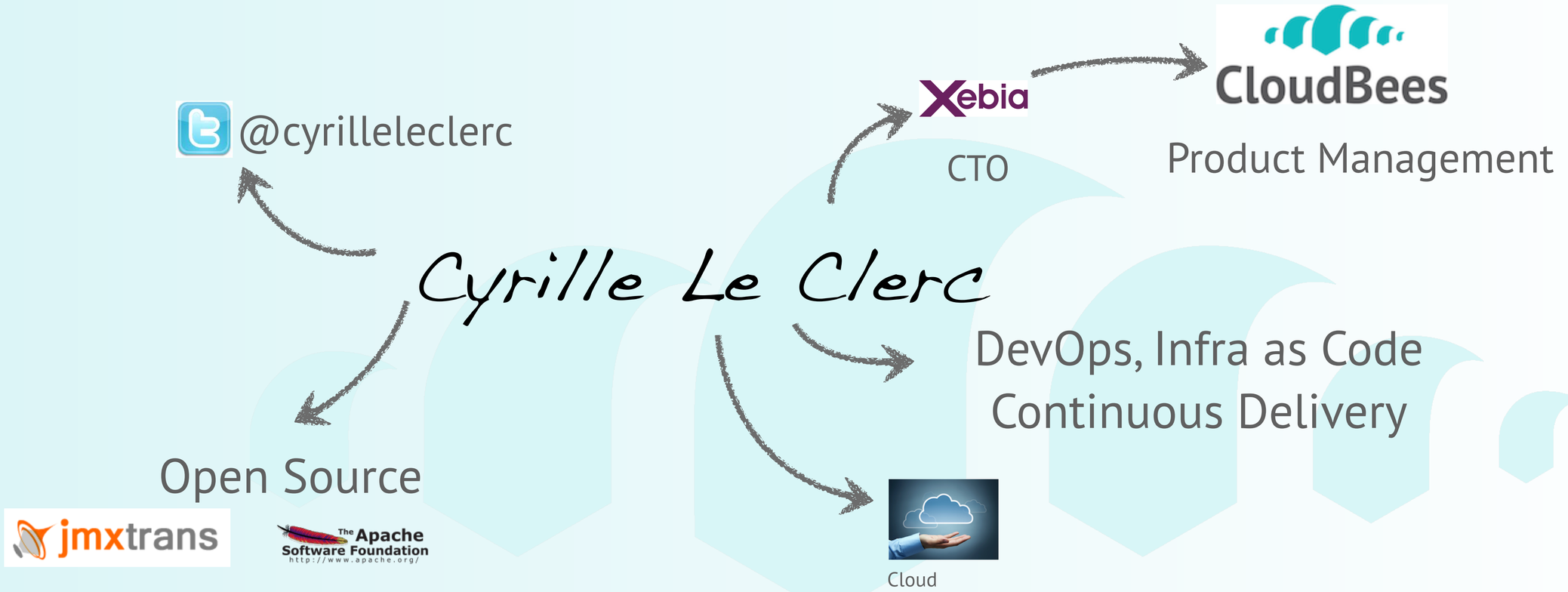
Patterns d'architecture pour le Cloud

Cyrille Le Clerc

BY NC SA

/me


@cyrilleleclerc
Xebia
CTO
CloudBees
Product Management
Cyrille Le Clerc
DevOps, Infra as Code
Continuous Delivery
Open Source
jmxtrans
The Apache Software Foundation
http://www.apache.org/
Cloud

CloudBees

- **Premier provider of Jenkins services and support**
- **Java PaaS**
- CEO: Sacha Labourey
- CTO: Kohsuke Kawaguchi

You ?

Dev? Ops? Cloud?

Agenda

- Paradigm Shift: Cloud Services Oriented Architecture
- Design Patterns for the Cloud
- Conclusion

Paradigm Shift

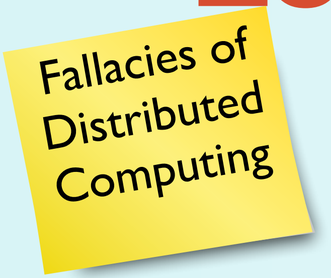
Cloud Services Oriented Architecture

*aaS Ecosystem

- ***aaS is about service, not software**
- Integrate services, don't try to setup your own infrastructure
- Amazon AWS: the place to be for *aaS

*aaS Ecosystem

Location and Colocation



- Collocate application and databases
- Some systems can be distant
- Choose your cloud according to the services you require

The Cloud & The Law

I'm not a lawyer!!!

We self-certify compliance with U.S.-EU SAFEHARBOR US DEPARTMENT OF COMMERCE

Payment Card Industry Data Security Standard (PCI DSS)

HIPAA

US EU Safe Harbor

ISO 27001

Personally Identifiable Information

SSAE 16

The Cloud & The Law

I'm not a lawyer!!!

We self-certify compliance with U.S.-EU SAFEHARBOR US DEPARTMENT OF COMMERCE

Payment Card Industry Data Security Standard (PCI DSS)

Data Privacy

arbor

HIPAA

Compliance

Information Security Management System ISO 27001 Certified

HIPAA

Liability

ISO 27001

Personally Identifiable Information

Data Portability and Reversibility

Applicable Law

SSAE 16

FIPS 140-2 FIPS CRYPTOGRAPHY

PAYMENT CARD INDUSTRY PCI DSS COMPLIANT LEVEL 1 SERVICE PROVIDER DATA SECURITY STANDARDS

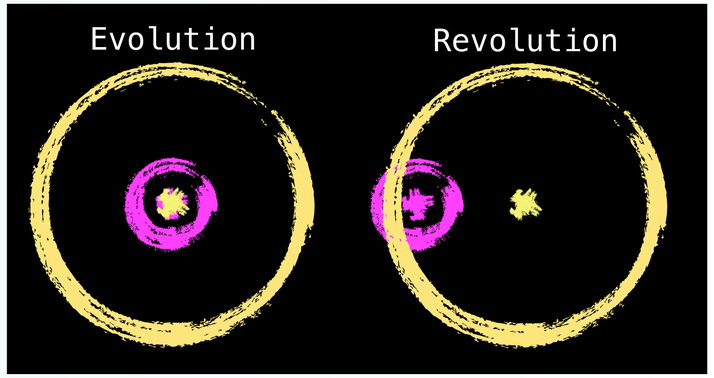
Pricing Model

- Pay-per-use vs. fixed price
- Beware of unbounded pricing models
- Prepare a credit card
- Pay-per-use vs budget

Selection Criteria for a Service Provider

- Location
- Performances
- Reliability
- Legal
- Security
- Pricing model

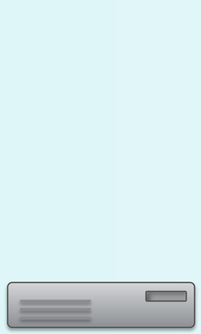
Design Patterns for the Cloud



Scale Out

Scale Up

- Still possible, but up to a limit
- Not optimal



M1 Small

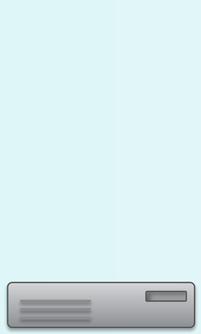
M3 Large

M3 2 XLarge

Then ???

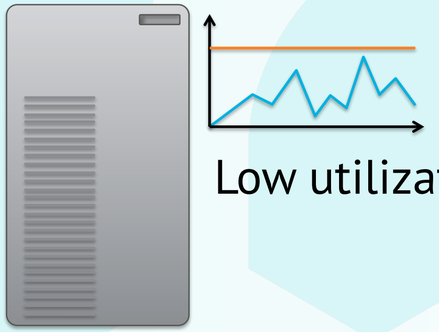
Scale Up

- Still possible, but up to a limit
- Not optimal



M1 Small

M3 Large



M3 2 XLarge

Low utilization!

Then ???

M3 Extra Large

- 15 Gb memory
- 4vCPU (~1/2 Intel® Xeon® Processor E5-2670)
- 2x40 GB SSD HD

- aka « your desktop »

Scale out

Design for clustering

Scale as you need

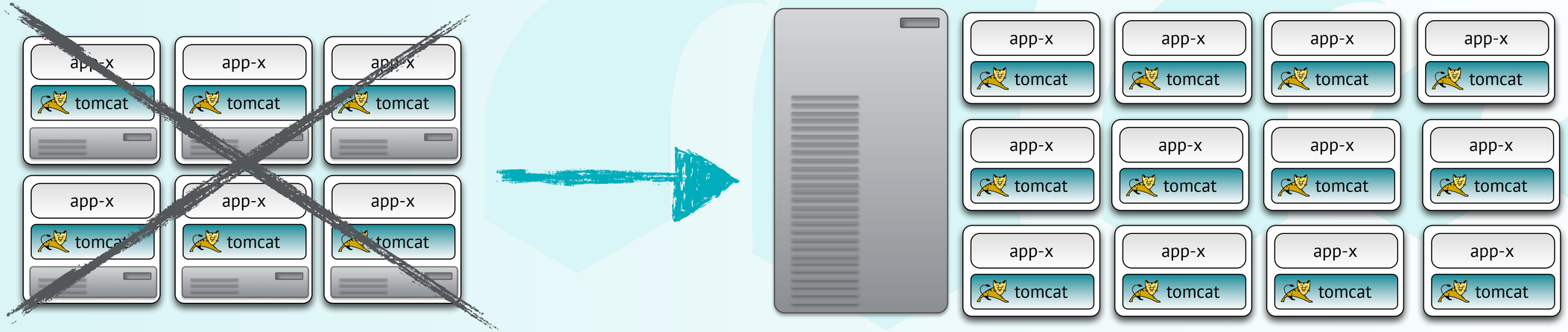
Pay as you use

Scale Out

Multi tenancy - PaaS backstage

Multi tenancy - PaaS backstage

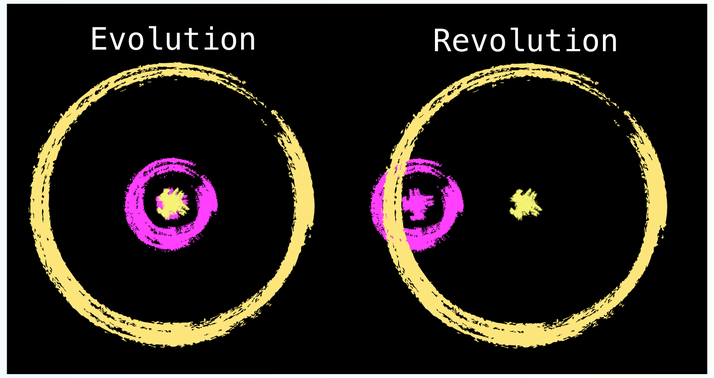
- Multi tenancy at the app level, not at the OS level
- Slice big servers into slices



Multi Tenancy

- OS level (hypervisor): IaaS
- **OS virtualization (cgroups, LXC, Docker): PaaS**
- Middleware ?

  Java 9 to be multi-tenant ?
- Application: SaaS



Fear the File System

Fear the File System

- Think multi instance
- Shared file system is difficult
- Best practice for any automated deployment

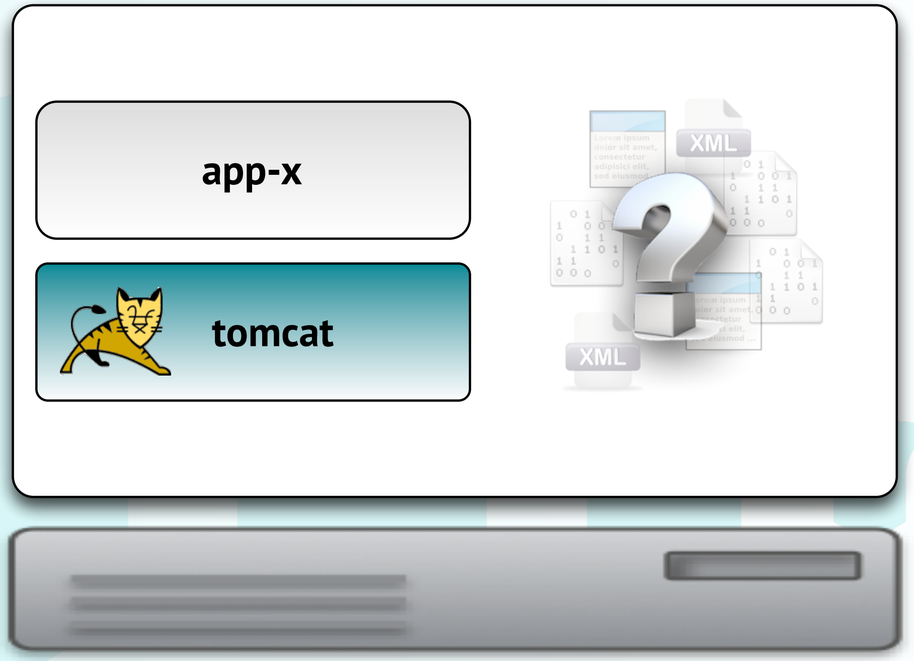
Fear the File System

- Think multi instance
- Shared file system is difficult
- Best practice for any automated deployment

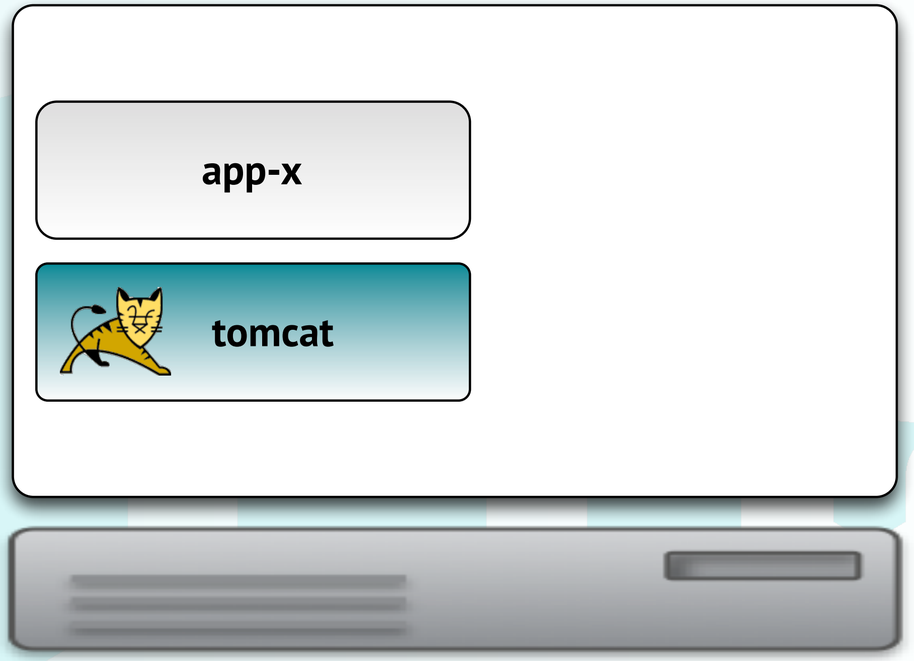
Local file system: ephemeral near-cache or replica

Local File System is Everywhere!

Local file system is everywhere!

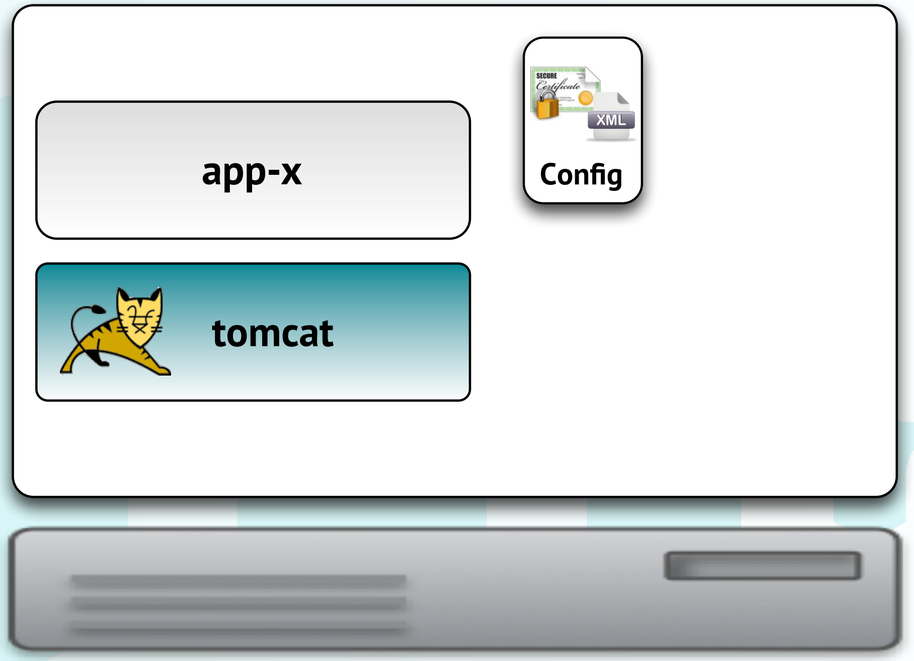


Local File System is Everywhere!



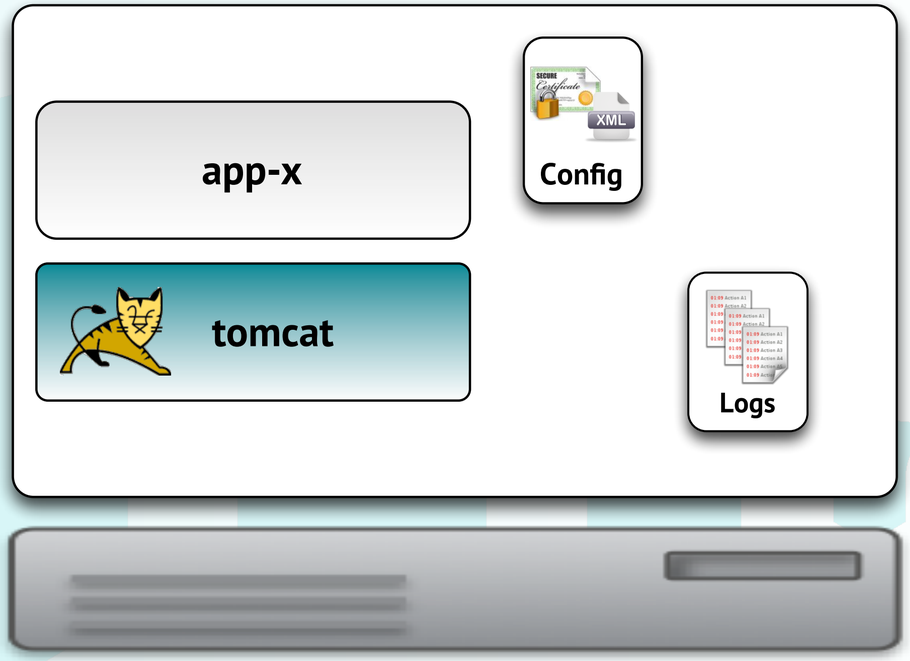
Local File System is Everywhere!

- Configuration files



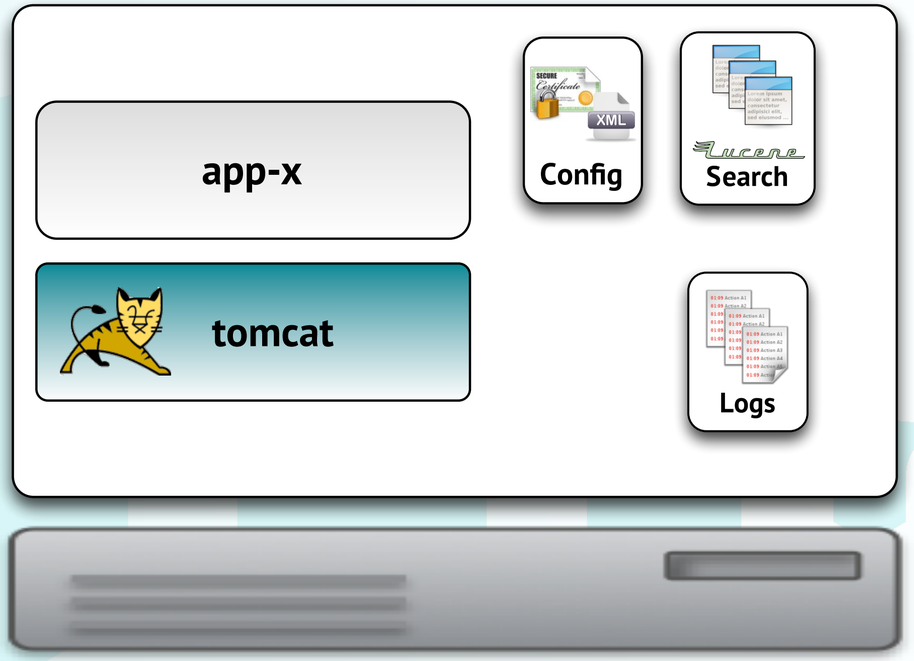
Local File System is Everywhere!

- Configuration files
- Log files



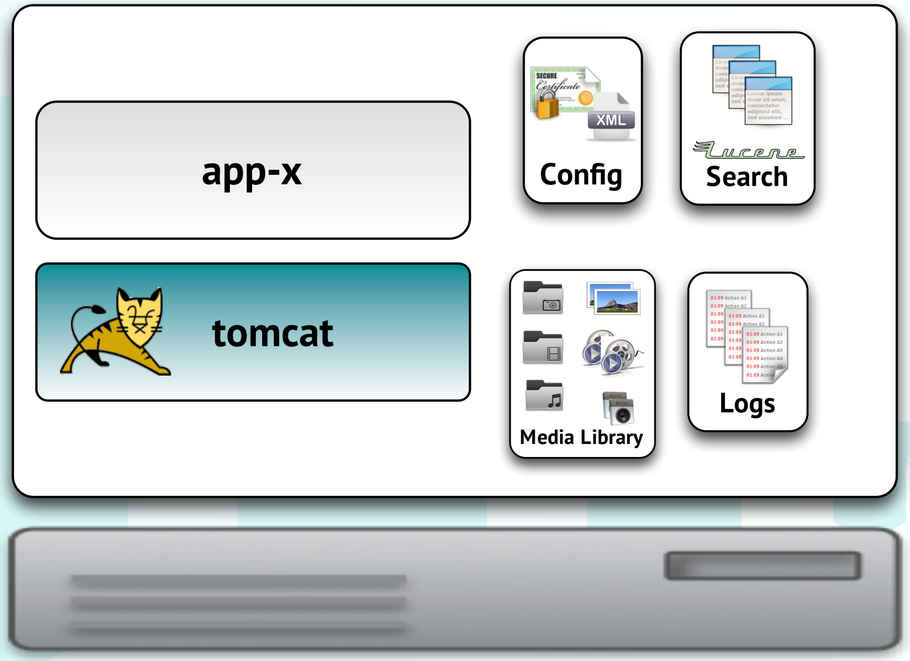
Local File System is Everywhere!

- Configuration files
- Log files
- Full text search

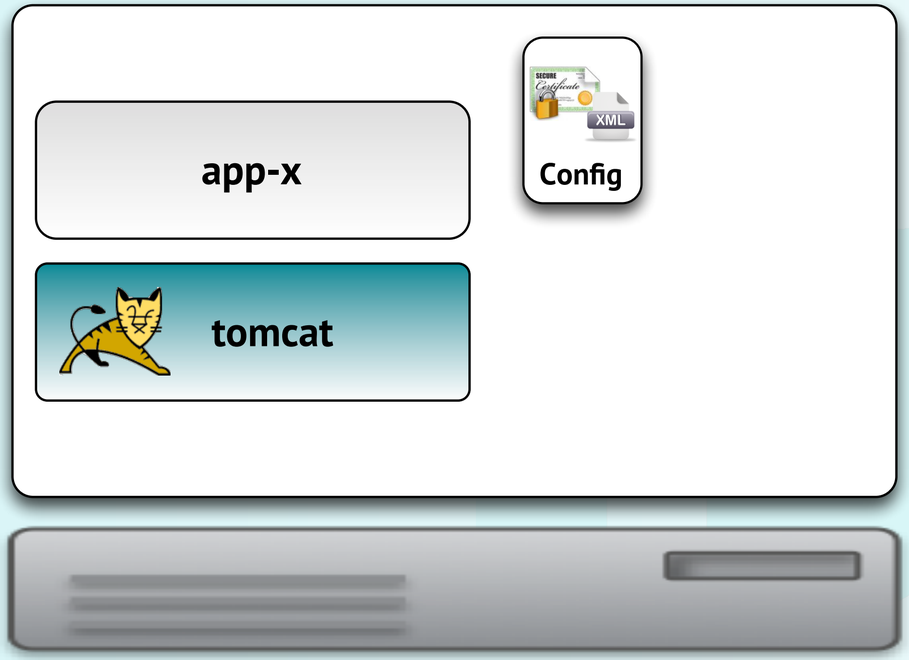


Local File System is Everywhere!

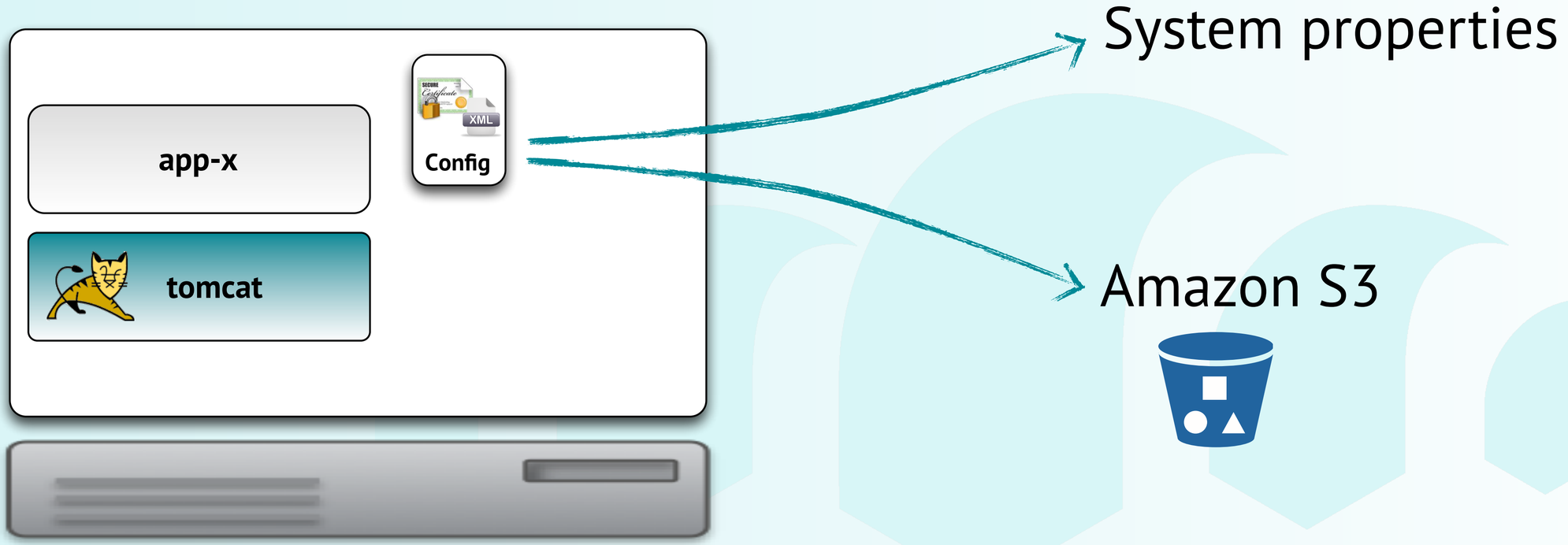
- Configuration files
- Log files
- Full text search
- Media library



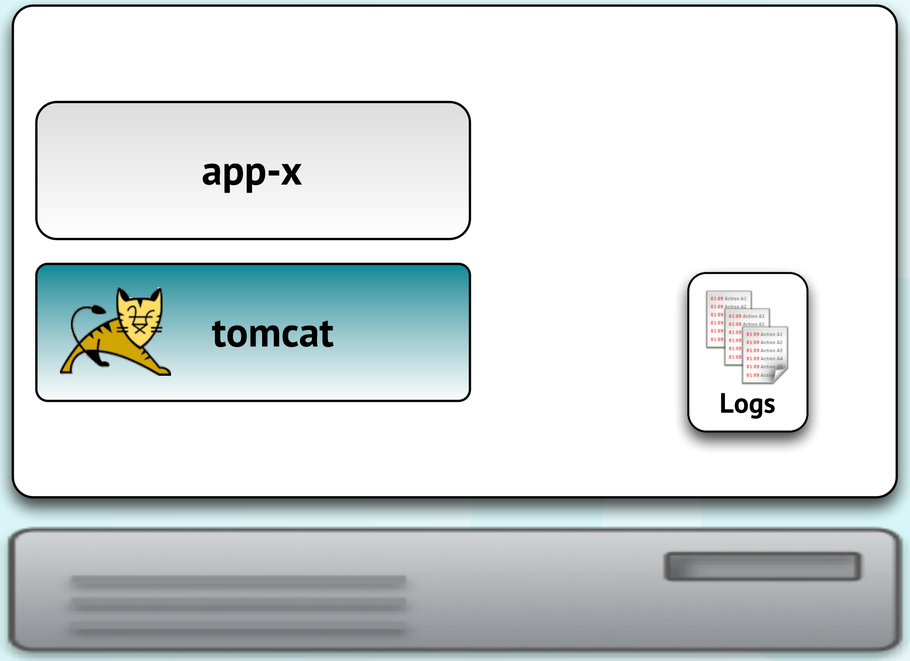
Configuration file



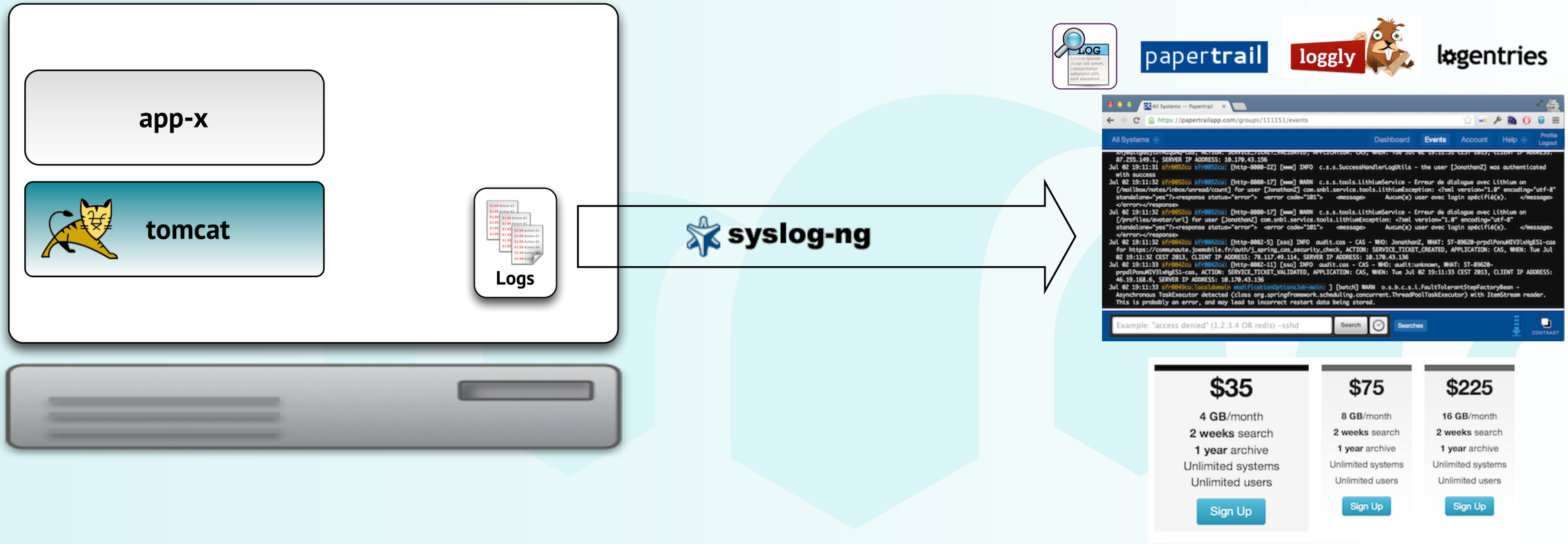
Configuration file



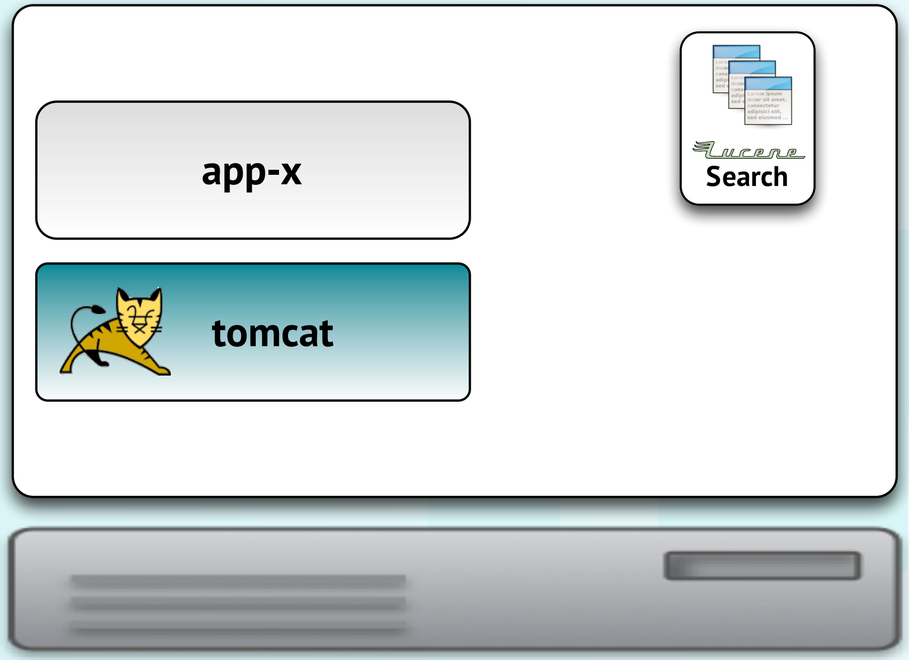
Log files



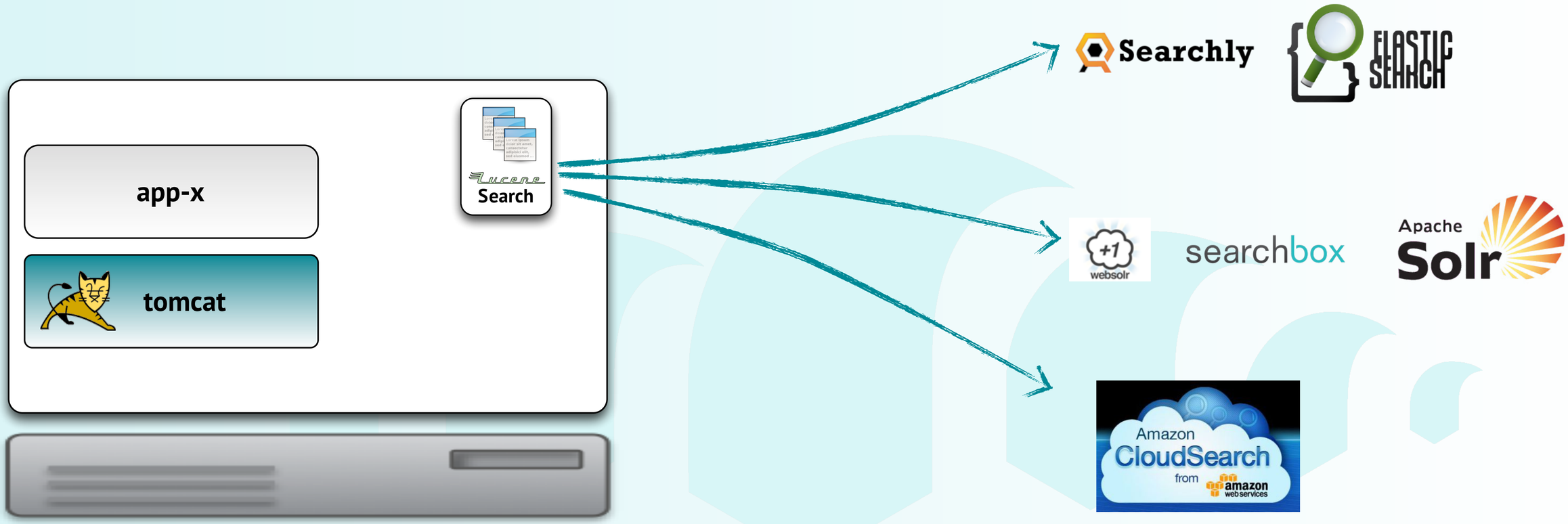
Log files


app-x
tomcat
Logs
syslog-ng
papertrail
loggly
logentries
$35
4 GB/month
2 weeks search
1 year archive
Unlimited systems
Unlimited users
Sign Up
$75
8 GB/month
2 weeks search
1 year archive
Unlimited systems
Unlimited users
Sign Up
$225
16 GB/month
2 weeks search
1 year archive
Unlimited systems
Unlimited users
Sign Up

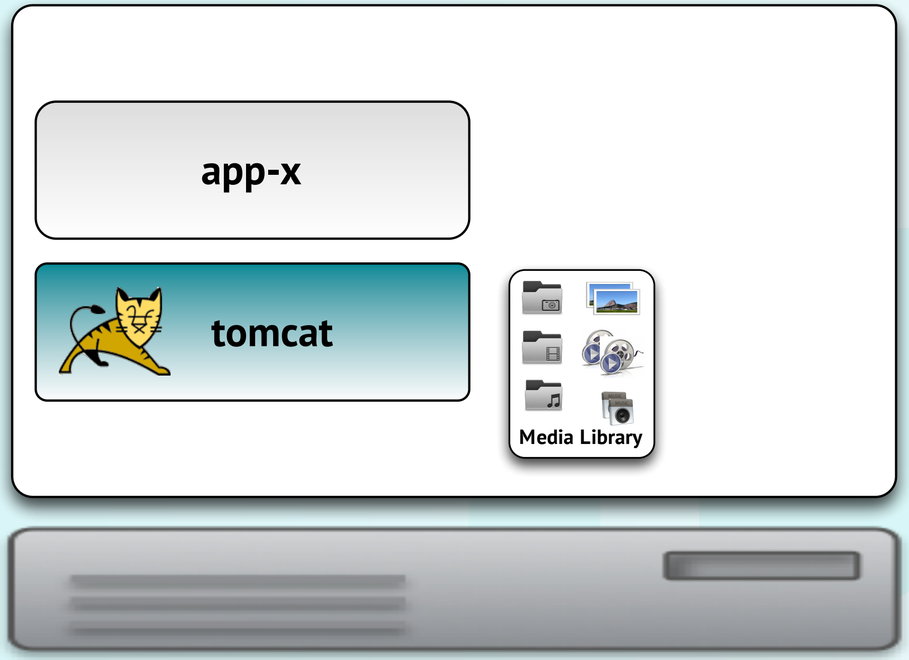
Full Text Search



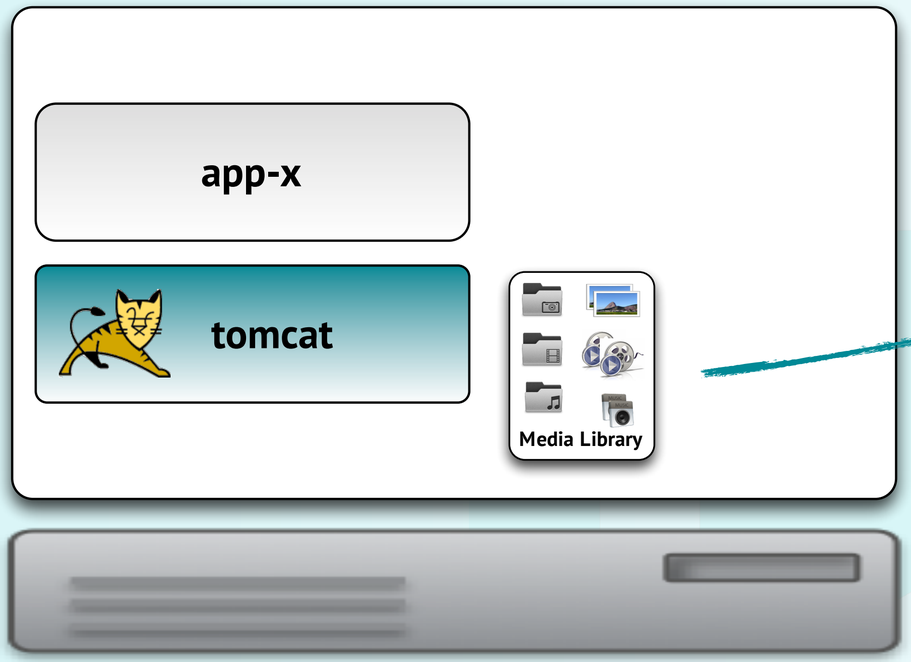
Full Text Search



Media Library

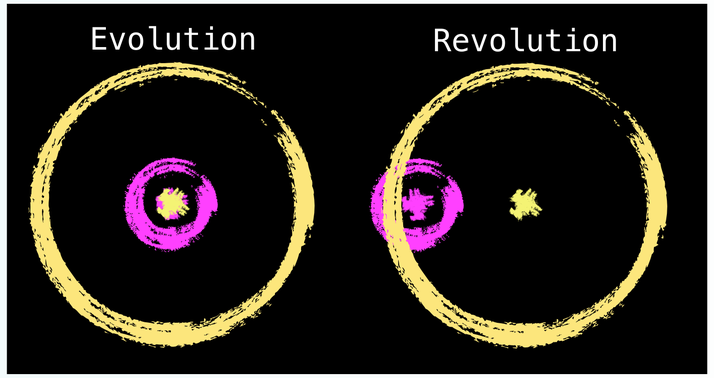


Media Library



Amazon S3

- Direct access from end user
- Amazon S3 Security tokens



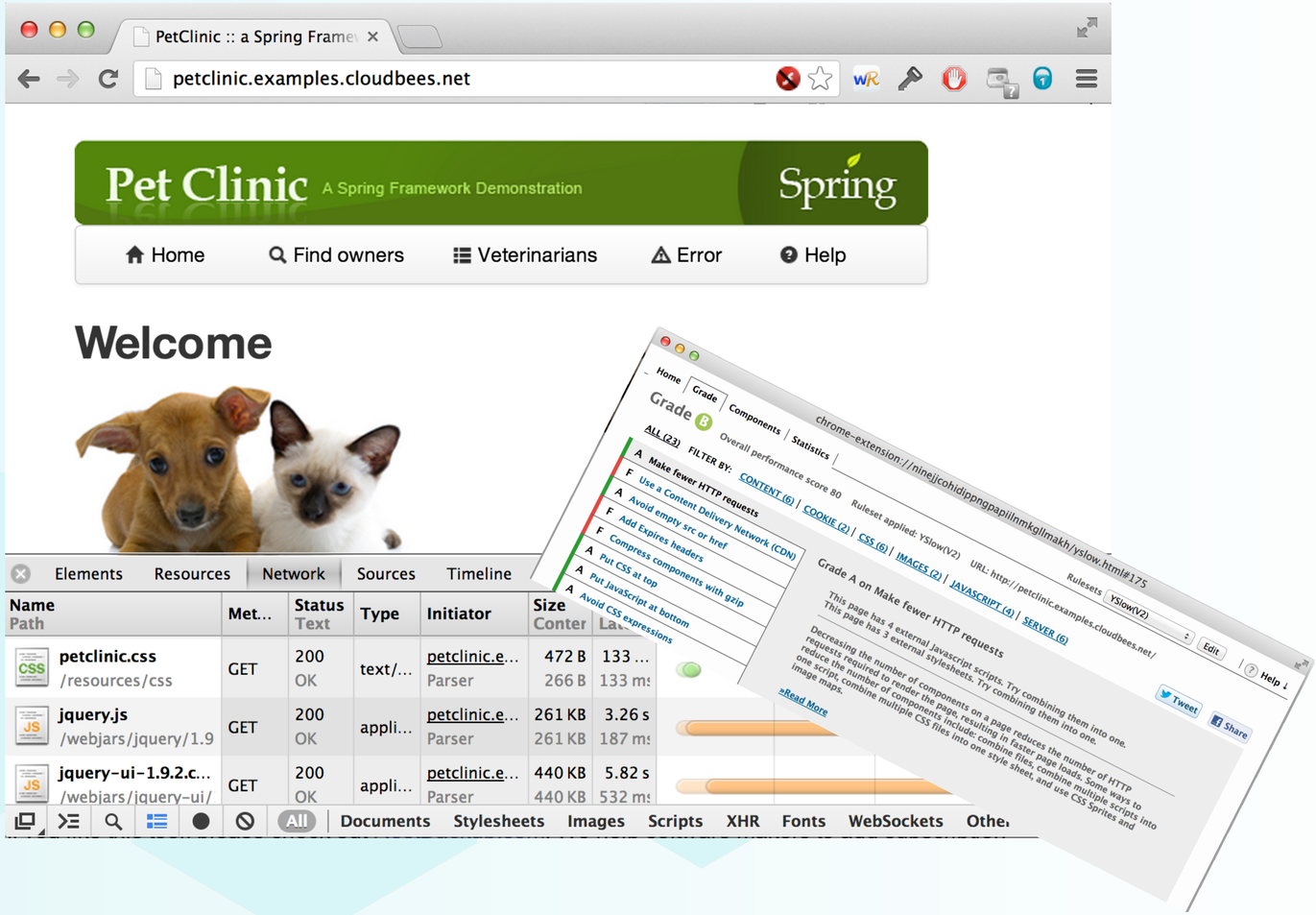
Latency matters!

Latency Matters

- Inter Continental is common
- EU to us-east-1 latency: 120ms

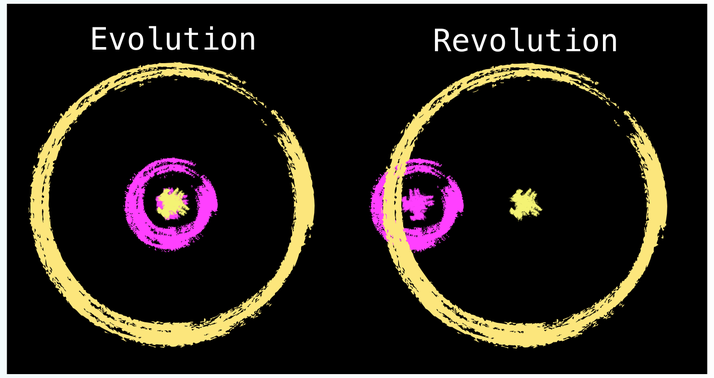
Measure

- Chrome Dev Tools
- Google Pagespeed
- YSlow



Improve

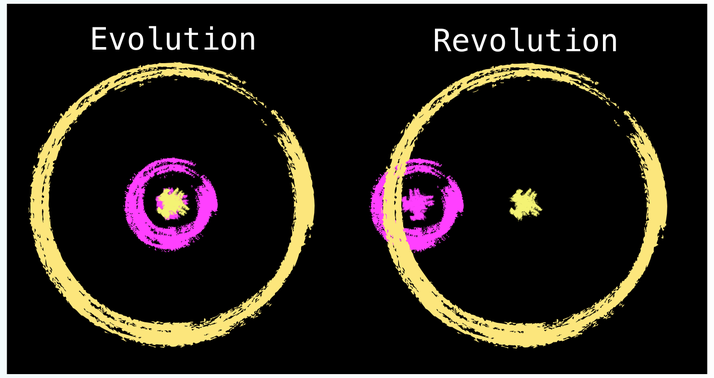
- HTTP Headers: Expires & Cache Control
- Content Delivery Network: AWS CloudFront, CloudFlare ...



Be stateless … if you can

Be stateless … if you can

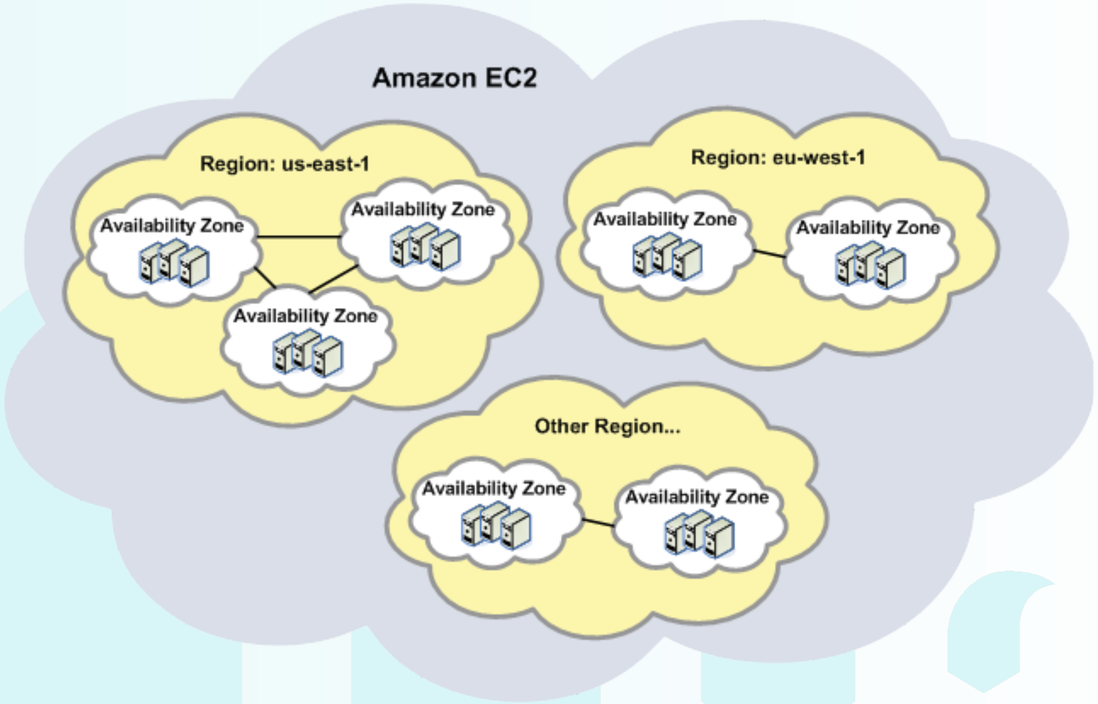
- Stateless design is ideal
  - Scalability, high availability …
- But state is everywhere
- Http Session just works
- Stateless & Web Sockets?



New High Availability Rules

New High Availability Rules

- SAN is slow & not shareable
- Fast disk is “ephemeral”
- Multiple data centers are everywhere
- Servers and storage are infinite



Amazon: regions & availability zones

Conclusion

Conclusion

- Cloud Services Oriented Architecture: **big change**
- Design patterns for the Cloud: mostly **engineering best practices**

Ready for the Cloud!

Questions?

BY NC SA