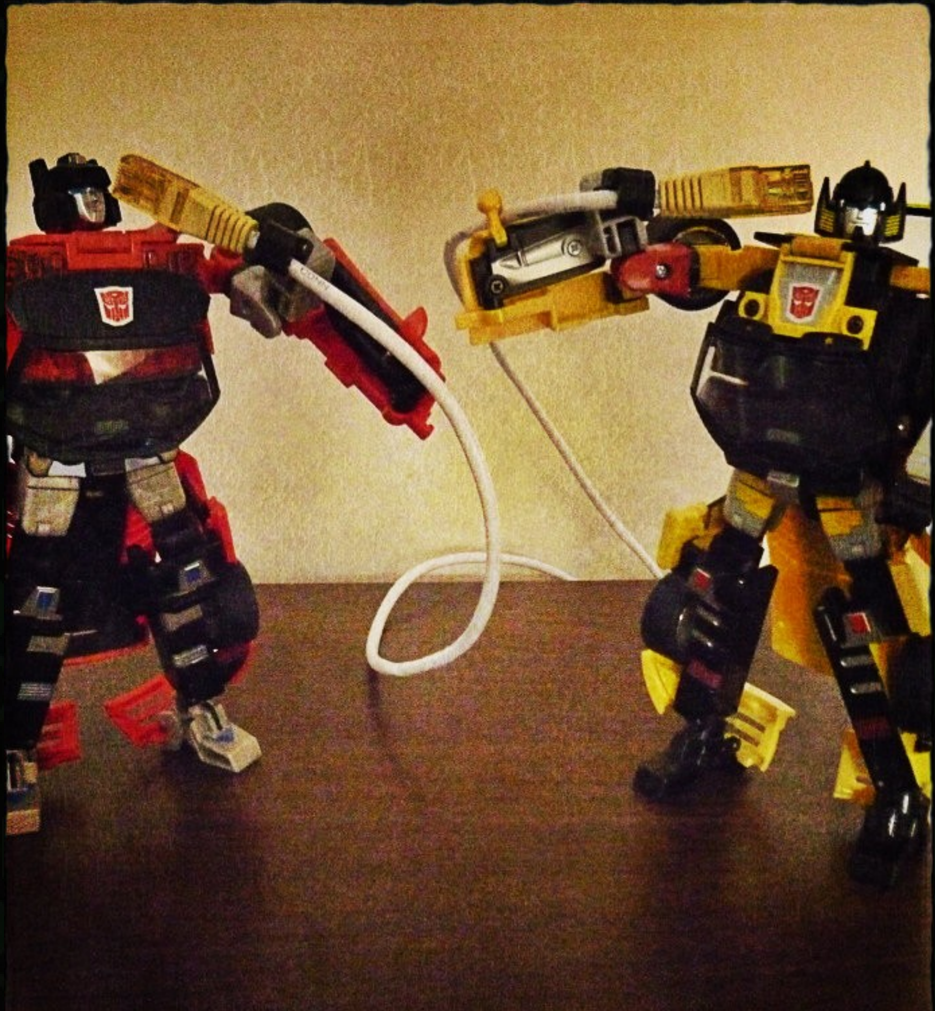
- Independent of application state
- Loosely coupled



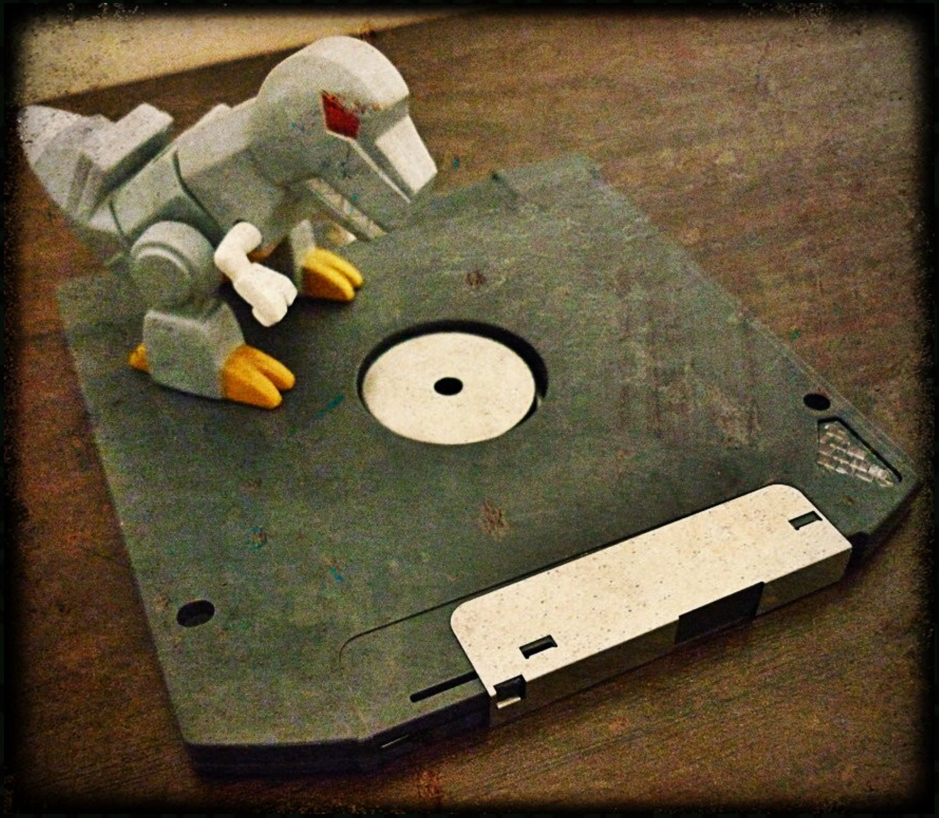
Create services

Your API should be:

- Independent of application state
- Loosely coupled
- Accepting/returning immutable objects



Use caches



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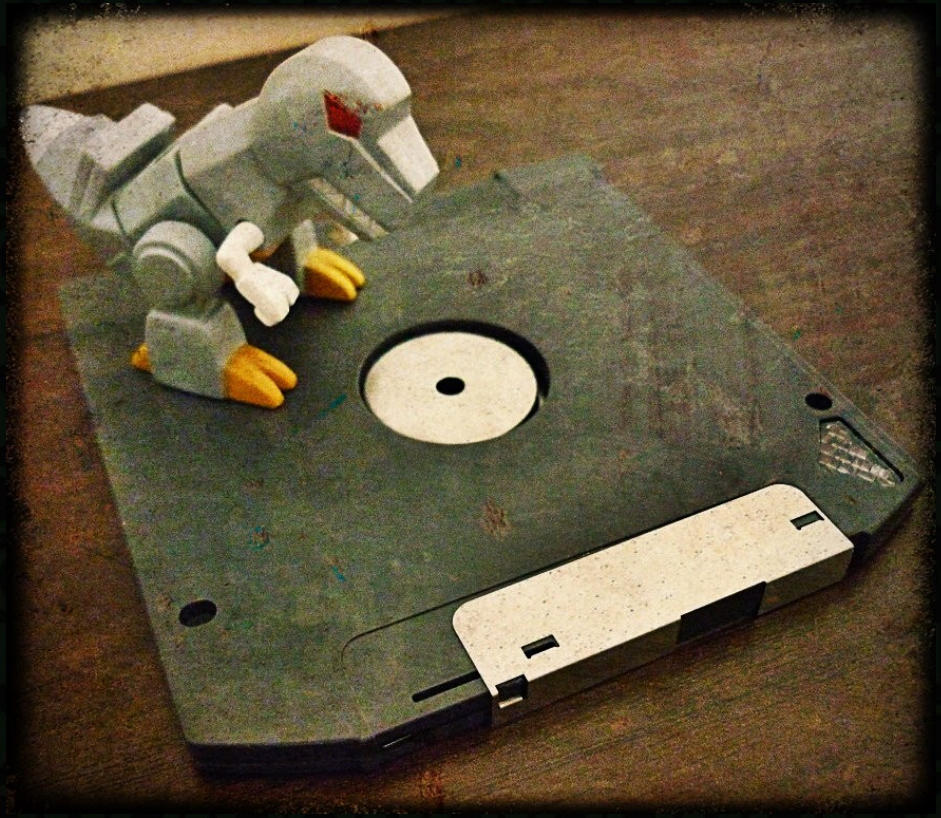
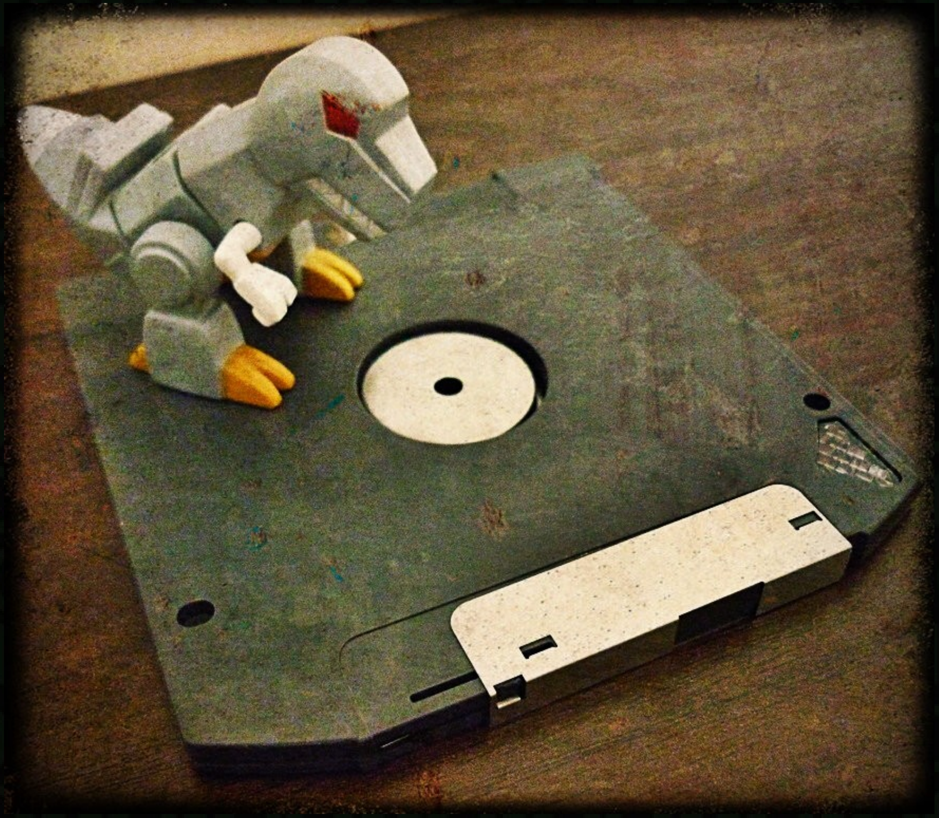


- REST-ful services over HTTP let you cache easily

Use caches



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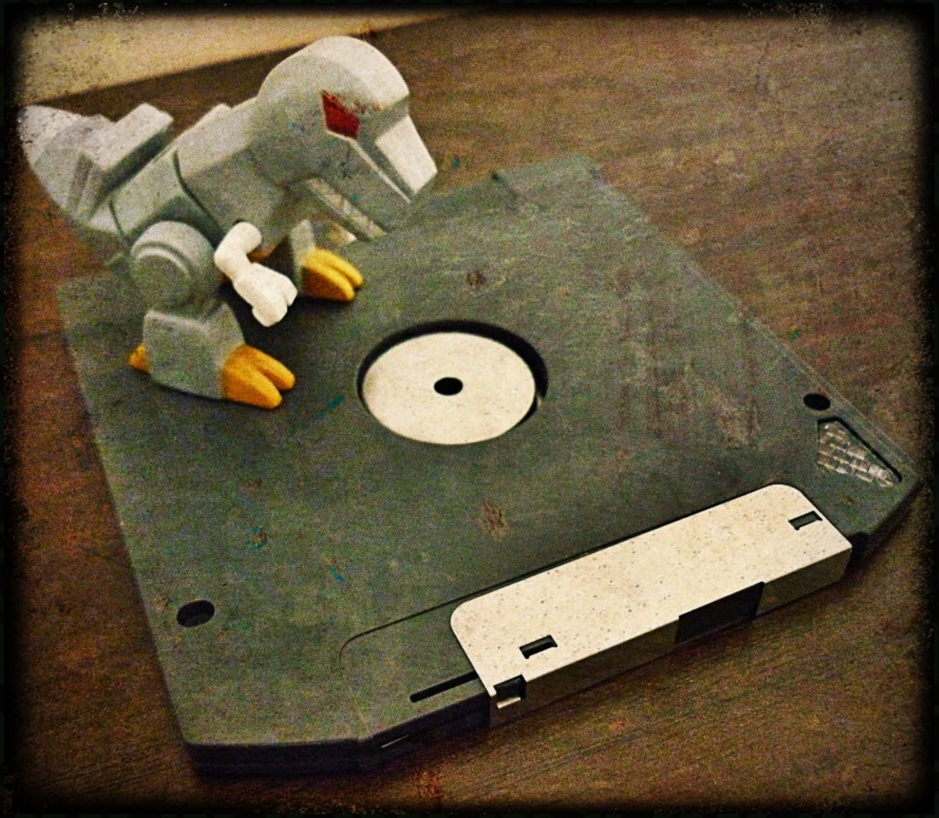
- Internal caching is trickier, but “out-of-the-box” with most frameworks

Use caches



- REST-ful services over HTTP let you cache easily
- Internal caching is trickier, but “out-of-the-box” with most frameworks

Proxy other people's services through your own cache!

Use queues

Use queues

- Full blown job server: Gearman

Use queues

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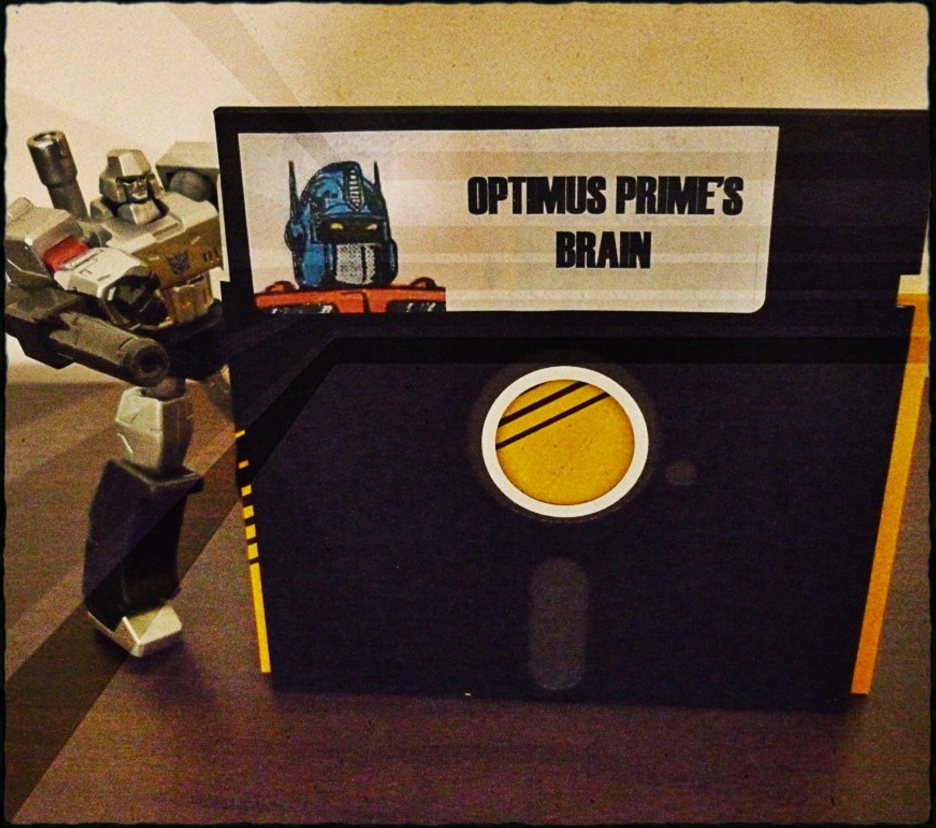
- AMQP implementation: RabbitMQ

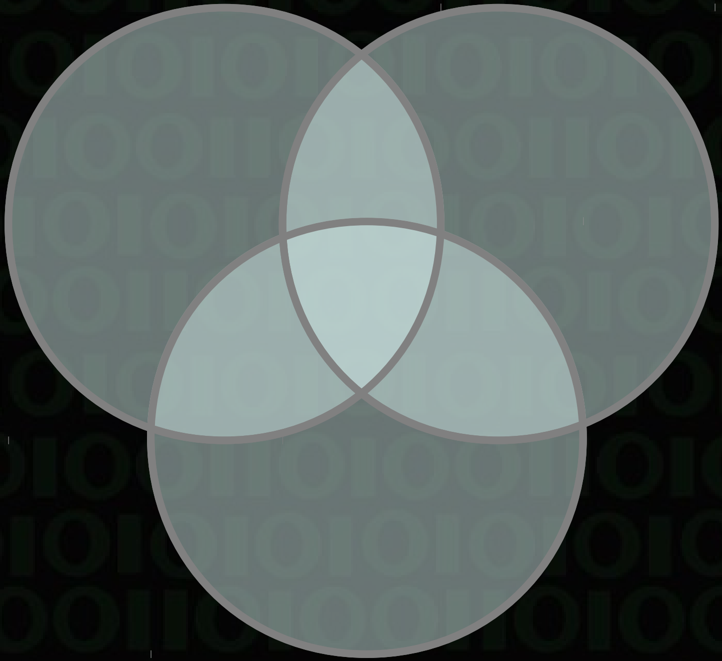
Use queues

- Full blown job server: Gearman
- AMQP implementation: RabbitMQ
- Light-weight sockets: 0MQ

Use the right storage

Use the right storage





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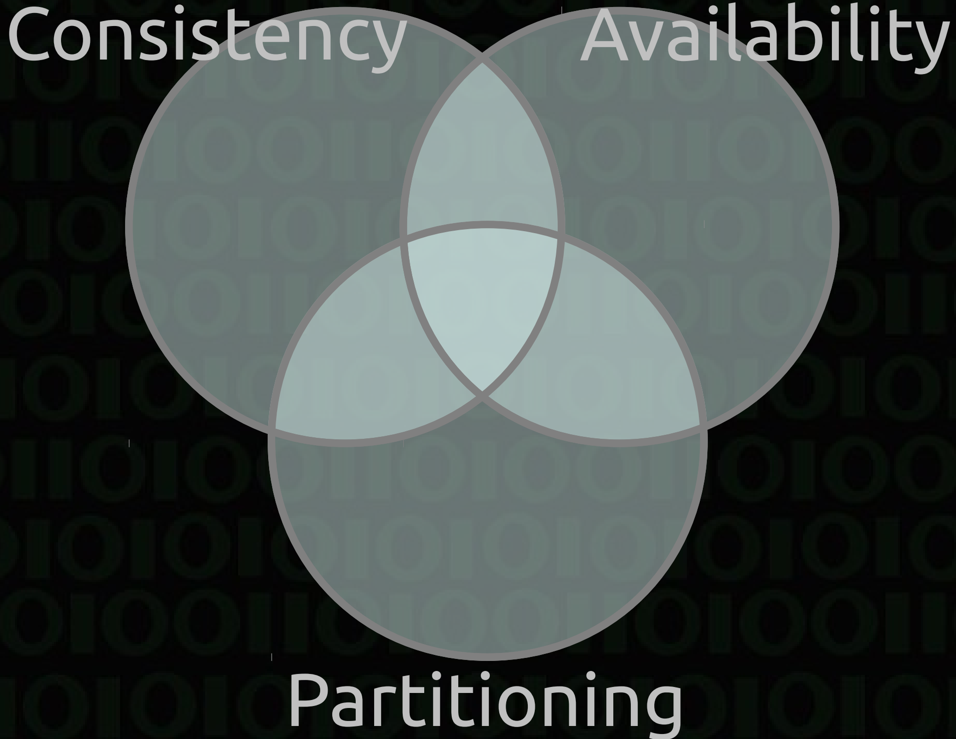

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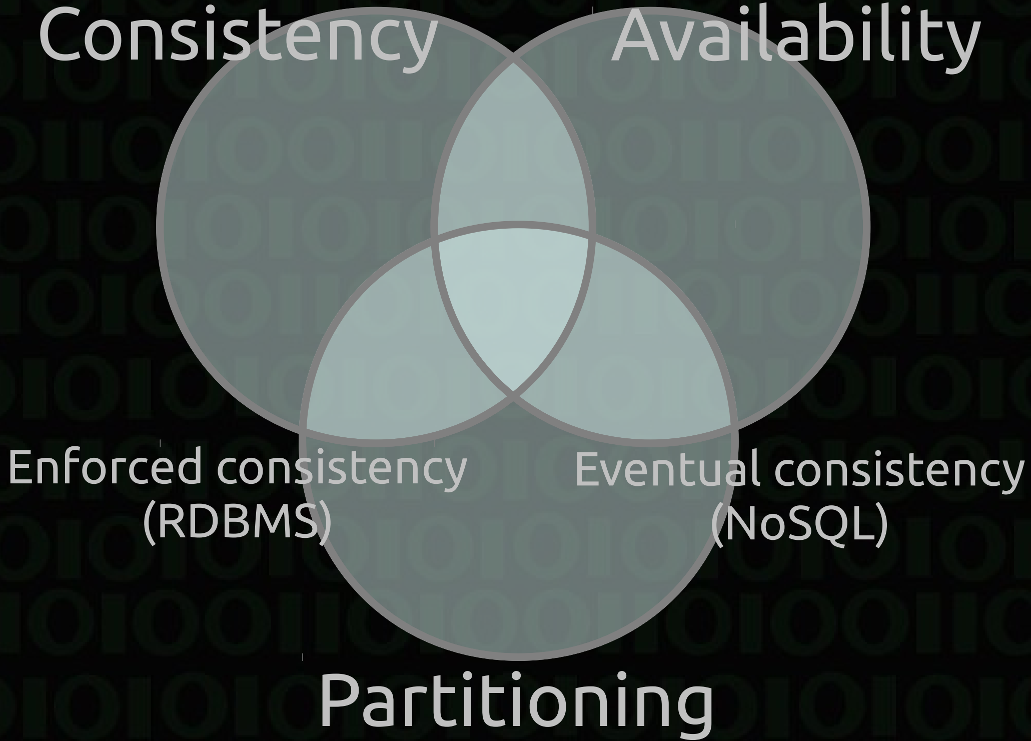

Scale your storage

Scale your storage

- Master/slave replication

Scale your storage

- Master/slave replication
- Table partitioning

Scale your storage

- Master/slave replication
- Table partitioning
- Row partitioning

Scale your storage

- Master/slave replication
- Table partitioning
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- rsync

Scale your storage

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Scale your storage

- Master/slave replication
- Table partitioning
- Row partitioning

- rsync
- NFS
- GlusterFS

Now you can use the cloud

Now you can use the cloud

- Full service – orchestra.io

Now you can use the cloud

- Full service orchestra.io
- Infrastructure mgmt. Scalr

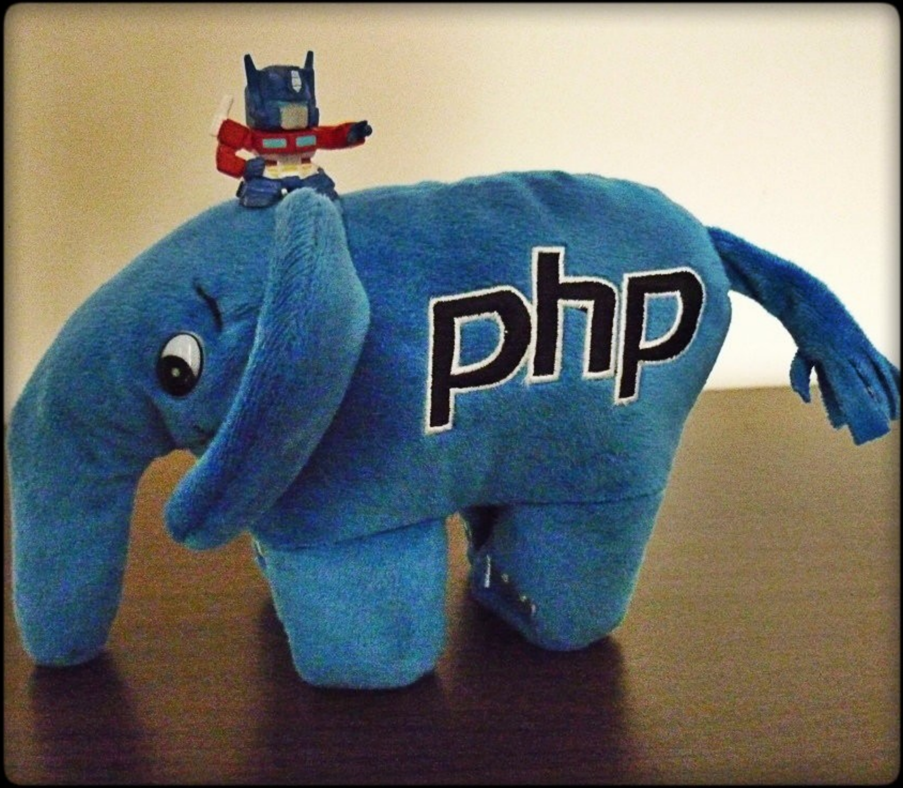
Now you can use the cloud

- Full service
  orchestra.io
- Infrastructure mgmt.
  Scalr
- Manually
  $your_code_here

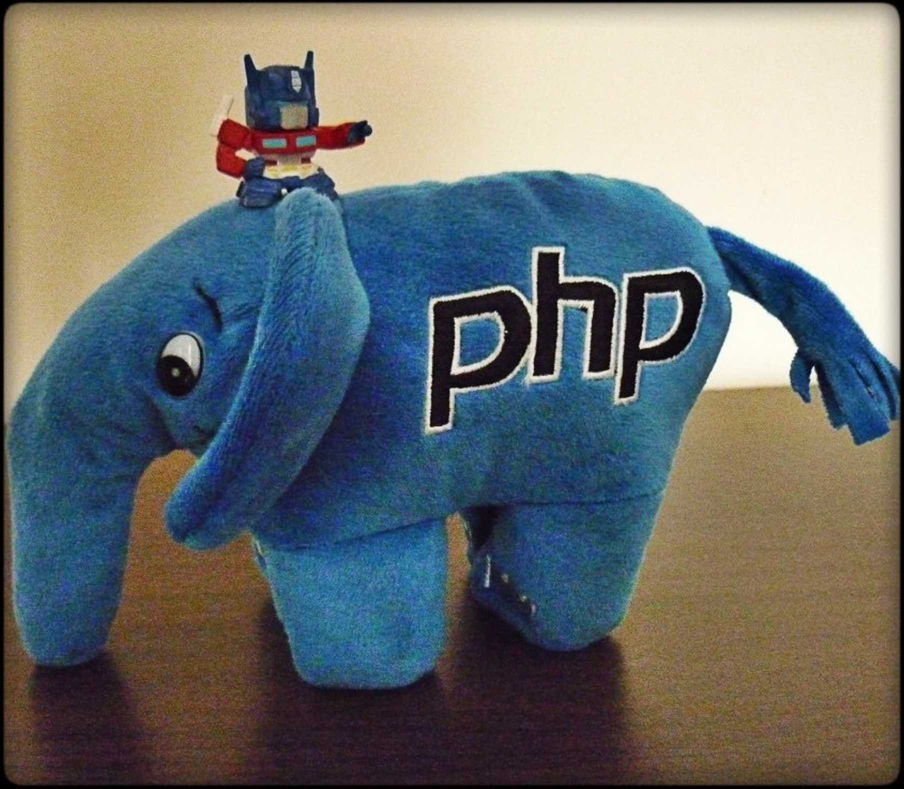
Now you can use the cloud

- Full service
  orchestra.io
- Infrastructure mgmt.
  Scalr
- Manually
  $your_code_here
- Automate!
  Chef & Puppet

Review

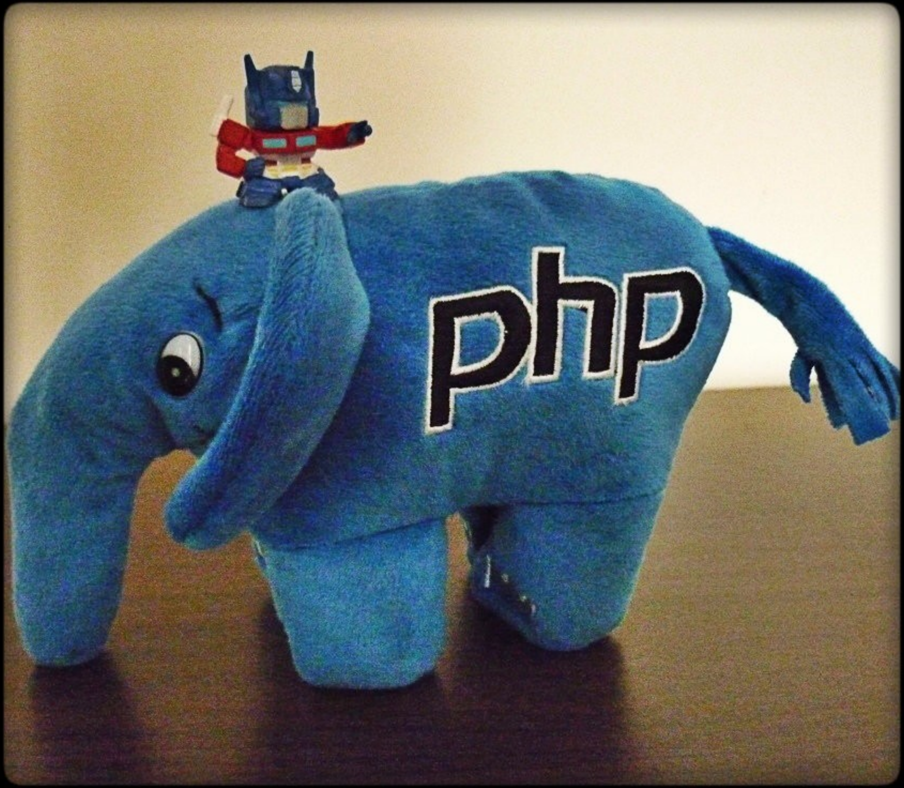


Review



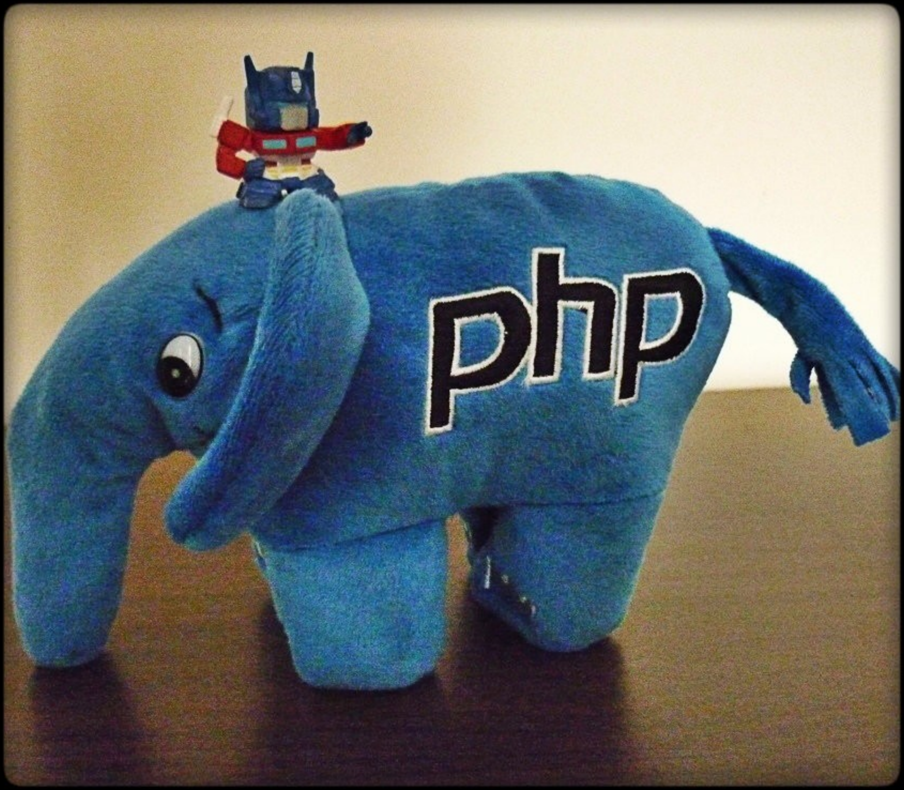
- Start with only what you need

Review



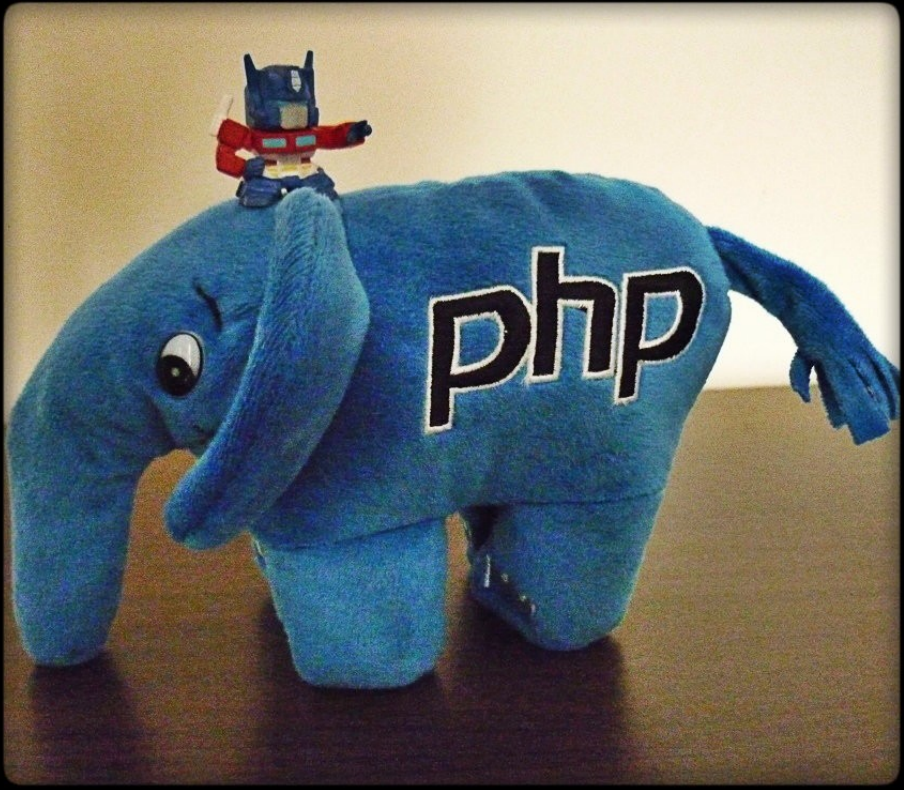
- Start with only what you need
- Identify the problems

Review



- Start with only what you need
- Identify the problems
- Pull the problem out to a service

Review



- Start with only what you need
- Identify the problems
- Pull the problem out to a service
- Distribute

Thank you!

- Feedback:

  http://joind.in/6324

- Photos & Transformers:
  Nina Merewood
- Legal?
  Takara & Hasbro
- ElePHPant smuggling:
  Johannes Schlüter (@phperror)
- Vintage photo nonsense:
  http://pixlr.com/o-matic/