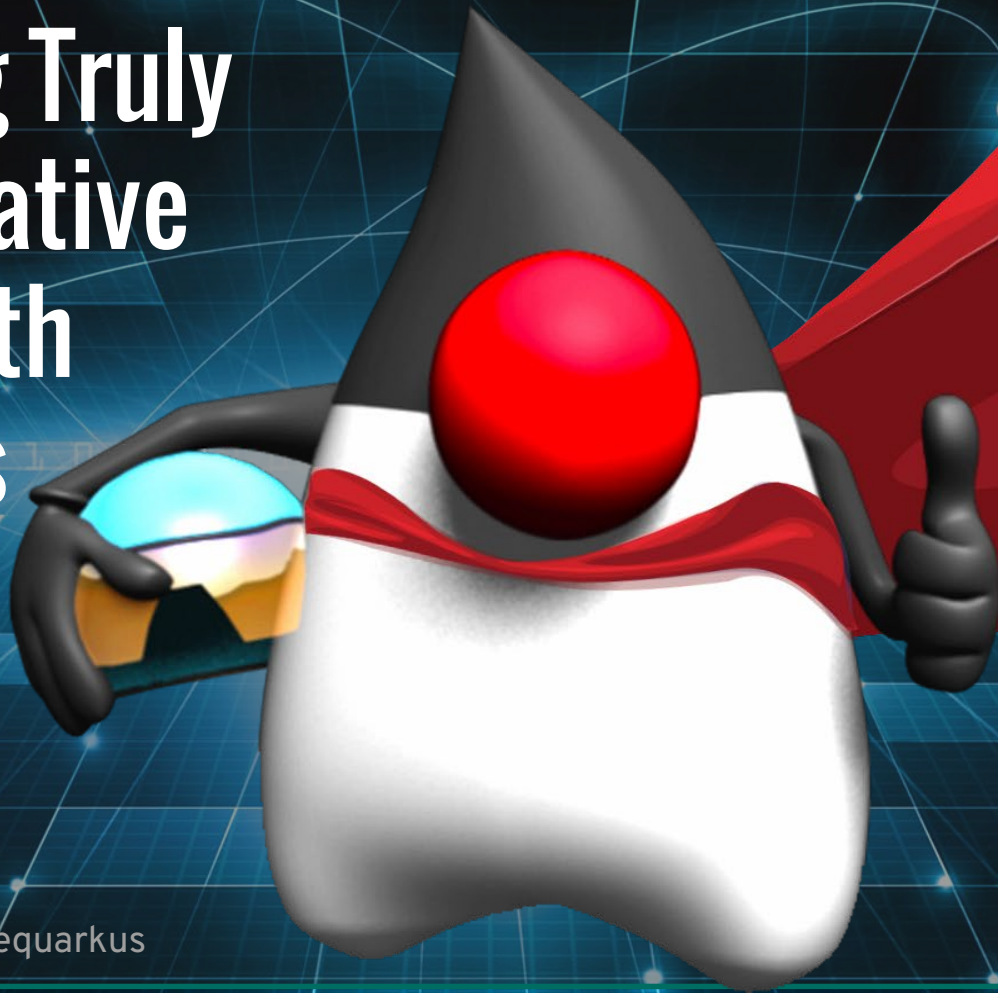


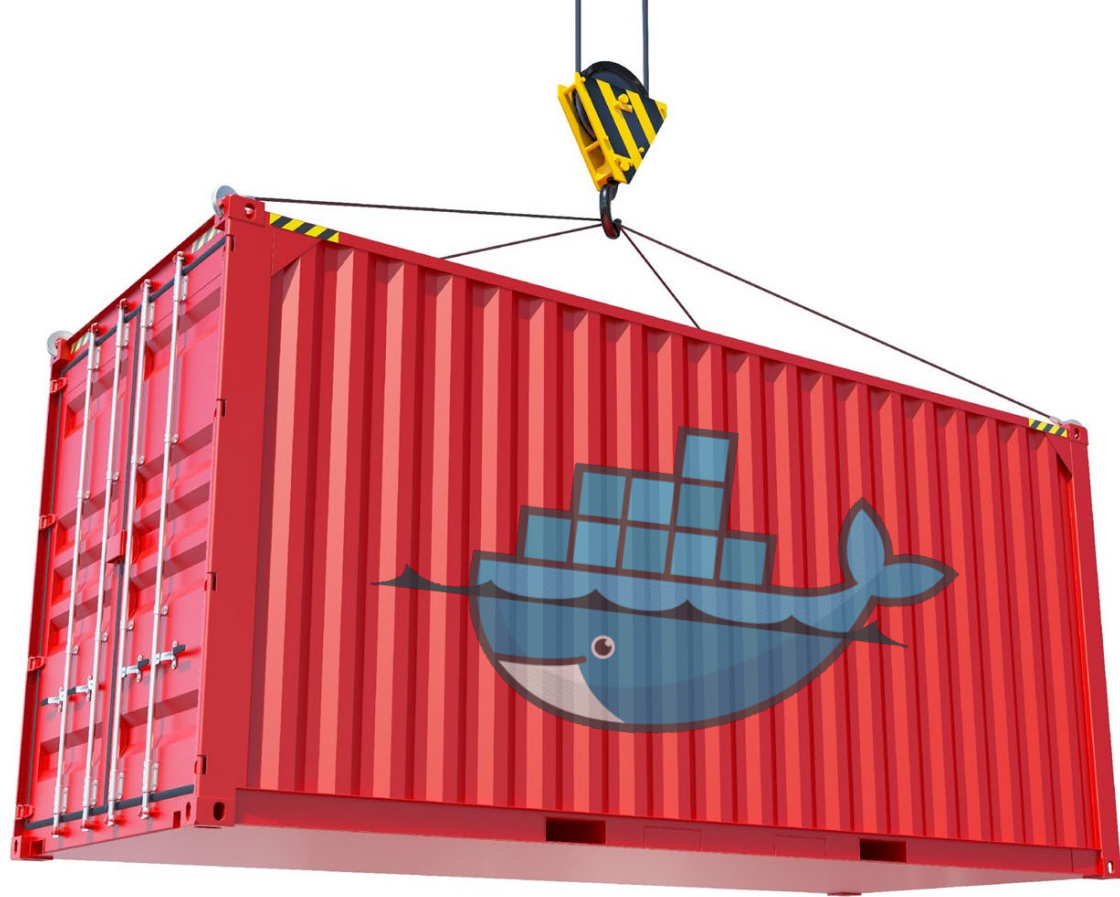
Building Truly Cloud Native Apps with Quarkus

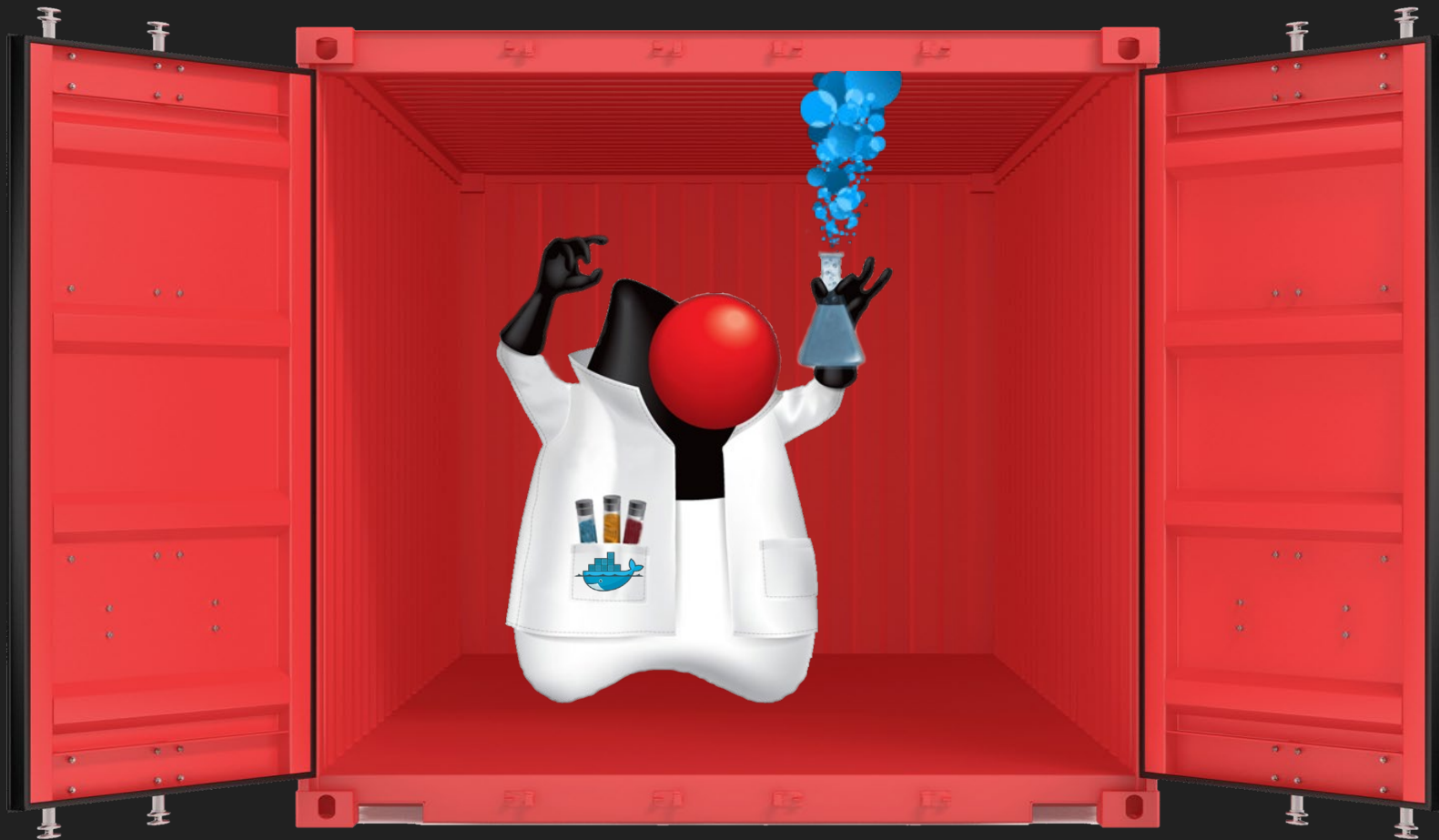
QUARKUS.IO

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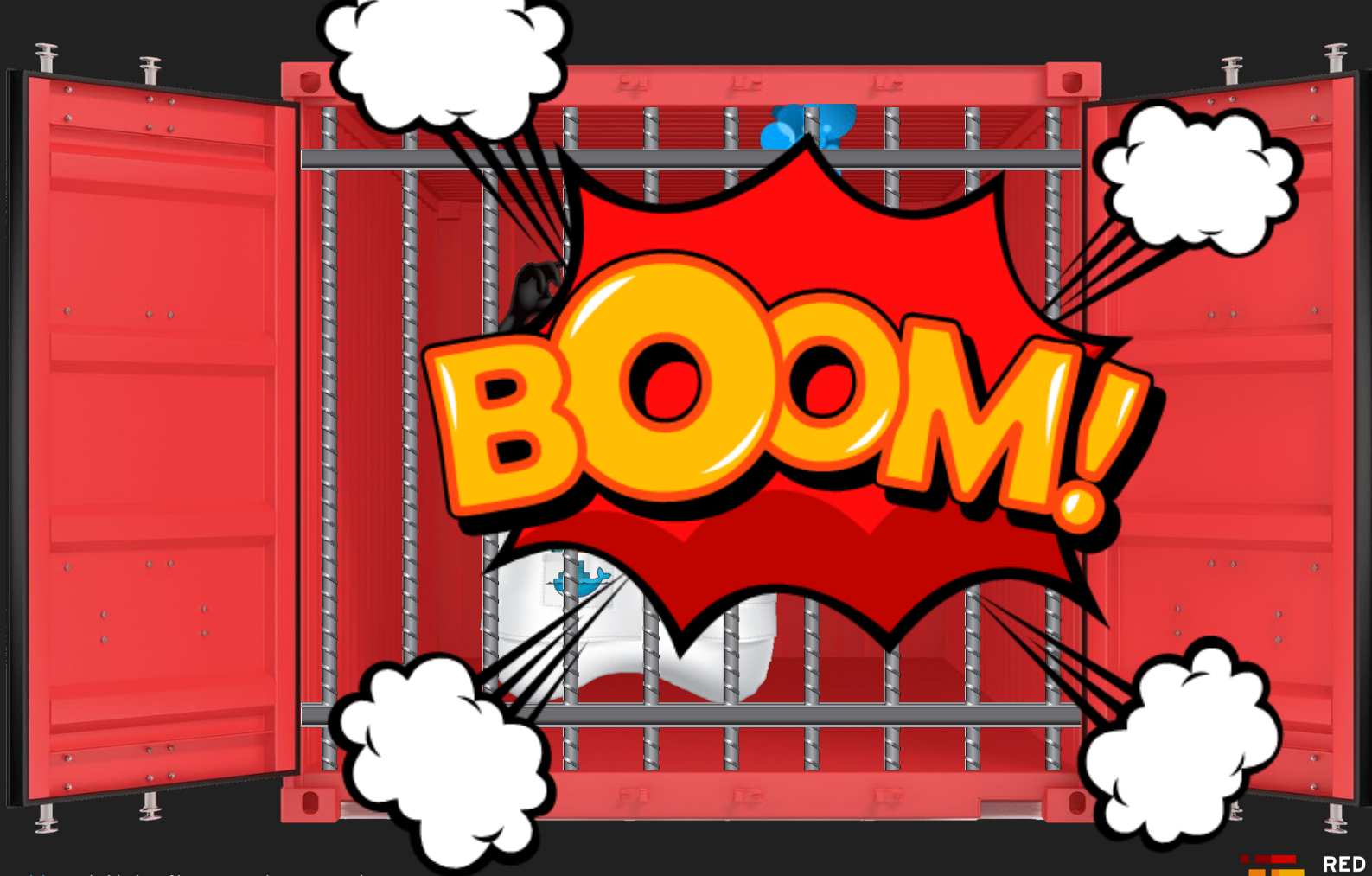


RED HAT
DEVELOPER















Only 11% of organizations across industries indicated their existing in-house talent has the competitive skills necessary for success in the digital economy.

MIT Sloan Management Review, 2016

Digital Darwinism

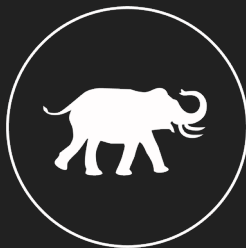
An Organizational Journey



Re-Org to
DevOps



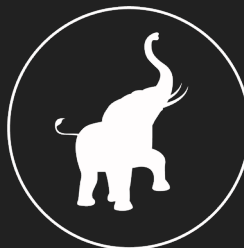
Self-Service,
On-Demand,
Elastic
Infrastructure



Automation
Puppet, Chef,
Ansible,
Kubernetes



CI & CD
Deployment
Pipeline



Advanced
Deployment
Techniques



Microservices
(and flying
elephants!)

Force Multipliers & Superpowers

Wonder Woman Style

Boomerang
Tiara



Re-Org to
DevOps

Indestructible
Bracelets



Self-Service,
On-Demand,
Elastic
Infrastructure

Lasso of
Truth



Automation
Puppet, Chef,
Ansible,
Kubernetes

Amazonian
Shield



CI & CD
Deployment
Pipeline

Hand-to-
Hand Combat



Advanced
Deployment
Techniques

Superhuman
Strength



Microservices



Journey to Awesomeness

DevOps



Self-Service,
On-Demand,
Elastic
Infrastructure



Automation



CI & CD
Deployment
Pipeline



Advanced
Deployment
Techniques



Microservices

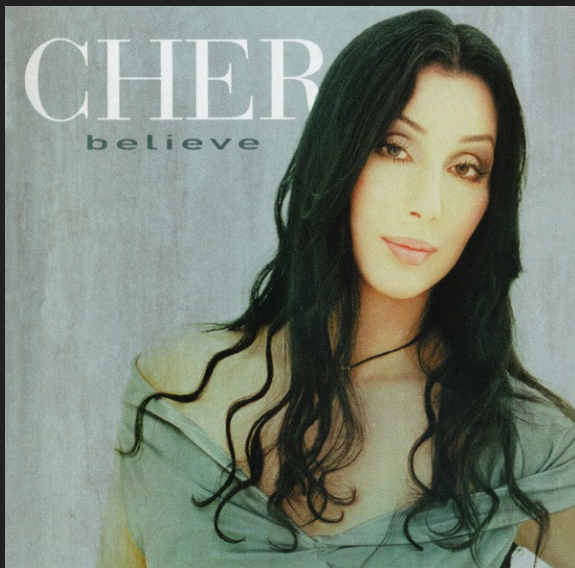


1999

1999



1999



#3 "Angel of Mine" - Monica

#4 "Heartbreak Hotel" - Whitney Houston

#5 "Baby One More Time" - Britney Spears

https://en.wikipedia.org/wiki/Billboard_Year-End_Hot_100_singles_of_1999

1999

USA Wins FIFA World Cup



1999



<https://www.si.com/soccer/video/2016/03/02>

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Cost of a Java-based Web App circa 1999

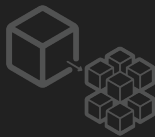
\$18,000 Sun Sparc App Server Box (4 CPUs, 2GB of RAM)
+ \$60,000 BEA Weblogic
+ \$92,000 Sun Spark DB Server Box (8 CPUs)
+ \$243,000 Oracle RDBMS
+ \$50,000 Symantec Visual Café for 10 developers

\$463,000 (capex) + ~\$80,000 annual maint (opex)

m5ad.4xlarge	16	N/A	64 GiB	2 x 300 NVMe SSD	\$0.824 per Hour
m5ad.12xlarge	48	N/A	192 GiB	2 x 900 NVMe SSD	\$2.472 per Hour
m5ad.24xlarge	96	N/A	384 GiB	4 x 900 NVMe SSD	\$4.944 per Hour
m5d.large	2	8	8 GiB	1 x 75 NVMe SSD	\$0.113 pe
m5d.xlarge	4	16	16 GiB	1 x 150 NVMe SSD	\$0.226 pe
m5d.2xlarge	8	31	32 GiB	1 x 300 NVMe SSD	\$0.452 pe

MEMORY	VCPUS	SSD DISK	TRANSFER	PRICE
1 GB	1 vCPU	25 GB	1 TB	\$5/mo \$0.007/hr
2 GB	1 vCPU	50 GB	2 TB	\$10/mo \$0.015/hr
3 GB	1 vCPU	60 GB	3 TB	\$15/mo \$0.022/hr
2 GB	2 vCPUs	60 GB	3 TB	\$15/mo \$0.022/hr
1 GB	3 vCPUs	60 GB	3 TB	\$15/mo \$0.022/hr
4 GB	2 vCPUs	80 GB	4 TB	\$20/mo \$0.030/hr
8 GB	4 vCPUs	160 GB	5 TB	\$40/mo \$0.060/hr
16 GB	6 vCPUs	320 GB	6 TB	\$80/mo \$0.119/hr

INSTANCE	VCPU	RAM	TEMPORARY STORAGE	PAY AS YOU GO
D2 v3	2	8 GiB	50 GiB	\$0.096/hour
D4 v3	4	16 GiB	100 GiB	\$0.192/hour
D8 v3	8	32 GiB	200 GiB	\$0.384/hour



NETFLIX



2010
NETFLIX
TO AWS



3/2012
HYSTRIX

NETFLIX
RIBBON

3/2012
RIBBON



3/2013
DOCKER



6/2014
KUBERNETES

2015



1997
HTTP 1.1



2000
RED HAT
LINUX



2001
AGILE
MANIFESTO



2006
AWS EC2



2009
JAVA EE6



6/2011
VERT.X



3/2012
MICROSERVICES
ASSESS,
THOUGHTWORKS
RADAR



9/2013
SPRING
BOOT



3/2014
MICROSERVICES
DEFINED,
THOUGHTWORKS,
FOWLER, LEWIS

NETFLIX
EUREKA

7/2012
EUREKA



2009
DEVOPS



5/2011
DROPWIZARD



2007
KVM

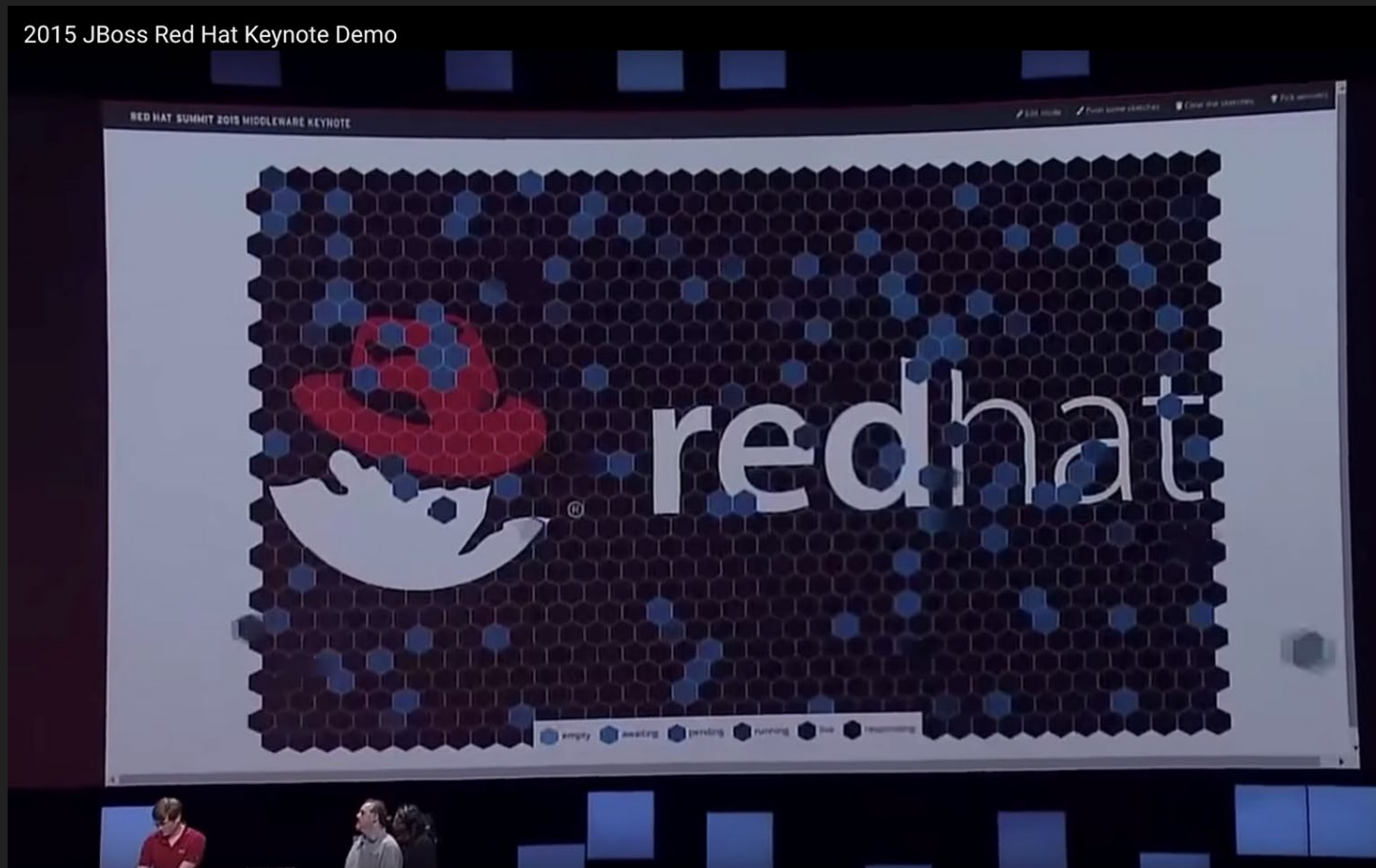


2000
FREE BSD
JAILS

1996
JAVA 1.0

1995





2015

Launch 1000+
Containers

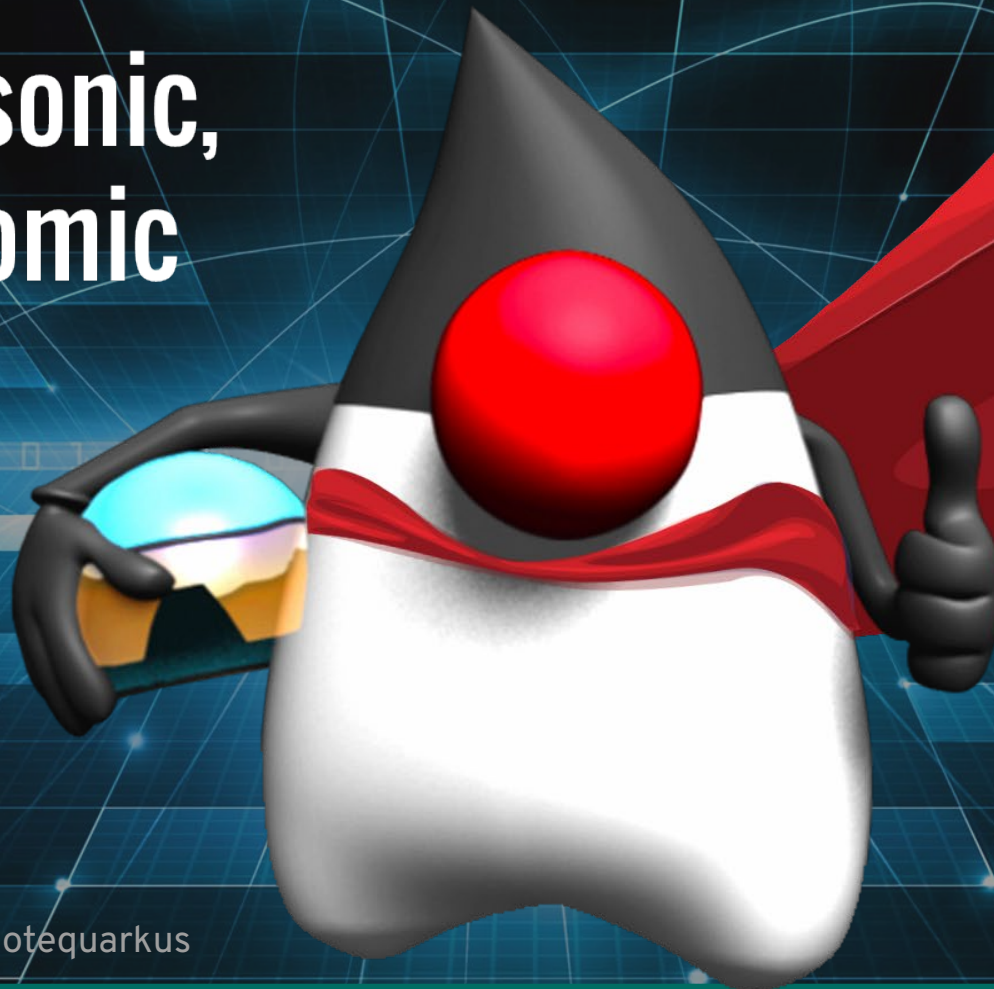
Audience
Claims a
Container

<https://www.youtube.com/watch?v=GCtpncA0Ea0&feature=youtu.be&t=1031>

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Supersonic, Subatomic Java

QUARKUS.IO



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**“The reports of my
death are greatly
exaggerated.”**

@bursutter bit.ly/keynotequan



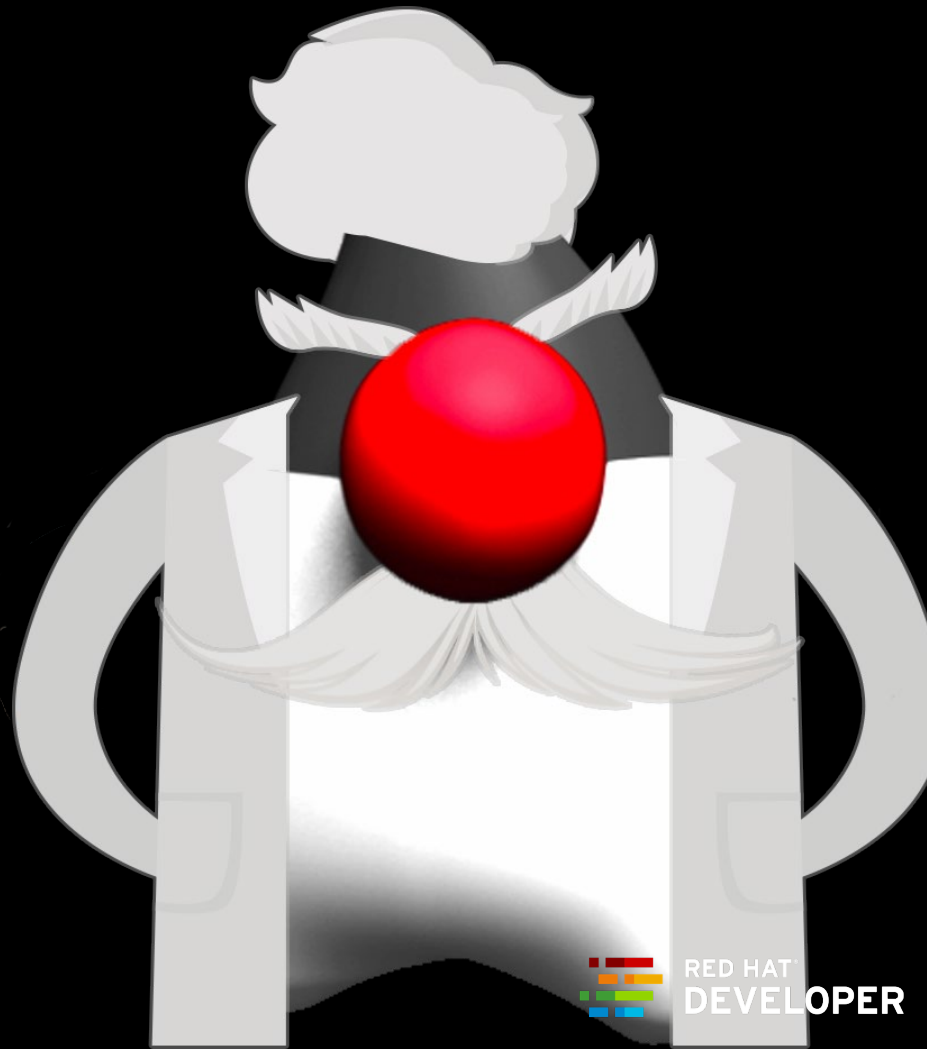
"Today, Java is old hat."

Computer World, May 22, 2006

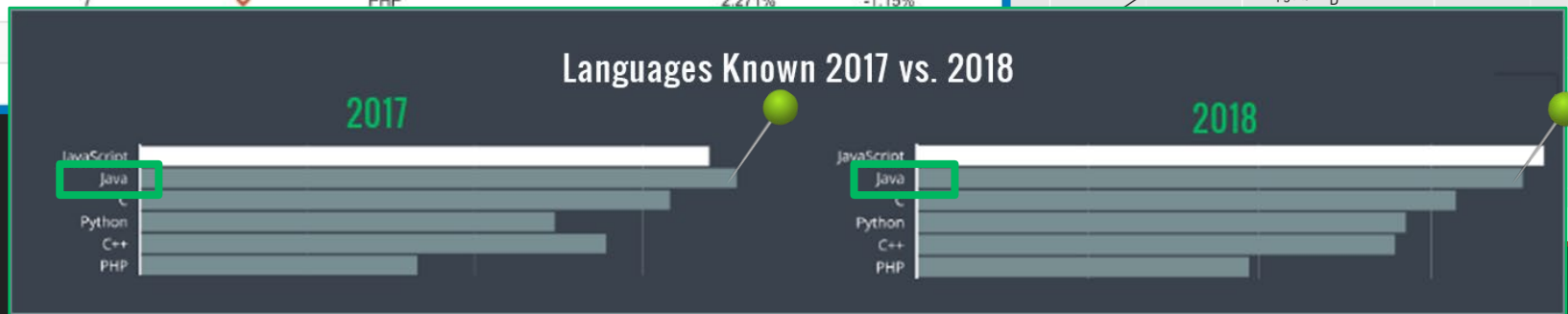
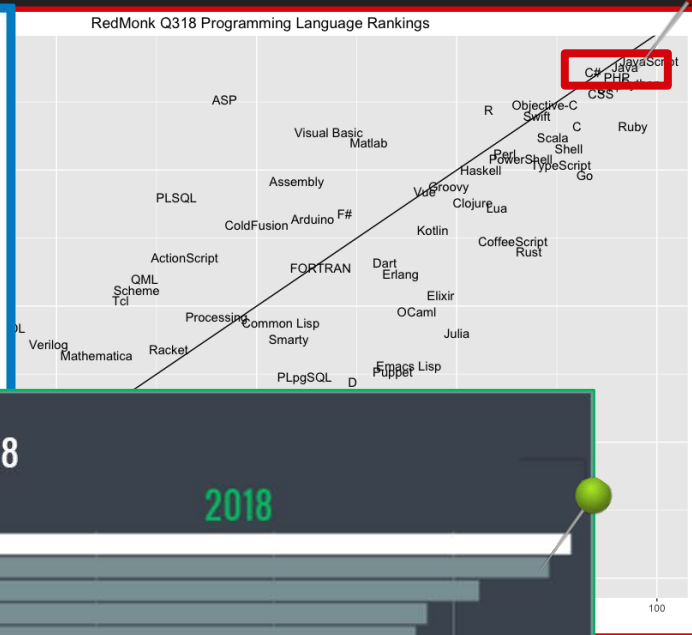
FRANK HAYES ■ FRANKLY SPEAKING

Not Dead Yet

IS JAVA DEAD? Come on, seriously — why else would Sun Microsystems be offering it up to the open-source crowd? (See story, page 1.) A decade ago, Java was the hottest, most exciting thing in IT, a certified Windows-killer that was going to wipe out Microsoft's monopoly and revolutionize the way software was made, distributed and run. Today? Today, Java is old hat. It's been eclipsed by open-source, the *new* hottest thing in IT that's going to wipe out Microsoft's monopoly and revolutionize the way software is made, distributed and run.



Feb 2019	Feb 2018	Change	Programming Language	Ratings	Change
1	1		Java	15.876%	+0.89%
2	2		C	12.424%	+0.57%
3	4	▲	Python	7.574%	+2.41%
4	3	▼	C++	7.444%	+1.72%
5	6	▲	Visual Basic .NET	7.095%	+3.02%
6	8	▲	JavaScript	2.848%	-0.32%
7	5	▼	C#	2.346%	-1.61%
8	7	▼	PHP	2.271%	-1.15%
9					
10					





Still, so much goodness ...





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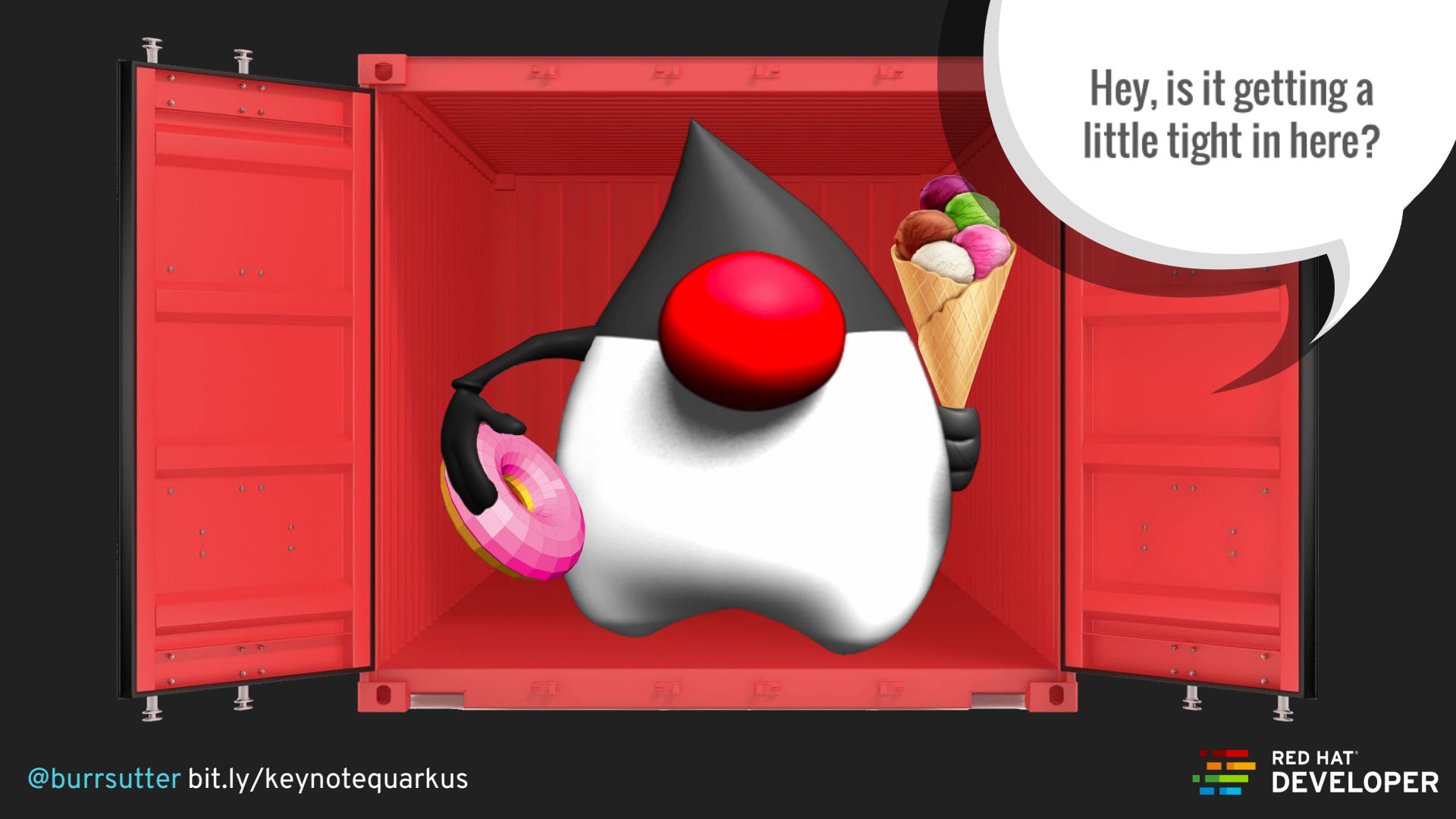




In so many flavors ...



So so many flavors ...



Hey, is it getting a
little tight in here?





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Meet Quarkus

Supersonic Java



So who is this Quarkus— and what's all the fuss?



Up to 10x smaller, 100x
faster.
Seriously.



developer
Enough ^ love to go around.



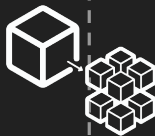
Live reload



Imperative and
reactive



Serverless



Microservices



Fat jars
and native
executables



Optimized for
JAX-RS & JPA
(Hibernate) ...



ECLIPSE VERT.X



HIBERNATE



RESTEASY



APACHE CAMEL



ECLIPSE
MICROPROFILE



NETTY



KUBERNETES



OPENSIFT

OPENSIFT



JAEGER



PROMETHEUS



APACHE KAFKA

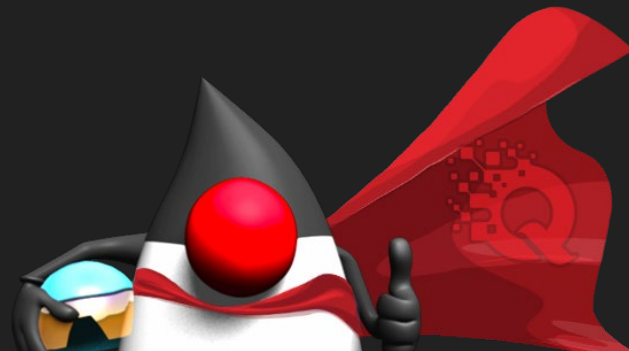


INFINISPAN



Kubernetes Native

Demo



Memory (RSS) in Megabytes



Quarkus with GraalVM

Quarkus with OpenJDK

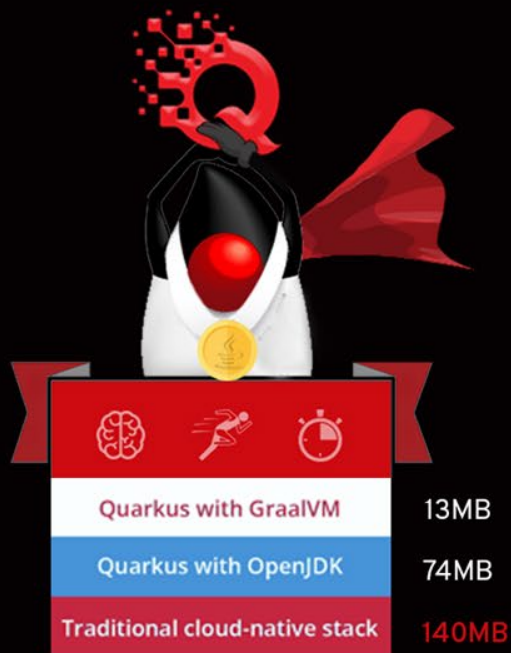
Traditional cloud-native stack

Boot + First Response Time in Seconds



MEMORY & BOOT + FIRST RESPONSE TIME

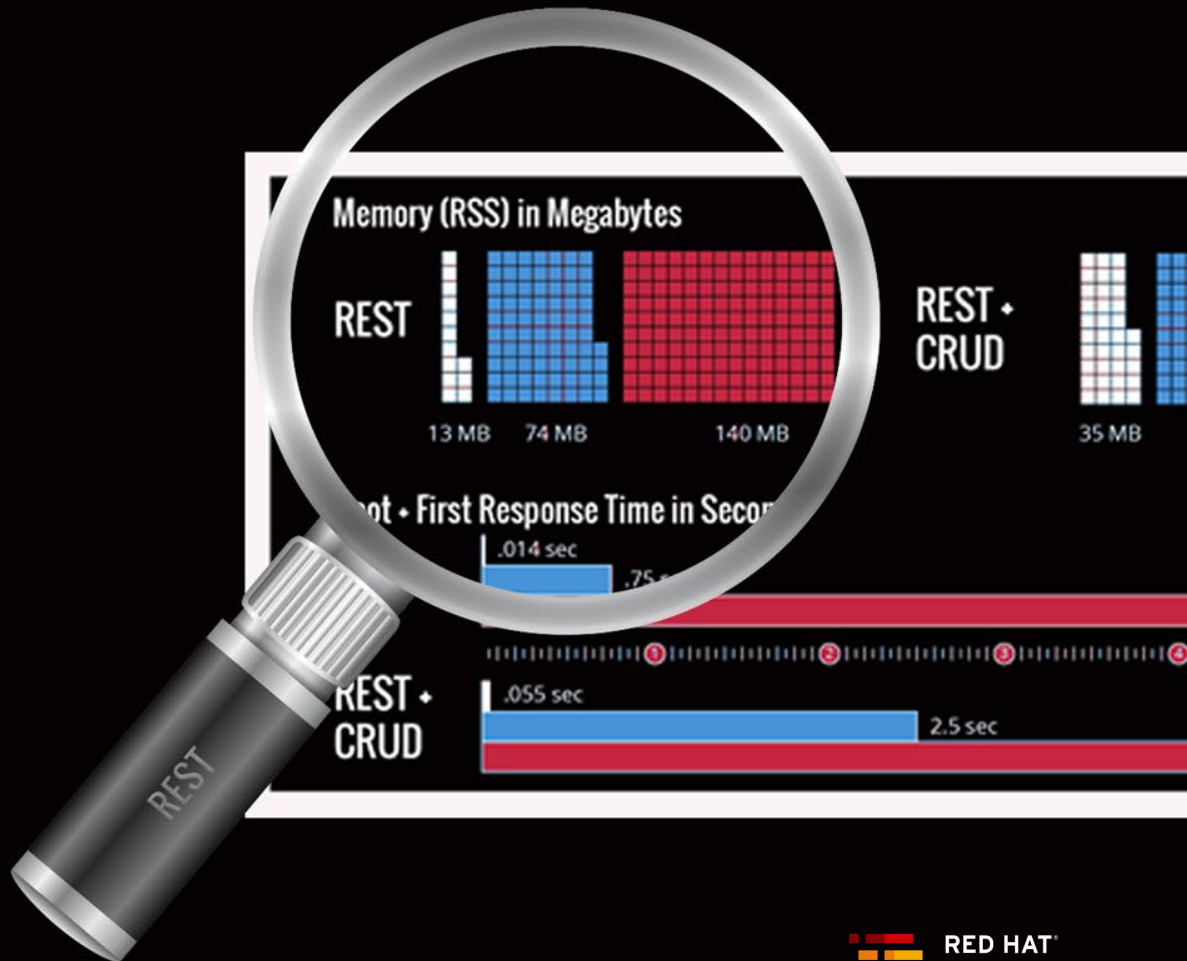


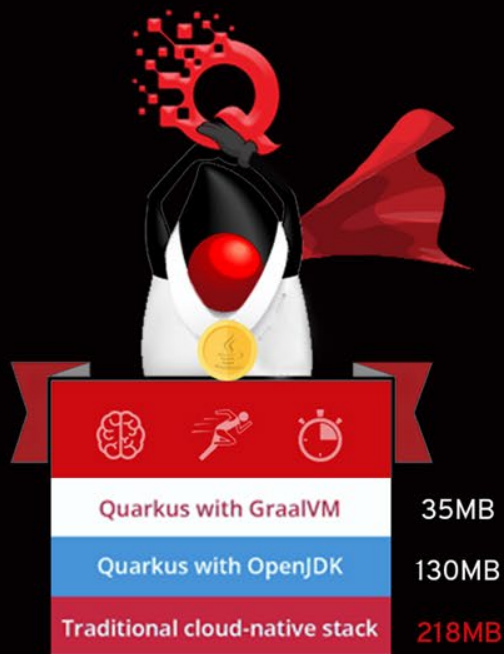


Memory (RSS) in Megabytes



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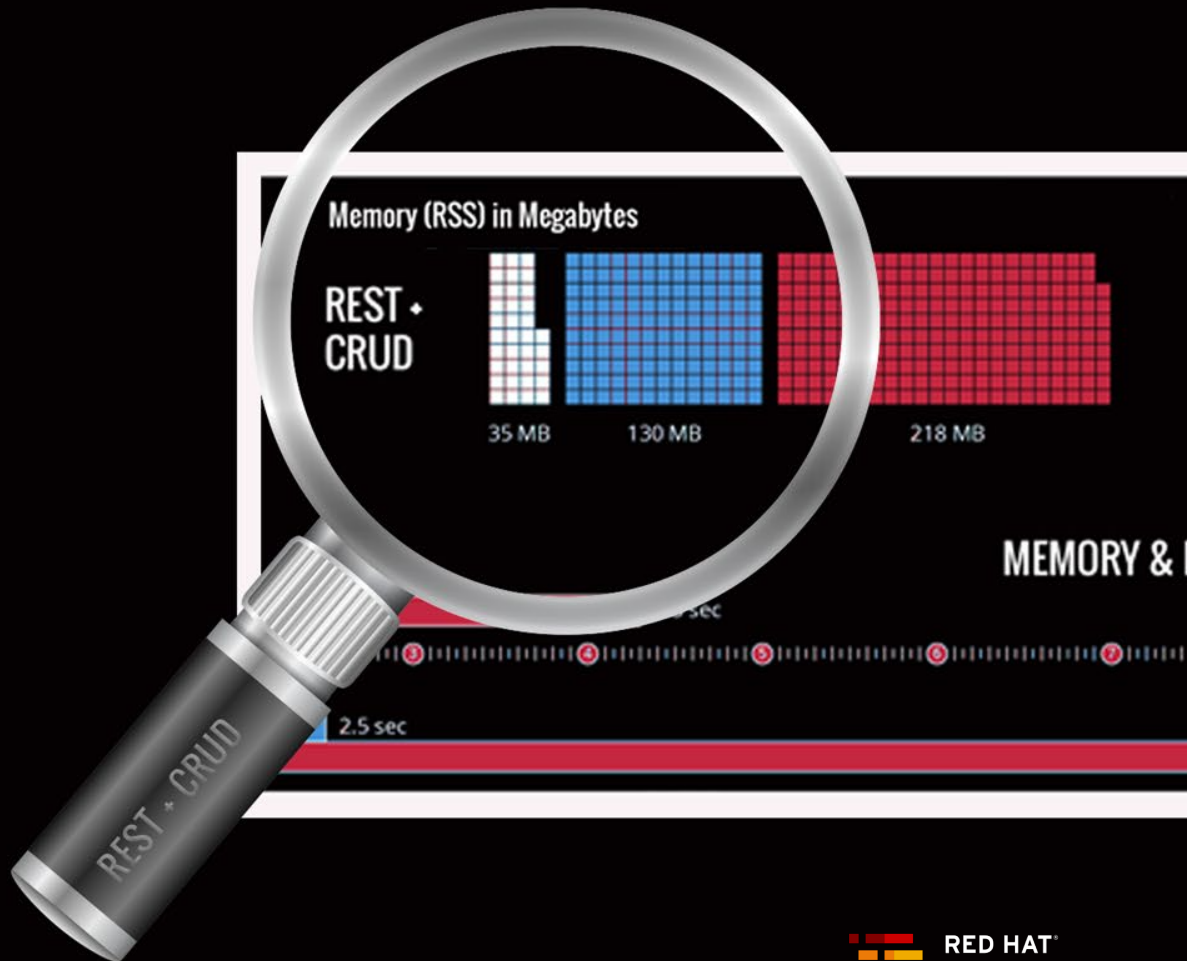




Memory (RSS) in Megabytes



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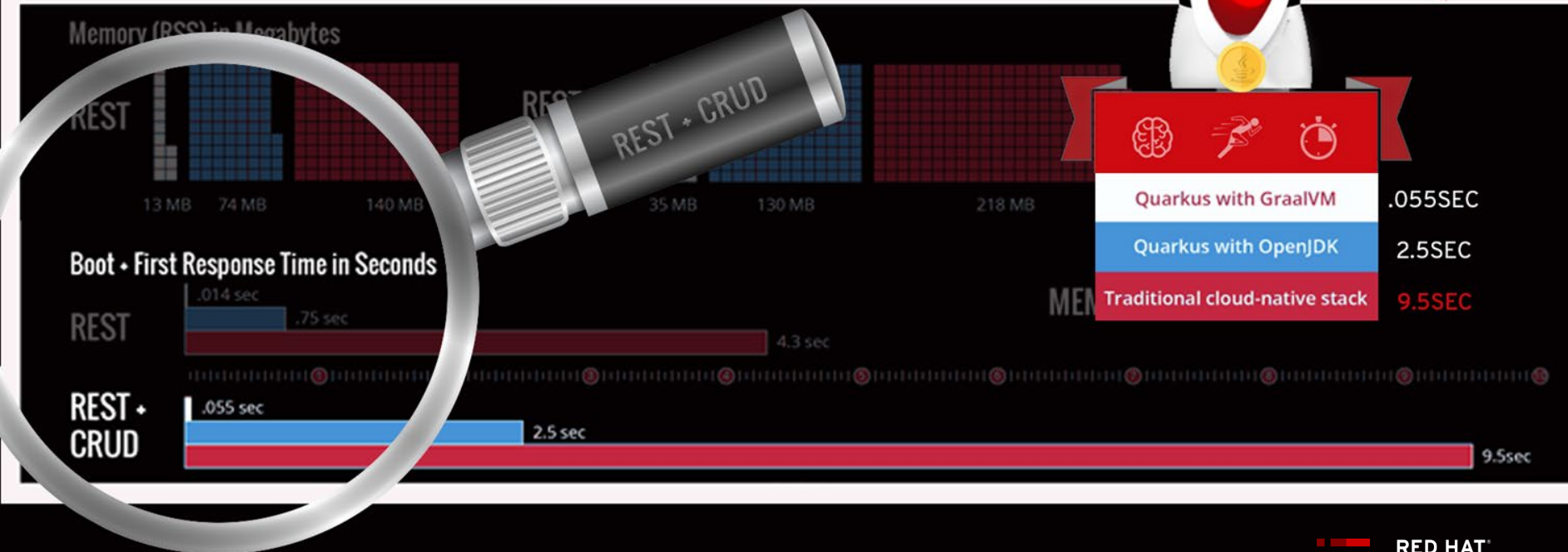
Boot + First Response Time in Seconds



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Boot + First Response Time in Seconds





10x smaller.

Up to 100x faster.

@burrsutter bit.ly/keynotequarkus



RED HAT
DEVELOPER

It's just the
beginning ...



~~The End~~