Couchbase

Simple. Fast. Elastic.

Couchbase Server 2.0

Frank Weigel, Couchbase Inc

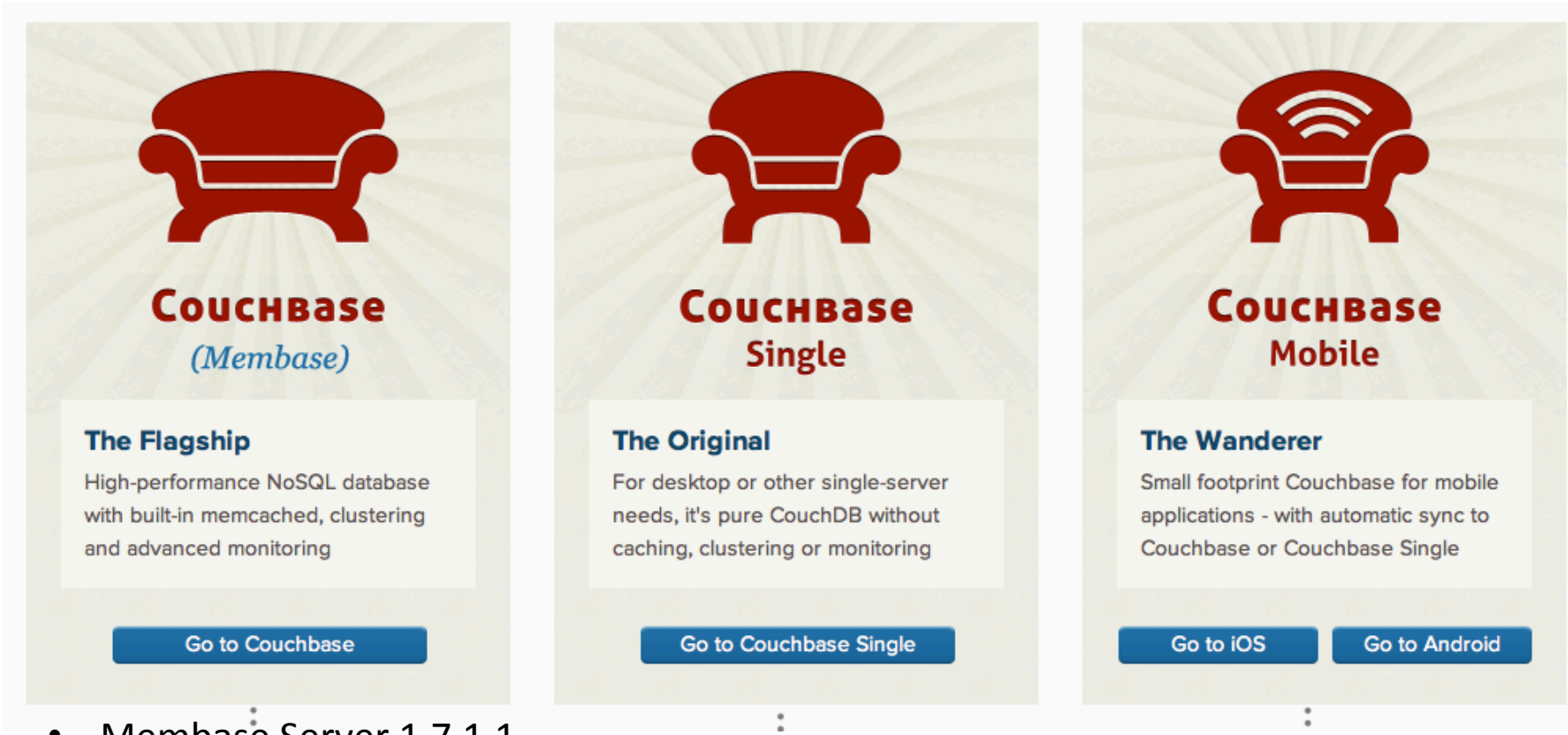
Data management for interactive web and mobile applications.

Company Background

Couchbase

- NoSQL database company
  - Result of merger between Membase and CouchOne
- Open source development & distribution model
- Provide easy-to-develop & -deploy, high performance, easily scalable, document database
- Focused on internet & mobile applications and cloud computing environments
- Mature, reliable & widely deployed solution
  - 1000s of paid production deployments worldwide
- Located in Silicon Valley (Mountain View, CA)

Couchbase.org Lineup



- Membase Server 1.7.1.1
  - 1.7.2 next week
- Couchbase Server 2.0 DP3 end October
- Couchbase Single Server 1.2 just released
  - Single Server 2.0 GA Nov 7th
- Couchbase Mobile iOS GA Nov 7th
  - Mobile Android Beta Nov 7th

Couchbase Single Server (a.k.a CouchDB)

- **Couchbase Single Server 1.2**
  - Based on Apache CouchDB 1.1.x branch
  - Replication database
  - Details: http://docs.couchbase.org/couchbase-single-server-1.2/couchbase-single-preface.html#couchbase-single-newfeatures-1.2
- **Couchbase Single Server 2.0**
  - Based on Apache CouchDB 1.2 branch plus extras
  - Performance Improvements
    - IO compression for faster effective IO, reduced view generation time and reduced disk usage.
    - Asynchronous write optimizations.
  - Compaction Improvements
    - Automatic compaction
    - Detailed data size reporting to assess compaction benefits/trigger compaction
  - Experimental Coffeescript support

Couchbase Mobile

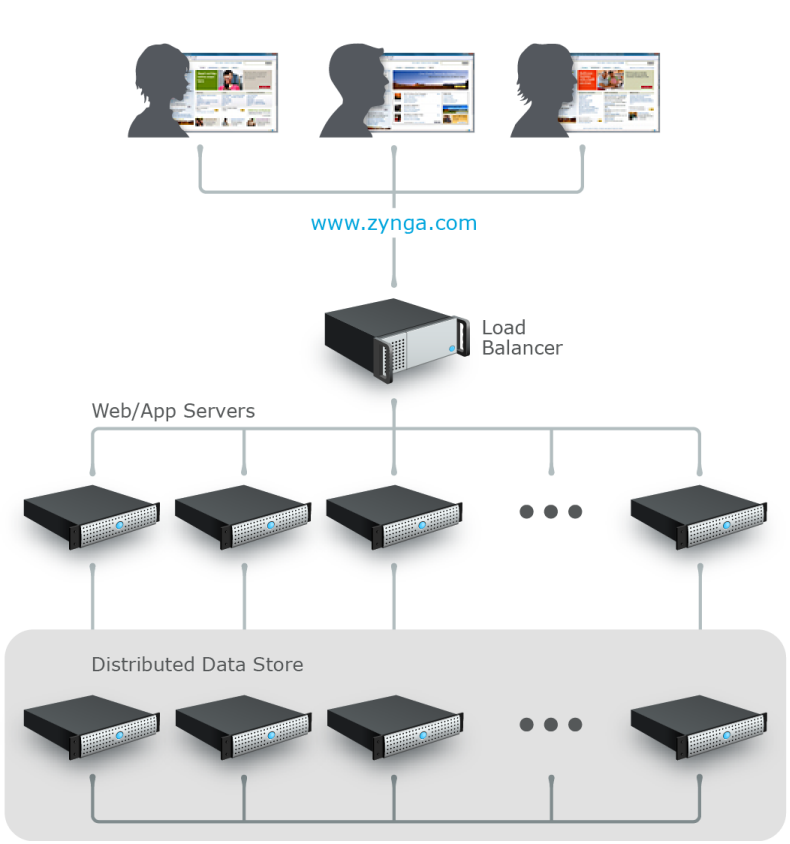
- Couchbase on Mobile devices
- Data available offline
- Real-time multi- device synchronization
  - Including to the Cloud
- iOS and Android support
  - SDKs provided (CouchCocoa, Ektorp)

Check it out today at :
http://www.couchbase.org/get/couchbase-mobile-for-ios/current

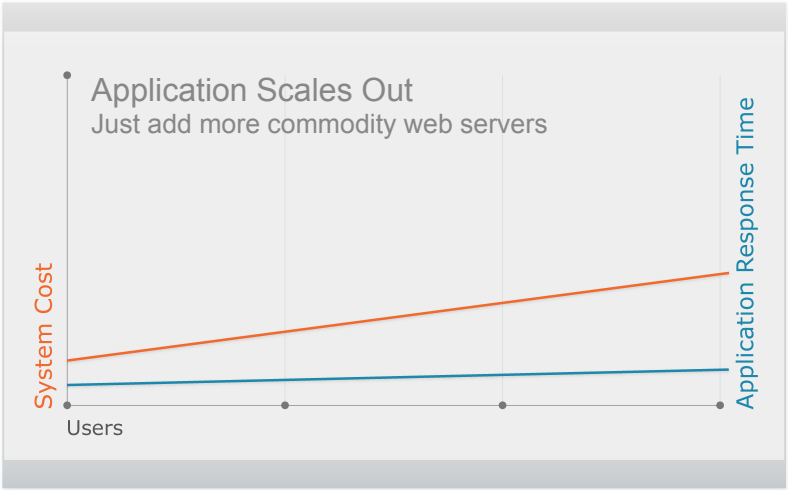
Things Have Changed

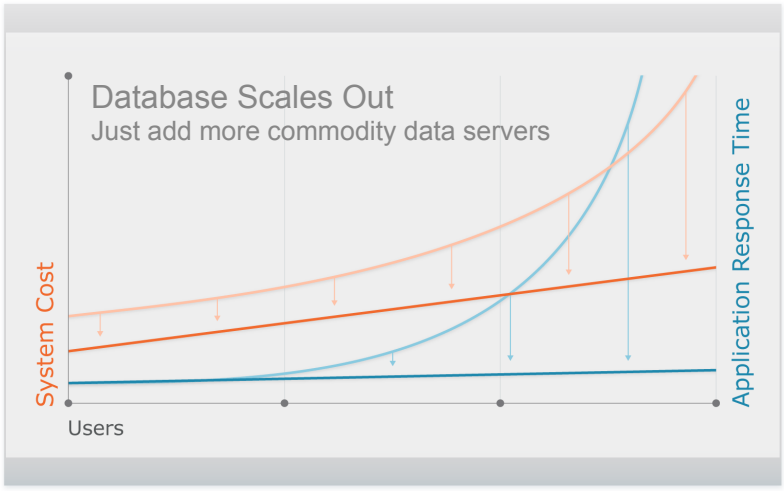
- Number of users of apps growing rapidly
  - Was thousands, now often millions or more
- Amount of data stored in apps growing rapidly
  - Was GBs, now often 1000s of GBs or more
- Types of data stored in apps is different
  - Was structured, now often unstructured & user-generated
  - Many apps including social features to increase engagement
- Data you want to store is changing rapidly
  - Fixed data model was okay, now its not flexible enough
- High-speed networking is inexpensive
  - Central computing was okay, now distributed computing better

Data Layer Matches Application Logic Tier Architecture



- Horizontally scalable with auto-sharding
- High performance at web scale
- Schema-less for flexibility

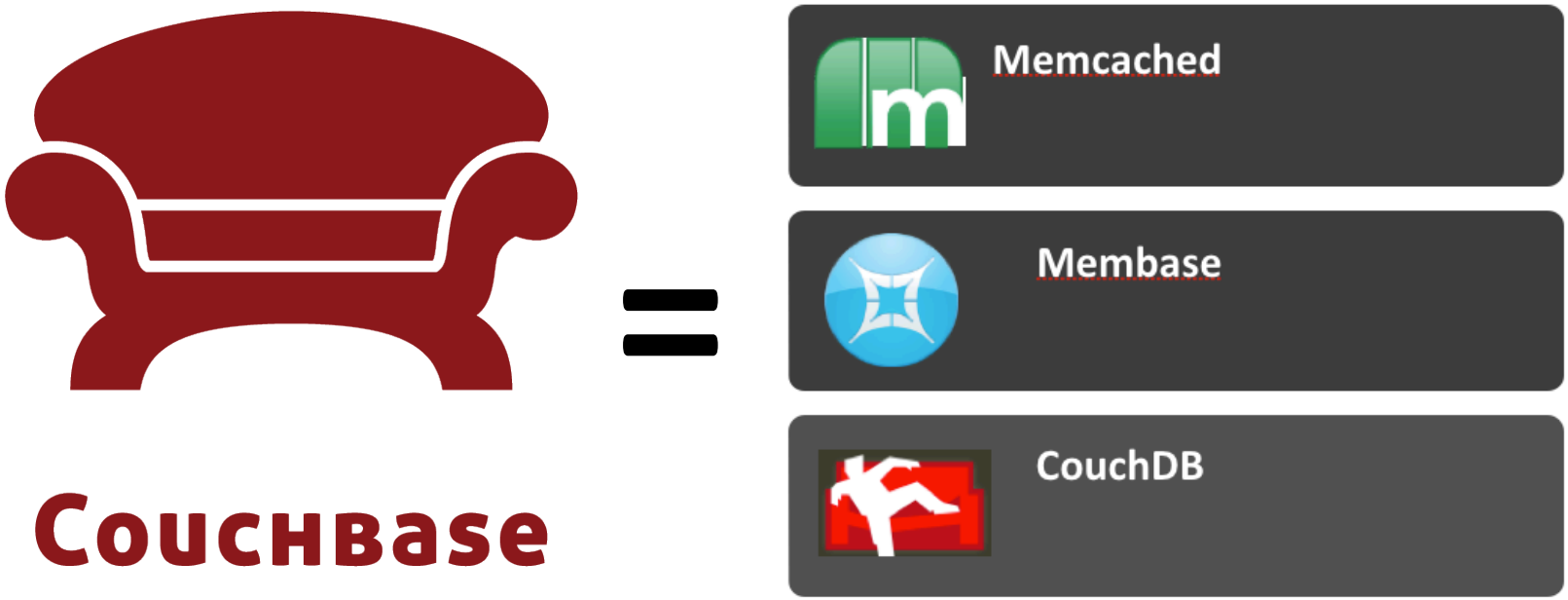




Scaling out flattens the cost *and* performance curves.

Paid Production Deployment Examples

Couchbase Server 2.0



Simple. Fast. Elastic

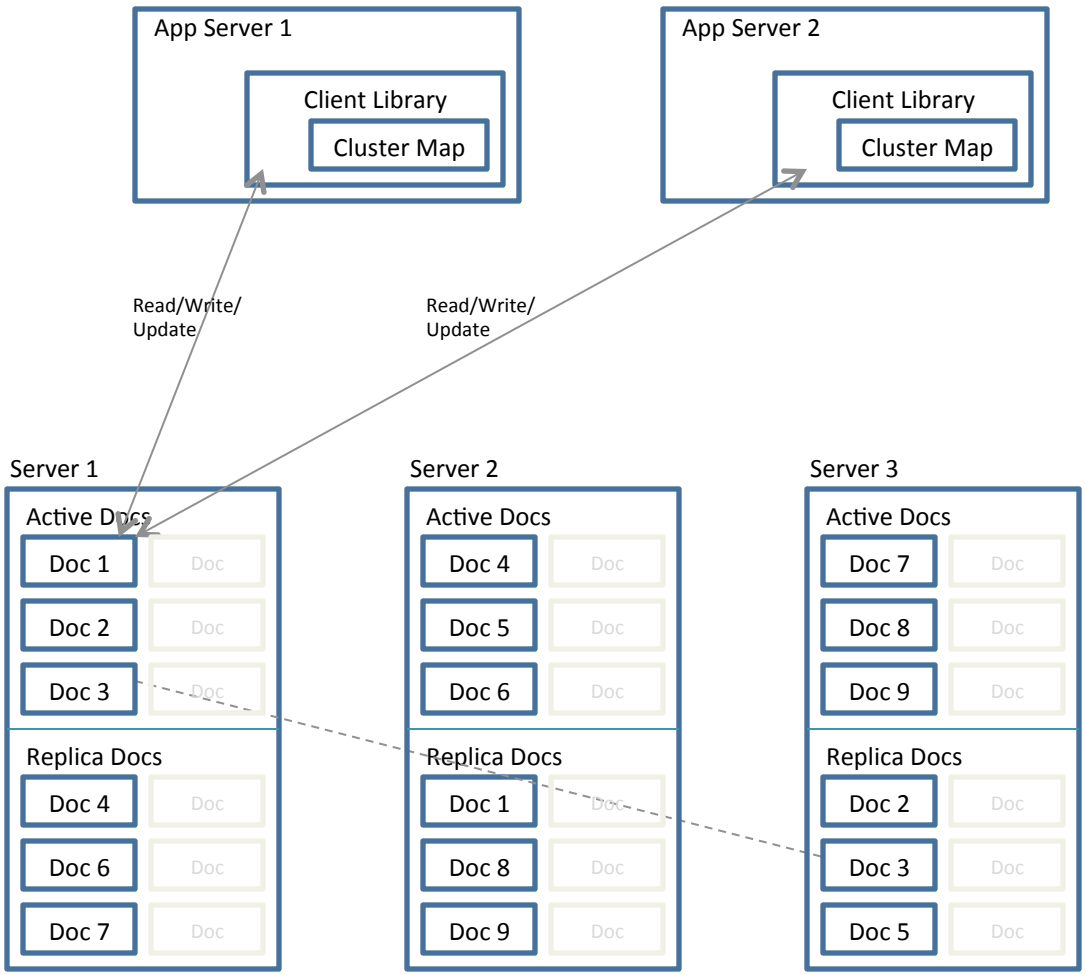
Couchbase Server 2.0: Fast, Simple, Elastic

- Fast
  - Sub ms data access
  - Enabled by the memcached caching layer
  - Proven append-only CouchDB storage assures data durability

- Simple
  - Easy download, development, deployment
  - Built-in monitoring and operational GUI
  - All nodes are identical
  - Schema-less document database
  - Indexing, querying , other features for easy development

- Elastic
  - Scalability from 1 to 10s to 100s of nodes
  - Architecture that allows small or massive scale
  - Monitoring & alerts that allows easy management at scale
  - Robustness that has been proven by large scale customers

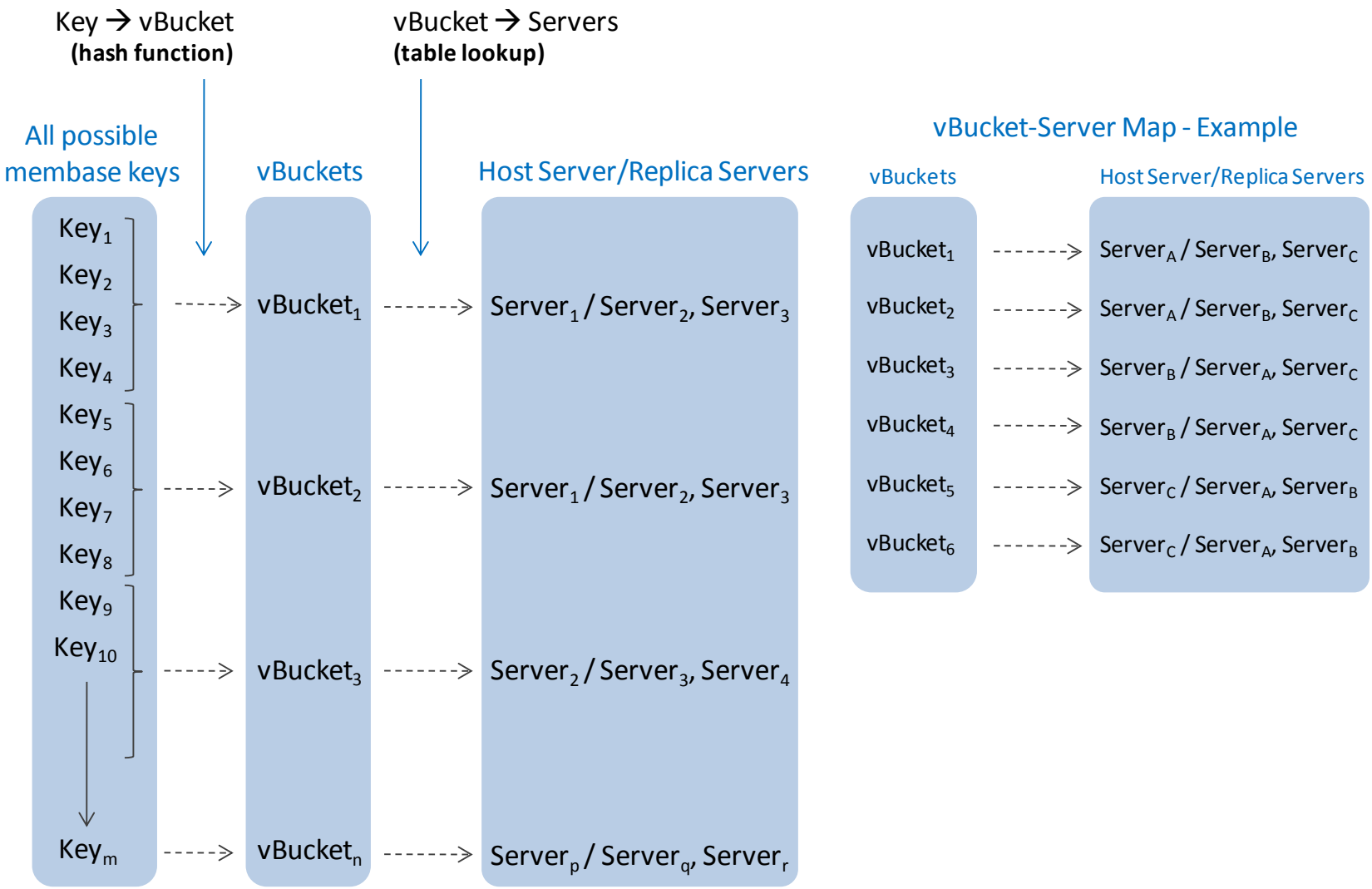
Basic Operation



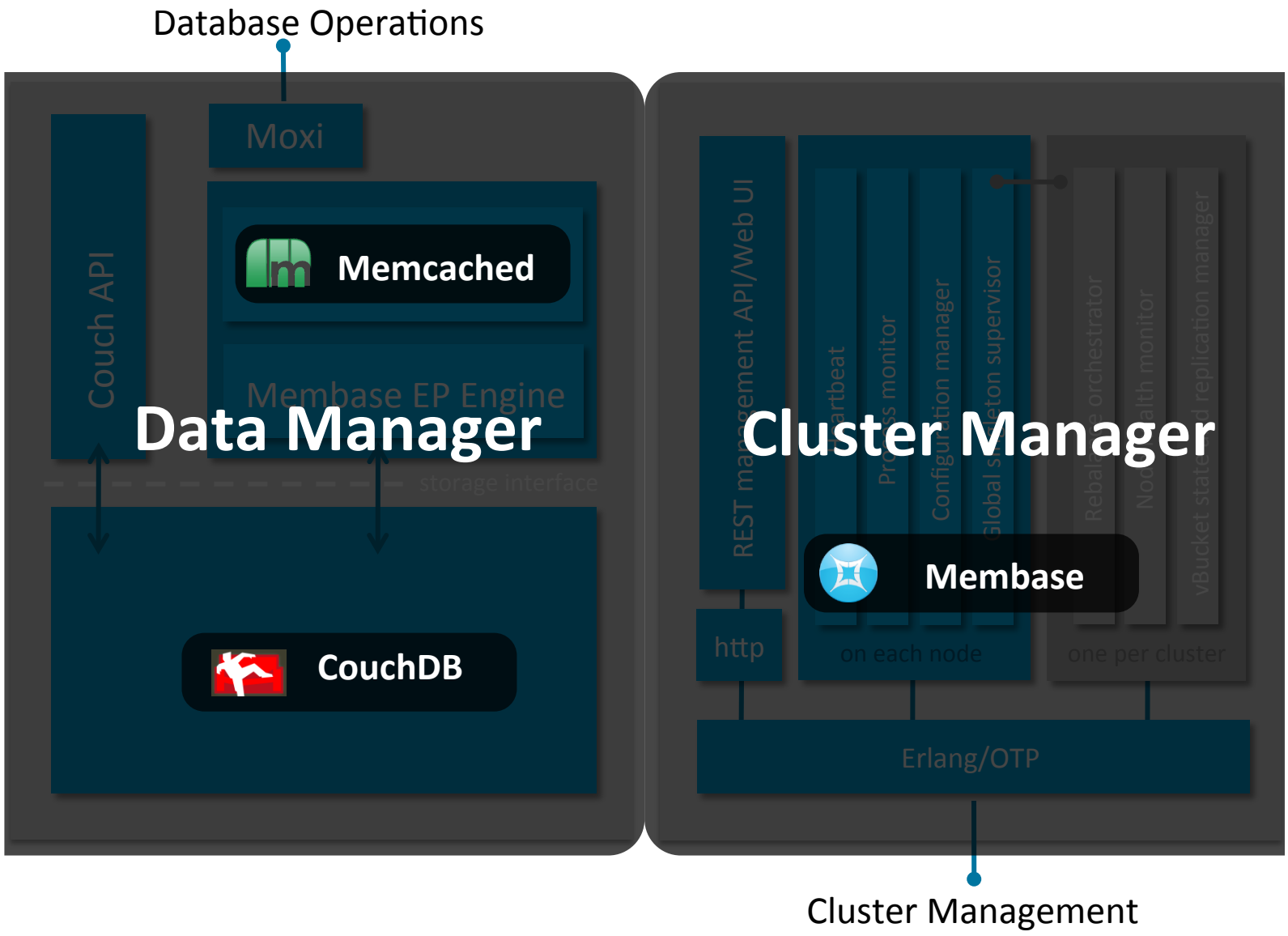
- Docs distributed evenly across servers in the cluster
  - No single point of failure
- Each server stores both *active* & *replica* docs
  - Only 1 server active at a time for a specific active doc, overall reads and writes are spread out across cluster
  - Replicas for any server spread out across cluster
- Client library provides app with simple interface to database
- Cluster map provides map to which server doc is on
  - App never needs to know
- App reads, writes, updates docs
- Multiple App Servers can access same document at same time

User Configured Replica Count = 1

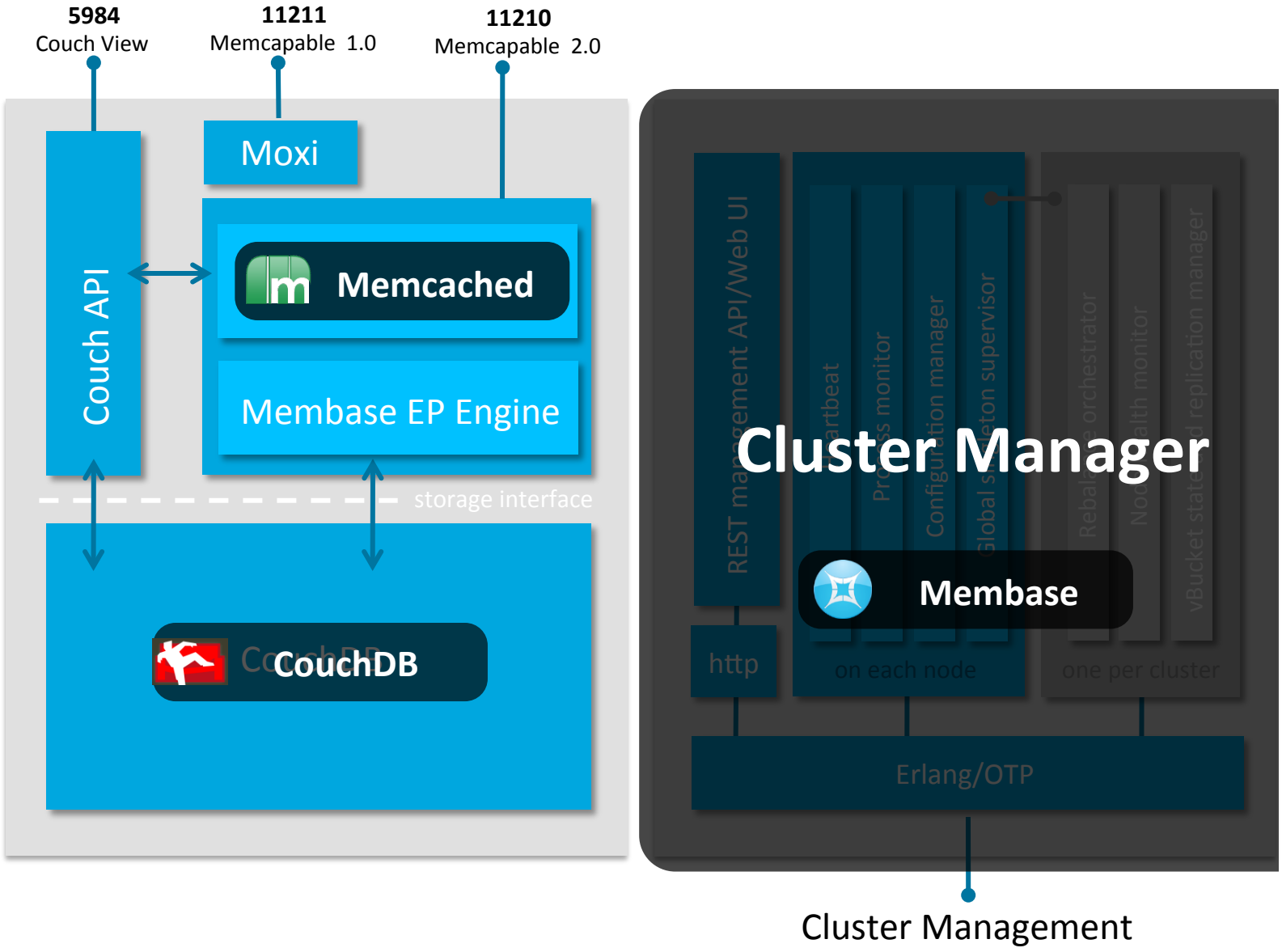
Data Sharding (partitioning actually)



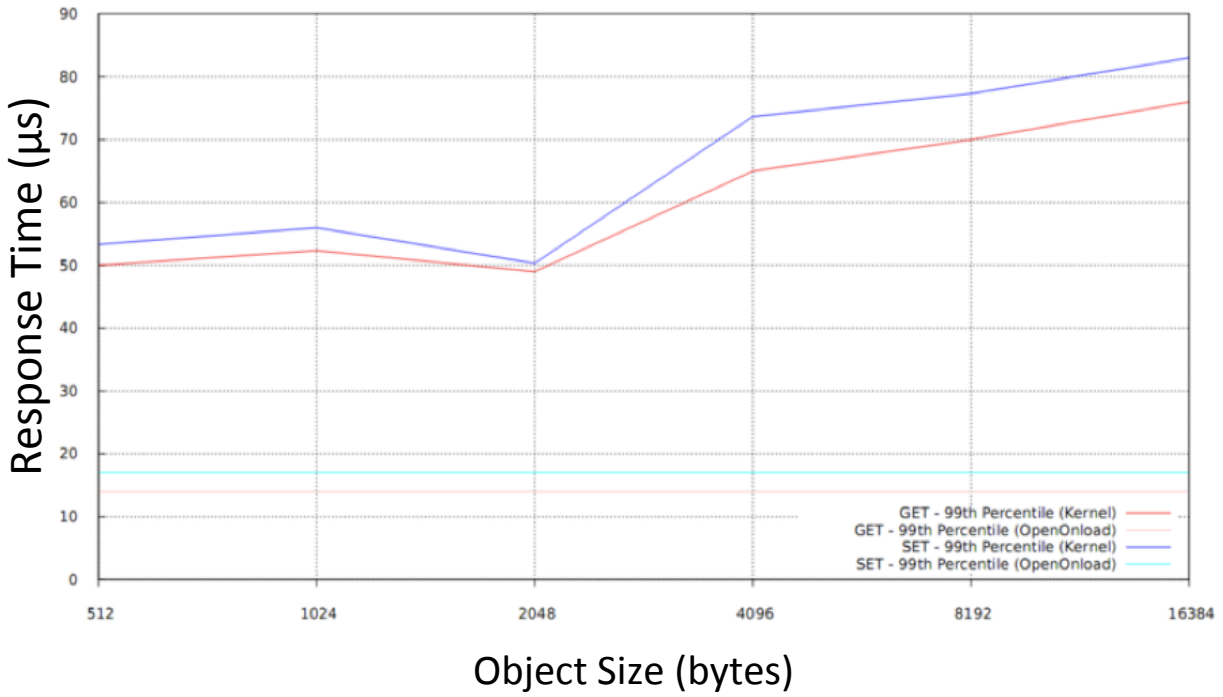
Couchbase Server 2.0 Architecture



Couchbase Server 2.0 Architecture



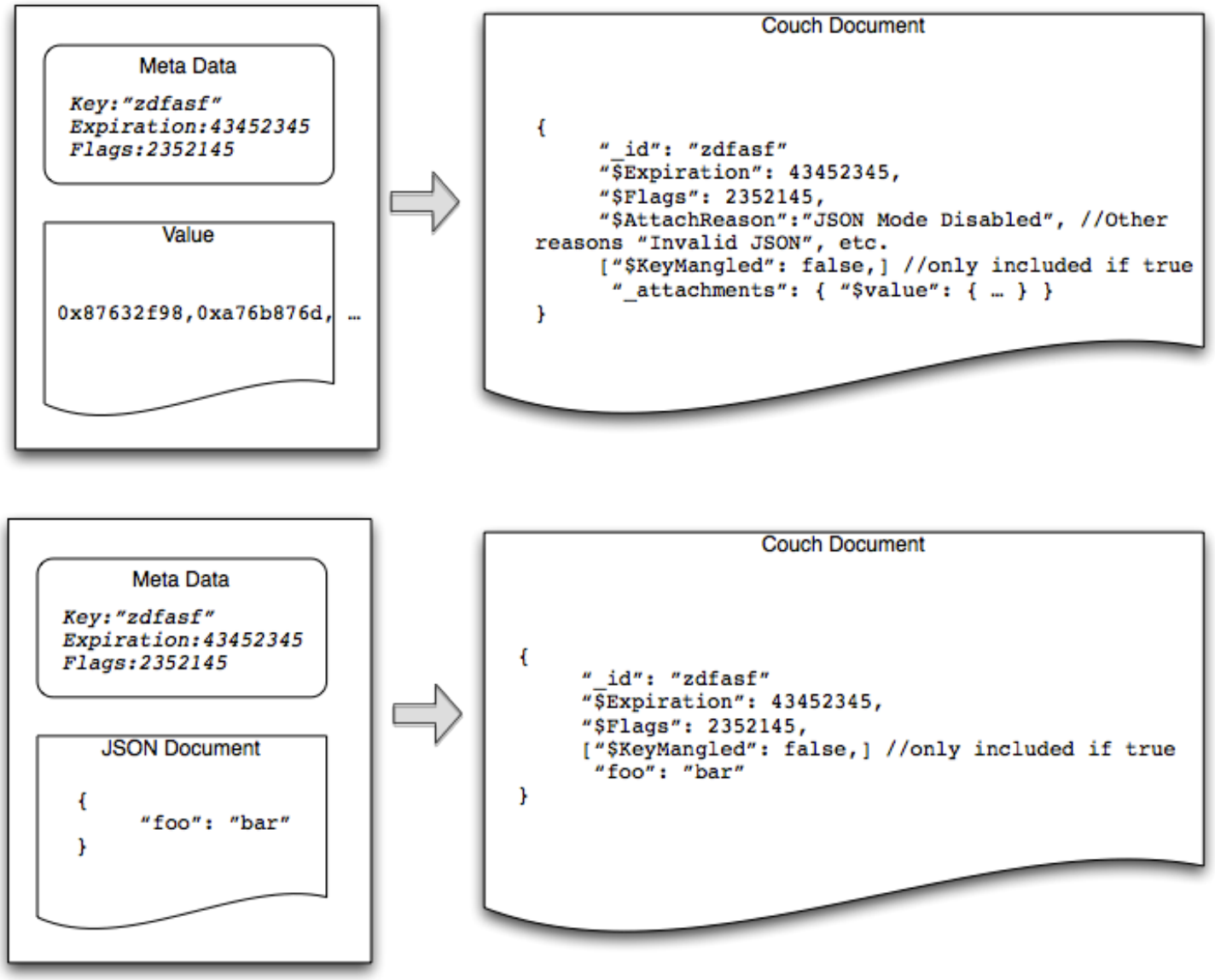
Low Latency Example Data



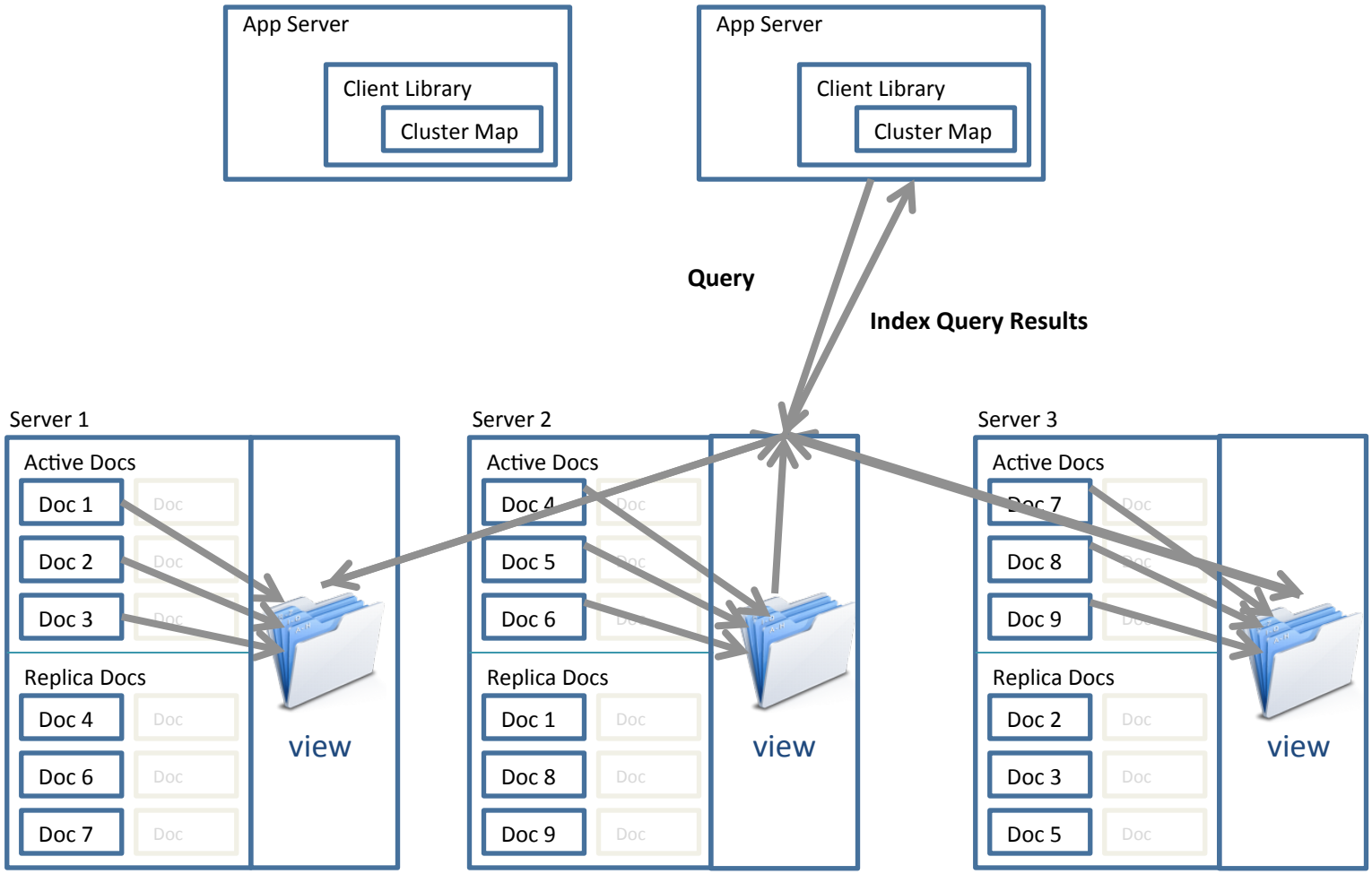
- Latency test example on 10GigE
  - http://10gigabitethernet.typepad.com/network_stack/2011/09/couchbase-goes-faster-with-openonload.html

- <90 us [!] latency with kernel networking
  - <20us latency with OpenOnload optimized networking stack (bypassing kernel)

JSON Document Encodings

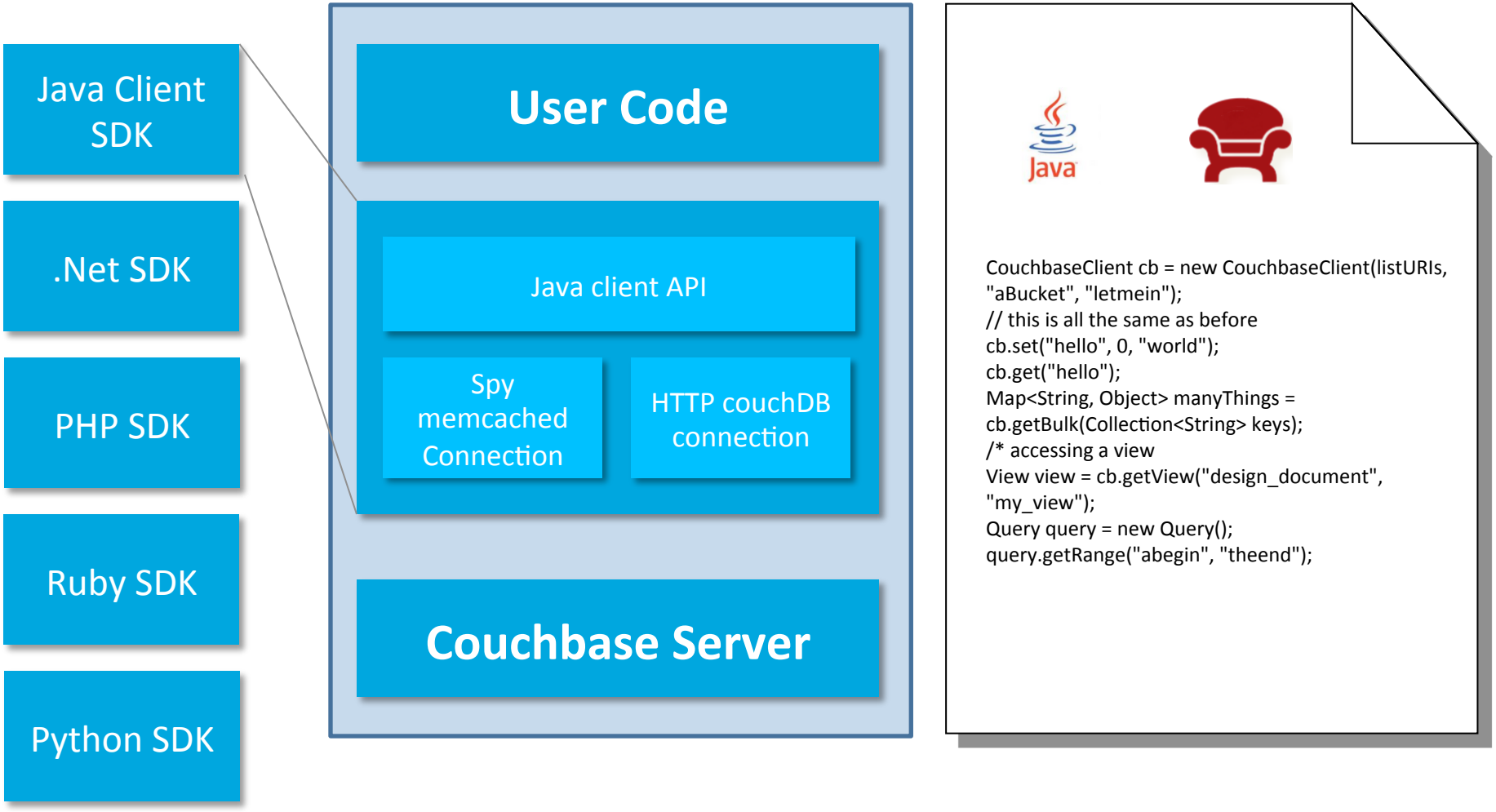


Indexing/Querying



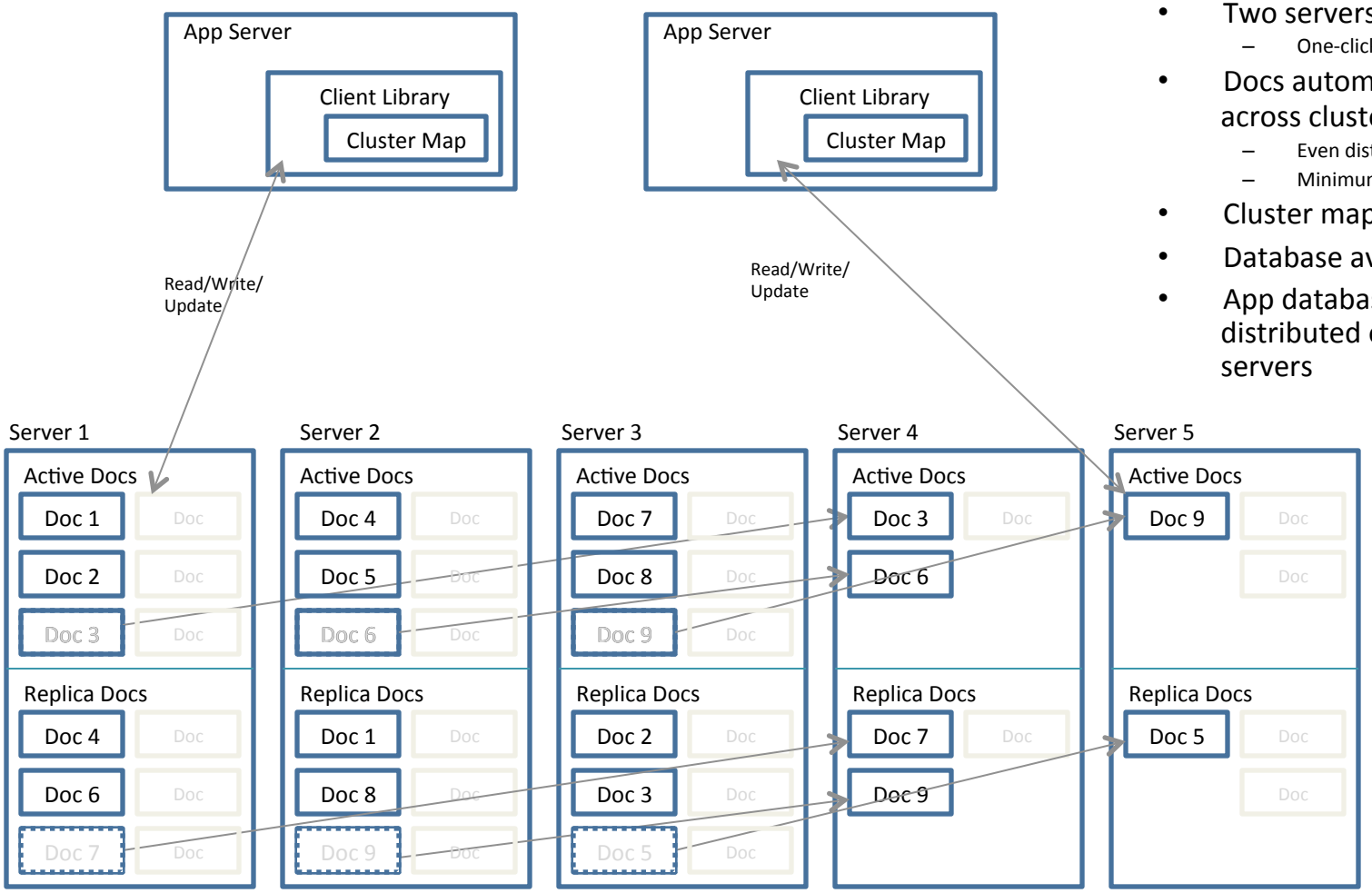
DEMO TIME

Couchbase Client SDKs



http://www.couchbase.org/code

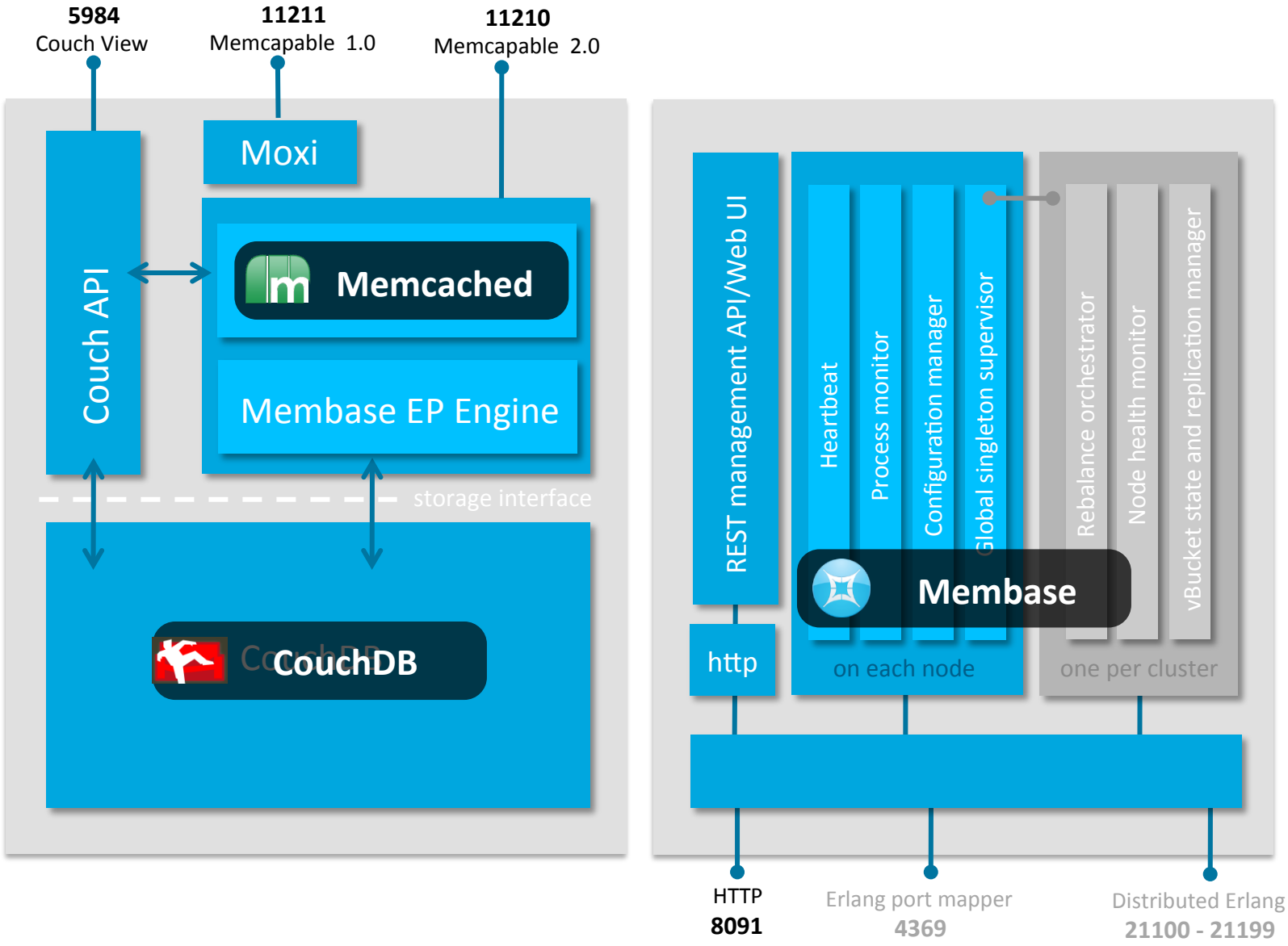
Adding Nodes



- Two servers added to cluster
  - One-click operation
- Docs automatically rebalanced across cluster
  - Even distribution of docs
  - Minimum doc movement
- Cluster map updated
- Database available throughout
- App database calls now distributed over larger # of servers

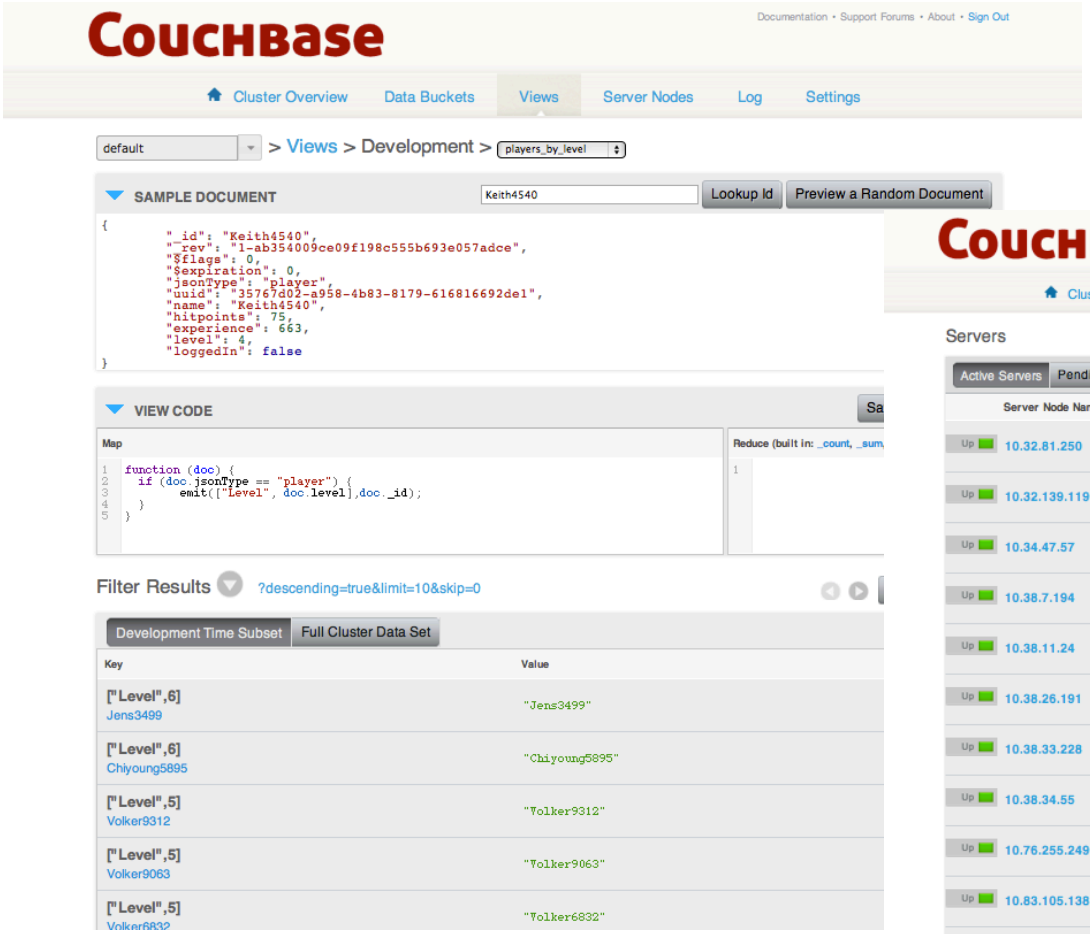
User Configured Replica Count = 1

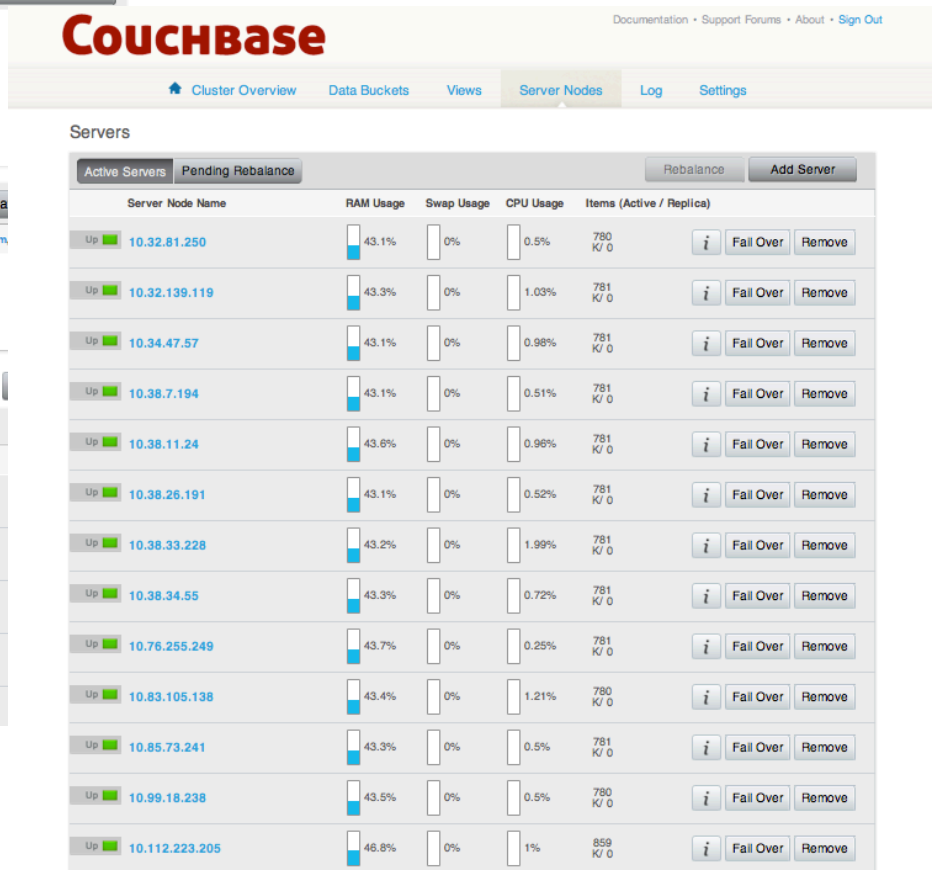
Couchbase Server 2.0 Architecture



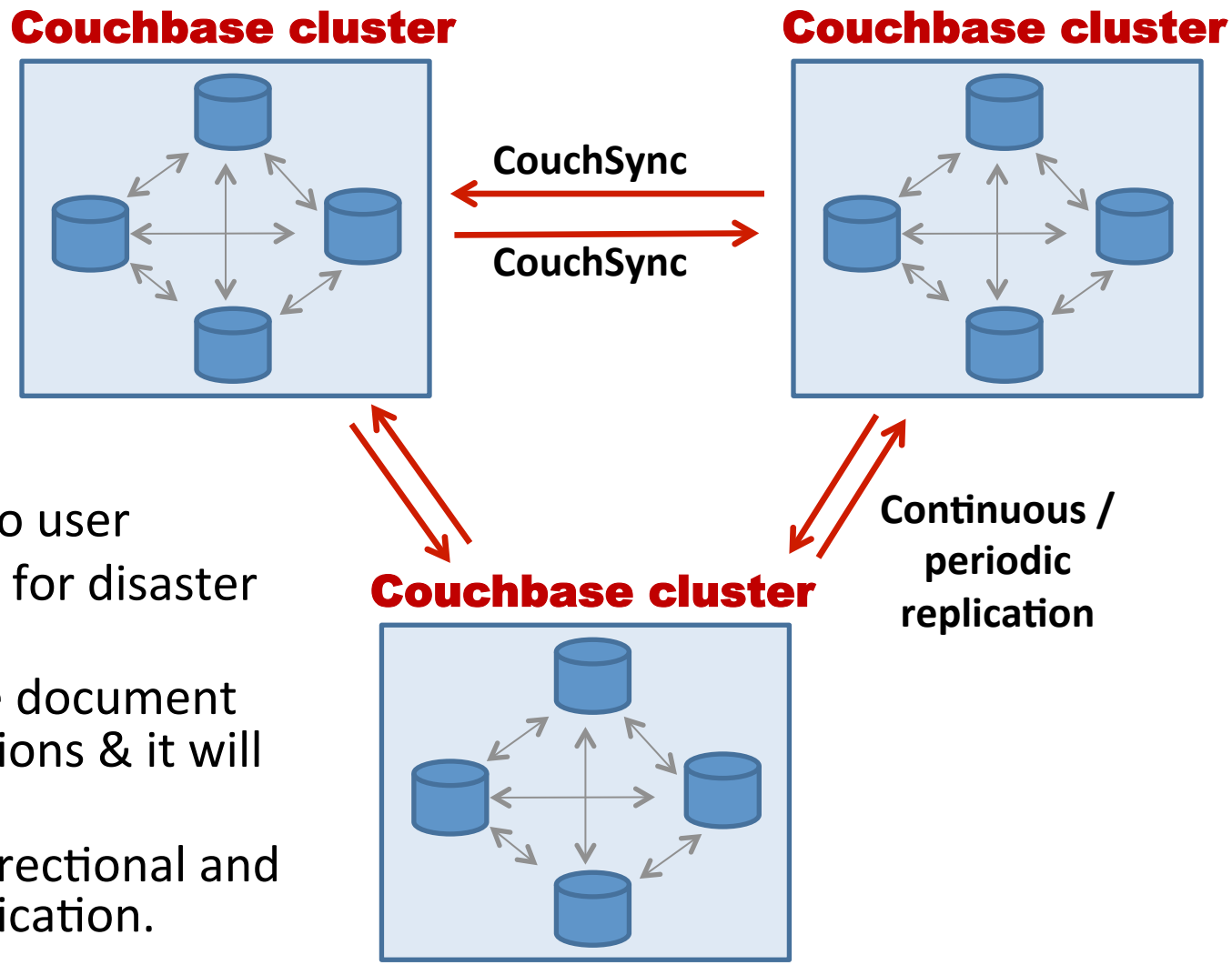
DEMO TIME

Simple Monitoring and Operations





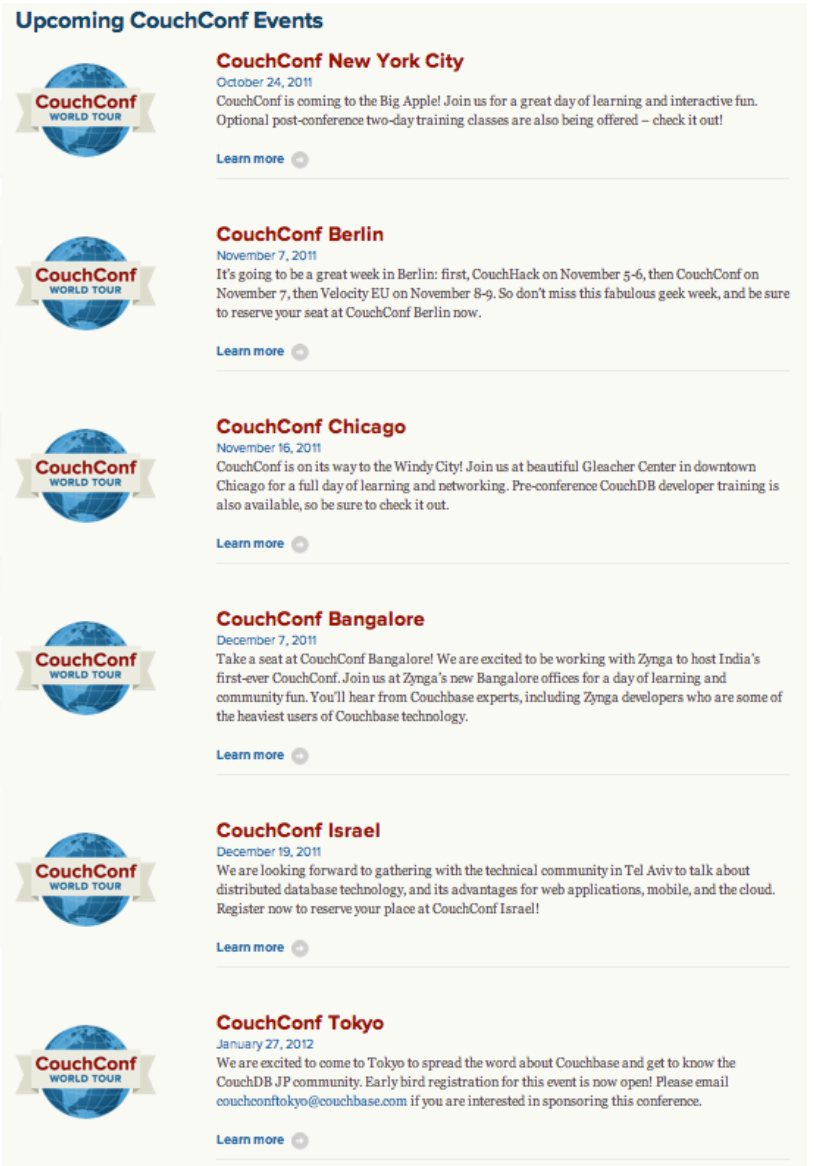
Cross Cluster Replication



- Move data close to user
- Multiple locations for disaster recovery
- Can write to same document in all different regions & it will sync
- Support for uni-directional and bi-directional replication.

CouchConf World Tour

http://www.couchbase.com/couchconf-world-tour



Upcoming CouchConf Events

CouchConf New York City
October 24, 2011
CouchConf is coming to the Big Apple! Join us for a great day of learning and interactive fun. Optional post-conference two-day training classes are also being offered – check it out!
Learn more

CouchConf Berlin
November 7, 2011
It's going to be a great week in Berlin: first, CouchHack on November 5-6, then CouchConf on November 7, then Velocity EU on November 8-9. So don't miss this fabulous geek week, and be sure to reserve your seat at CouchConf Berlin now.
Learn more

CouchConf Chicago
November 16, 2011
CouchConf is on its way to the Windy City! Join us at beautiful Gleacher Center in downtown Chicago for a full day of learning and networking. Pre-conference CouchDB developer training is also available, so be sure to check it out.
Learn more

CouchConf Bangalore
December 7, 2011
Take a seat at CouchConf Bangalore! We are excited to be working with Zynga to host India's first-ever CouchConf. Join us at Zynga's new Bangalore offices for a day of learning and community fun. You'll hear from Couchbase experts, including Zynga developers who are some of the heaviest users of Couchbase technology.
Learn more

CouchConf Israel
December 19, 2011
We are looking forward to gathering with the technical community in Tel Aviv to talk about distributed database technology, and its advantages for web applications, mobile, and the cloud. Register now to reserve your place at CouchConf Israel!
Learn more

CouchConf Tokyo
January 27, 2012
We are excited to come to Tokyo to spread the word about Couchbase and get to know the CouchDB JP community. Early bird registration for this event is now open! Please email coucheonftokyo@couchbase.com if you are interested in sponsoring this conference.
Learn more

Q&A

GET COUCHBASE SERVER:

HTTP://WWW.COUCHBASE.ORG/GET/COUCHBASE/2.0.0

RDBMS HAS DOMINATED FOR 40 YEARS BUT NO LONGER BEST SOLUTION FOR MANY APPS

> “Relational database technology has served us well for 40 years, and will likely continue to do so for the foreseeable future to support transactions requiring ACID guarantees. But a large, and increasingly dominant, class of software systems and data do not need those guarantees. Much of the data manipulated by Web applications have less strict transactional requirements but, for lack of a practical alternative, many IT teams continue to use relational technology, needlessly tolerating its cost and scalability limitations. For these applications and data, distributed document cache and database technologies such as Couchbase’s provide a promising alternative.”

Carl Olofson
IDC Research Vice President, Information and Data Management