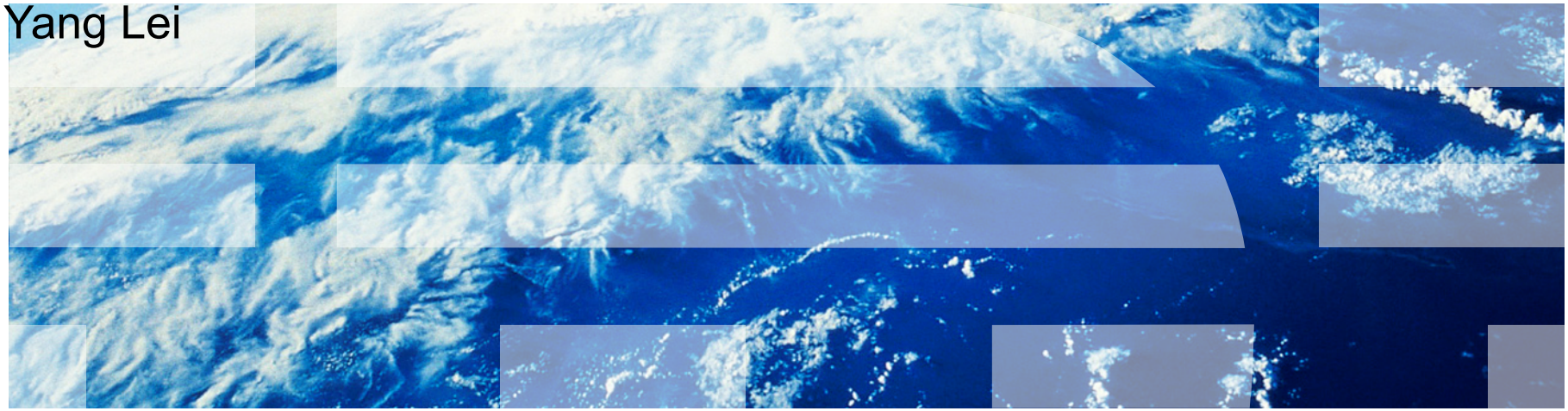
Acme Air

NodeJS Community (June 16th , 2015)

Yang Lei



About the Speaker

- WebSphere Application Server
  EJB CMP/JEE, SCA/SOA
- Emerging Technology Institute
  Workload Optimization for the Cloud
- Advanced Cloud Innovation Solutions
  Big Data Analytics, IoT, Data Center OS

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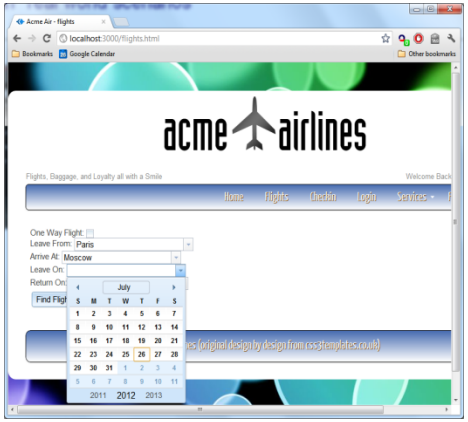
- LinkedIn: https://www.linkedin.com/pub/yang-lei
- Github Acme Air(Java): https://github.com/acmeair/acmeair
- Github Acme Air(NodeJS): https://github.com/acmeair/acmeair-nodejs
- Cloudant and Spark: https://github.com/cloudant/spark-cloudant

Agenda

- Acme Air, the past
  - Web Scale
  - Cloud First
  - Mobile First
  - Benchmark
- Acme Air NodeJS, the Present
  - Micro Services
  - Pluggable Data Access
  - Netflix OSS
  - Continuous Integration

Acme Air / Project Scale Background (2012 --)

- Acme Air the sample
  - Fictitious airline
    - Flight, customer, authentication, baggage services
  - Used extensively within IBM
    - Demonstrate modern multi-channel (Mobile) System of Engagement scenarios
    - Benchmark various DataStore solutions and Cloud Platforms



- Project Scale
  - Benchmarking/performance scalability around Acme Air
  - Acme Air designed to be scalable to “Web Scale” in its services, data implementations with modern architecture

- Cloud First
  - All Acme Air / Project Scale work has been done on cloud (not physical hardware)
  - Run with various cloud approaches: IaaS + RYO services, IaaS + Cloud Services, PaaS, DCOS, Docker

Acme Air IaaS Performance and Scalability (Impact April 2013)

API Billionaires Club

twitter	13 billion API calls / day *(May 2011)*
Google	5 billion API calls / day *(April 2010)*
facebook	5 billion API calls / day *(October 2009)*
NETFLIX	1.4 billion API calls / day *(May 2012)*
ACCU WEATHER	1.1 billion API calls / day *(April 2011)*
KLOUT	1 billion API calls / day *(May 2012)*
ebay	1 billion API calls / day *(Q1 2012)*
Sabre	1 billion API calls / day *(January 2012)*

Source: Programmableweb.com 2012

acme airlines (the benchmark)

Avg/Min/Max Throughput
49,572/48,559/50,472 req/sec

API calls per day: 4.3 Billion

Benchmark Start/End: 013/04/24 04:33:30/04:43:17

Type of Server	Number of Servers
WebSphere Liberty	51
WebSphere eXtreme Scale	47
IBM Worklight	28
Load Balancers	10

Can your application stand up to the mobile and internet of things load?

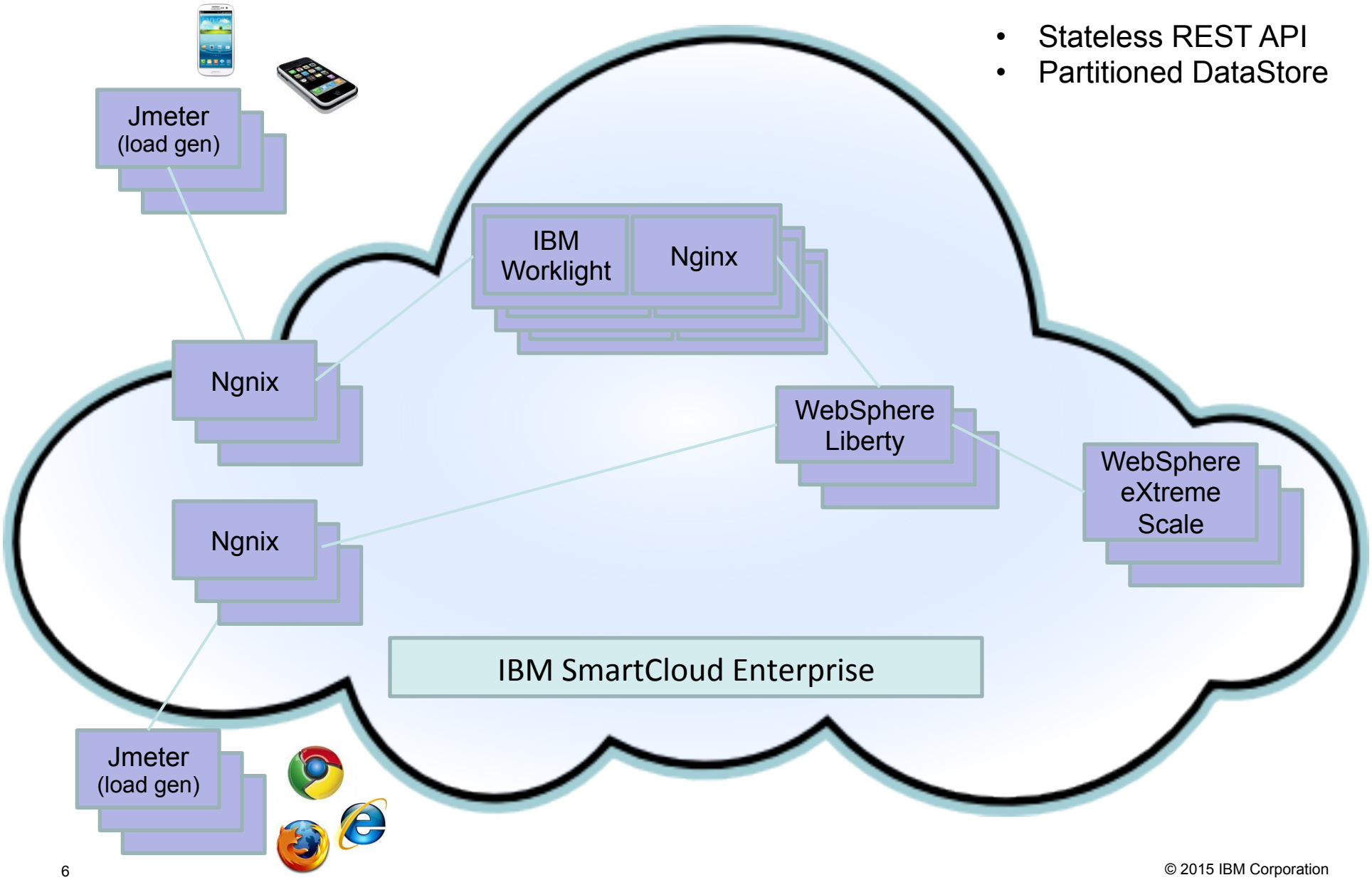
Can your application scale without bounds?

- Performance? Operations?

Learn how to with Acme Air

- Architecture, sample code, performance results, ops practices, and more

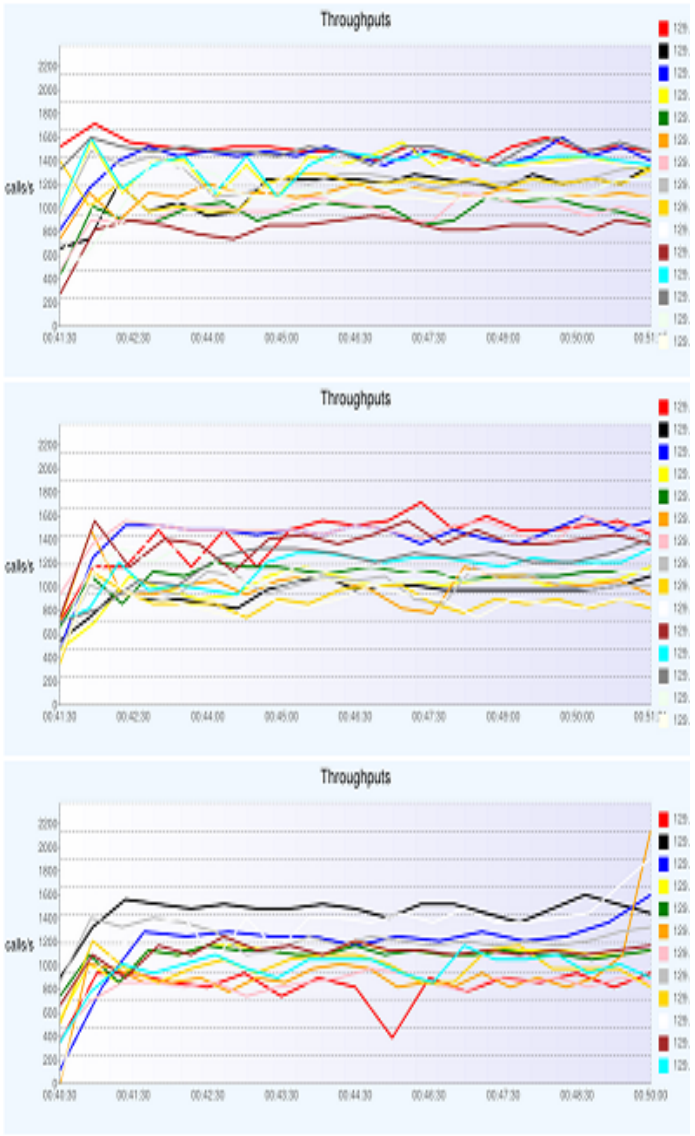
The Topology (Impact April 2013)



- Stateless REST API
- Partitioned DataStore

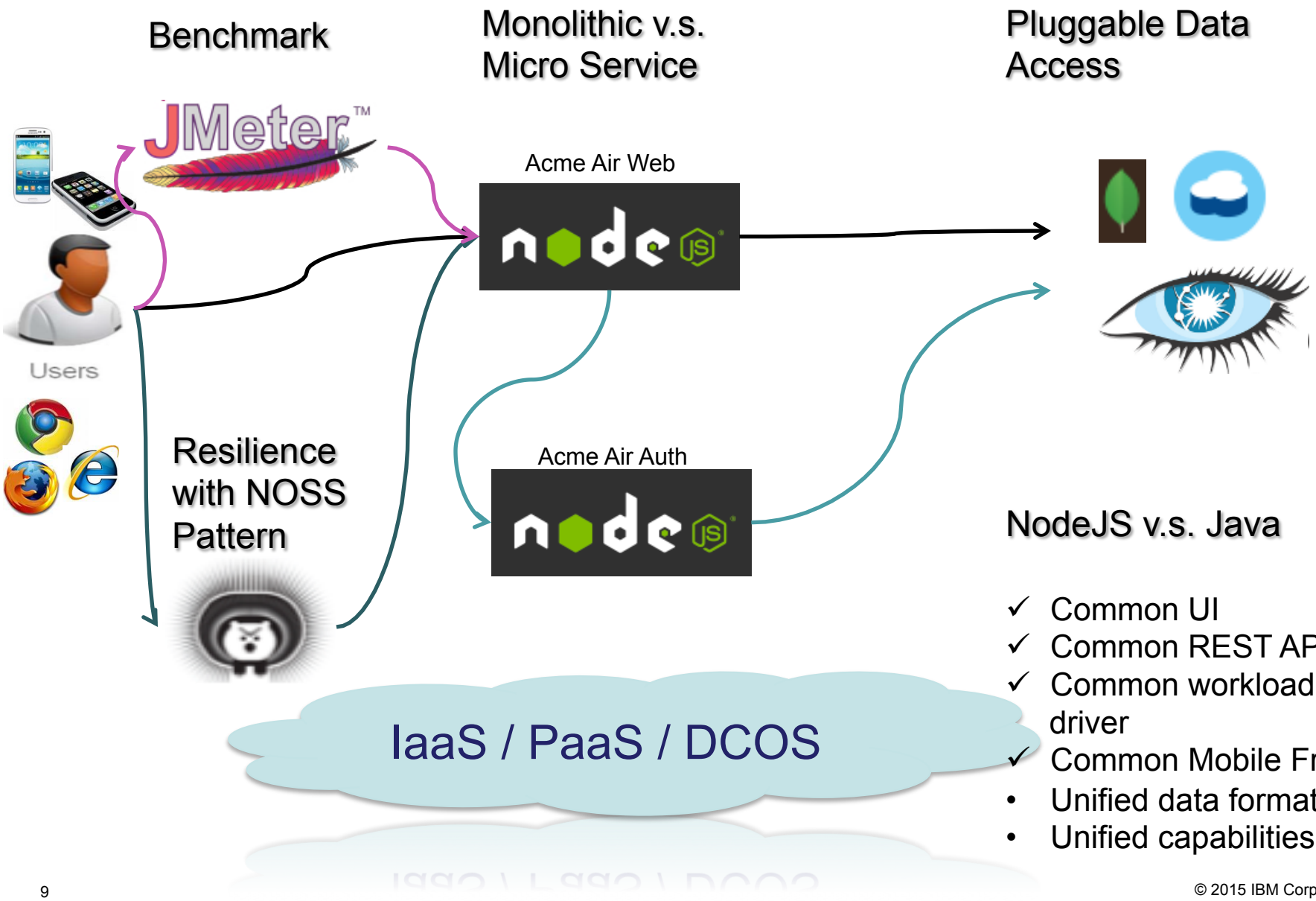
Acme Air As a Benchmark

- Jmeter workload, simulating 70% read v.s. 30% update by accessing application REST API. Configurable preload customer size, default to 10K.
- DevOps script to kickoff benchmark run on remote VMs and start resource usage sample (nmon, cf app cmd on bluemix)
- DevOps script to collect the benchmark run results and statistic data (nmon, cf app…)
- Java Reporter to aggregate the benchmark throughput/latency , resource utilization(CPU, Memory, Network I/O, disk I/O) into a graph over timeline. Latency is also breakdown by URI



DEMO

Acme Air Node JS Overview



NodeJS v.s. Java

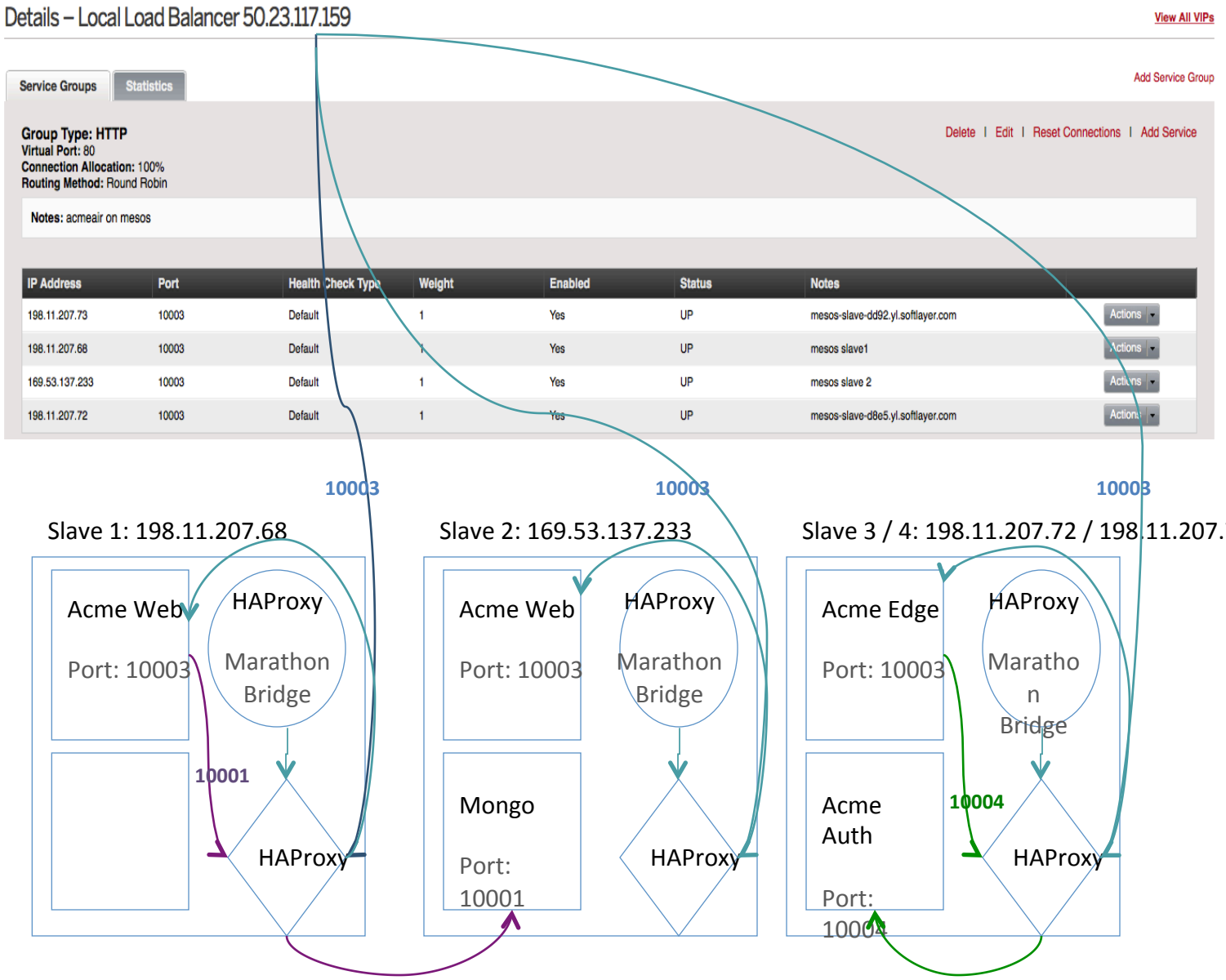
- ✓ Common UI
- ✓ Common REST API
- ✓ Common workload driver
- ✓ Common Mobile Front
- • Unified data format
- • Unified capabilities

Acme Air on Data Center OS: Docker over Mesos on Softlayer

Front End Load Balancer on Softlayer

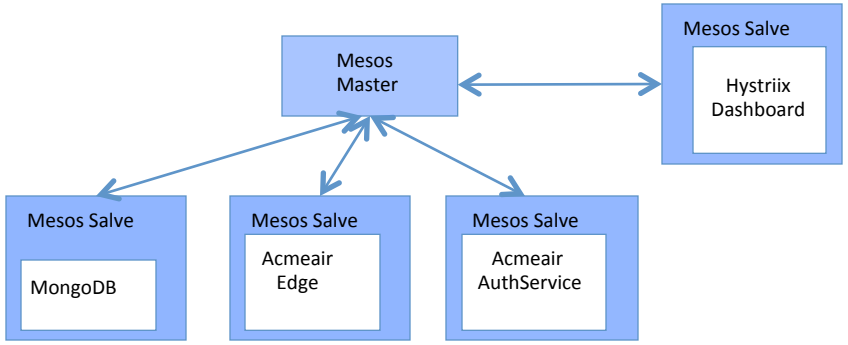
Service Discovery and Load Balance through HAProxy

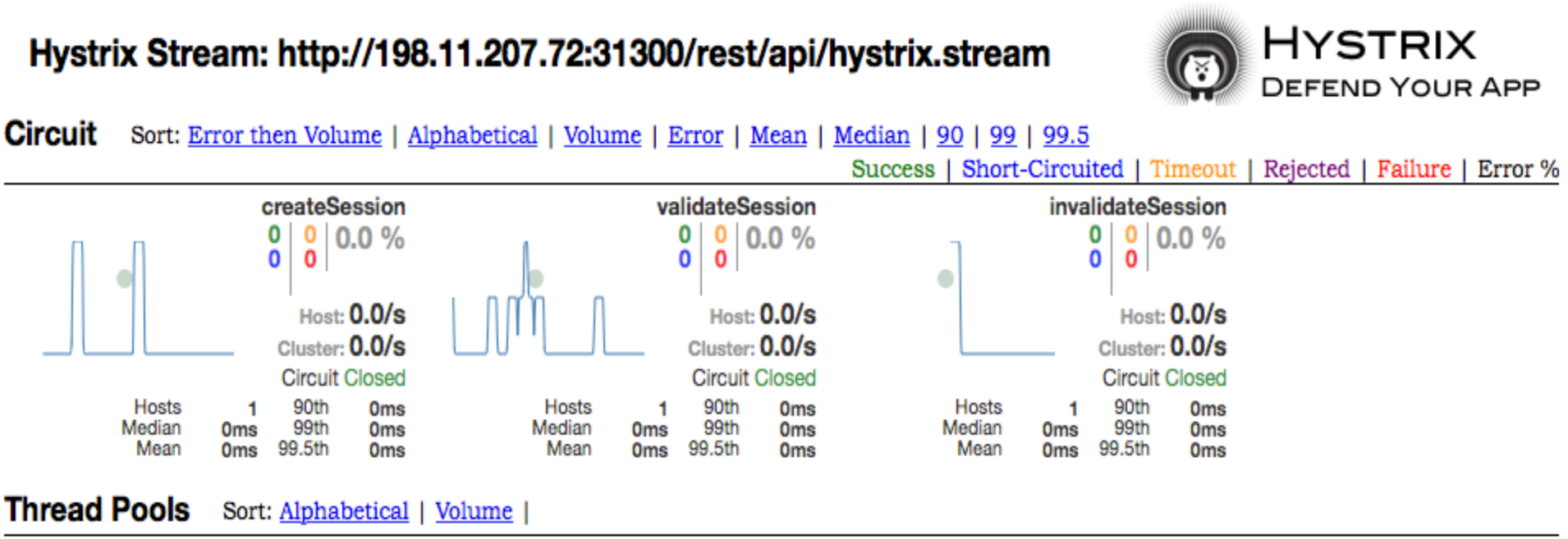
- Marathon Concept of Service Port



Acme Air Micro Service Resilience: NOSS Pattern

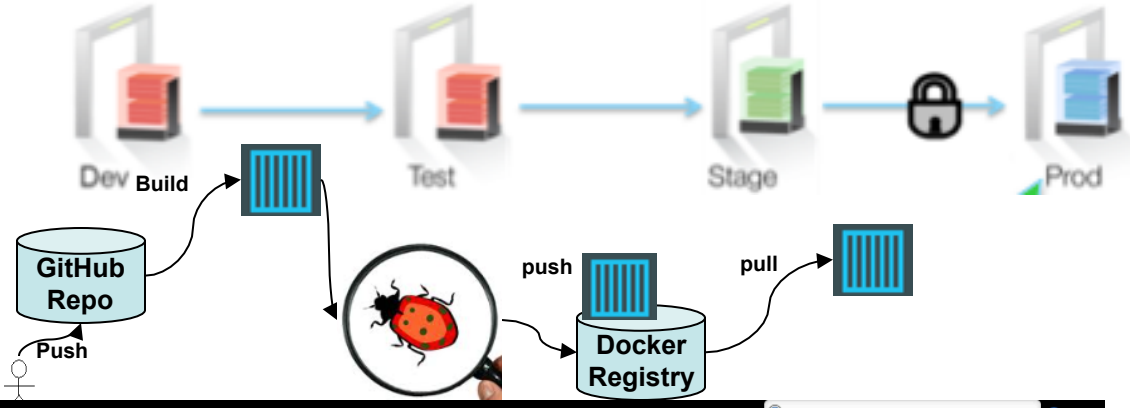
- Cmd/CicuitBreaker pattern
- Metrics in NOSS Hystrix stream format
- Hystrix Dashboard Integration

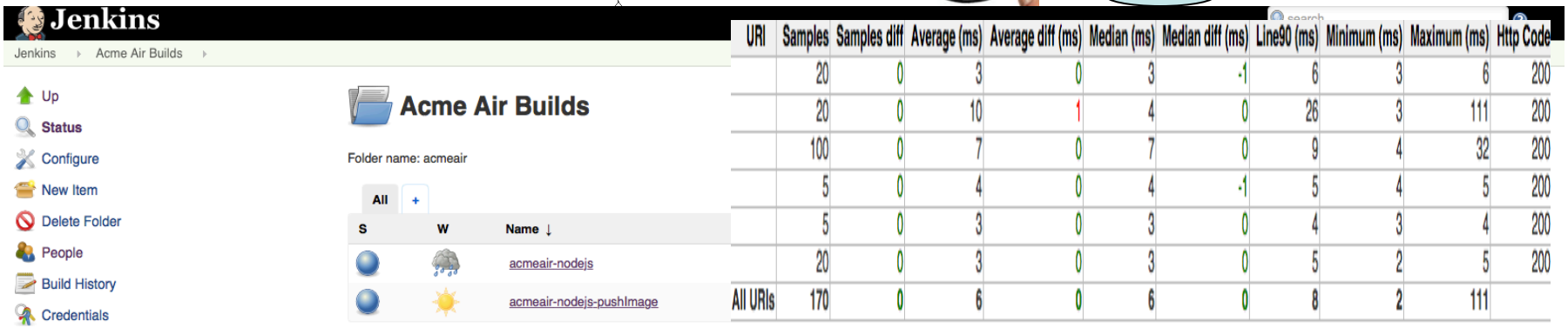




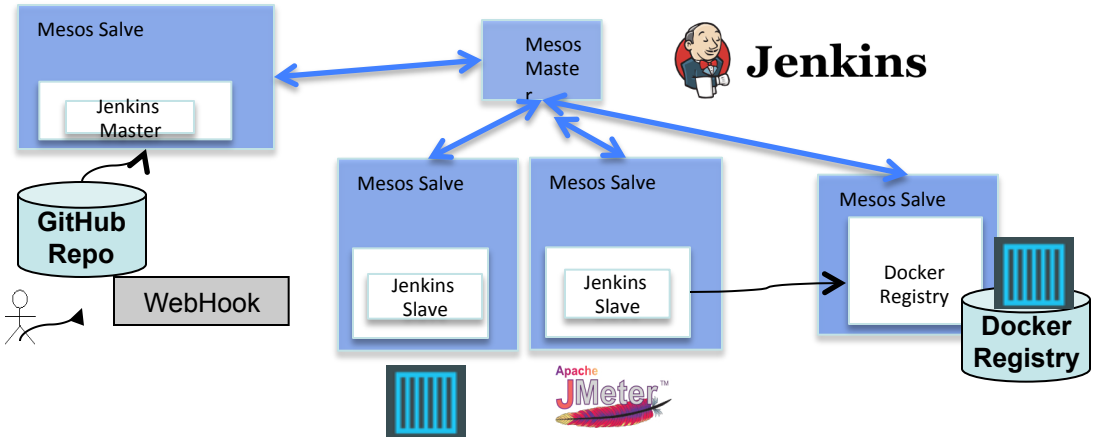
Acme Air with Continuous Integration / Delivery

- Streamline development, test through automation
- On-demand resource allocation





URI	Samples	Samples diff	Average (ms)	Average diff (ms)	Median (ms)	Median diff (ms)	Line90 (ms)	Minimum (ms)	Maximum (ms)	Http Code
	20	0	3	0	3	-1	6	3	6	200
	20	0	10	1	4	0	26	3	111	200
	100	0	7	0	7	0	9	4	32	200
	5	0	4	0	4	-1	5	4	5	200
	5	0	3	0	3	0	4	3	4	200
	20	0	3	0	3	0	5	2	5	200
All URIs	170	0	6	0	6	0	8	2	111	



- Jenkins Master Managed by Marathon for availability
- On-demand Jenkins Slave for Job Execution

Recap

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THANK YOU!

Backup

Acme Air in Mobile