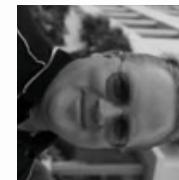


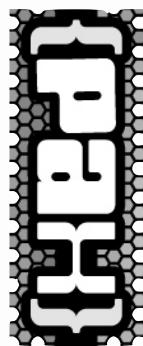
First Things First

Thanks!



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Hands-on Cloud Storage

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multi - cloud library

What's in Store (tee hee)

- BlobStore intro
- Setting up
- Let's get coding!
- Review
- Real-world showcase
- From here...



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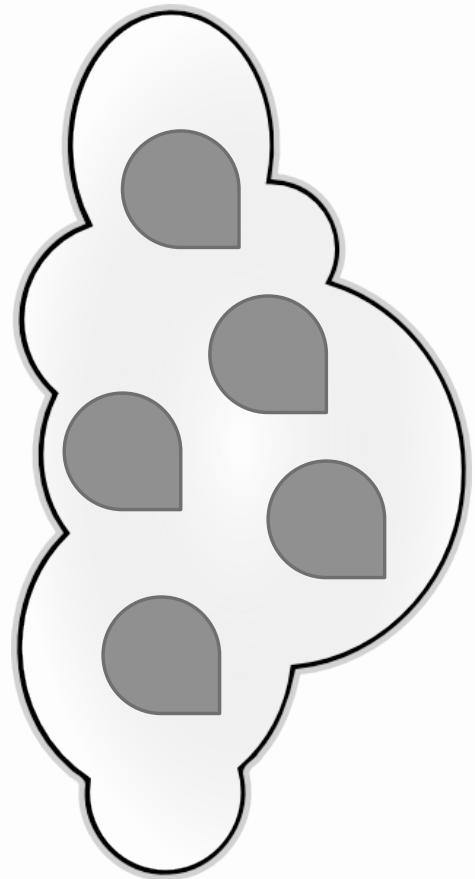
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Ego slide

Adrian Cole (@jclouds)
founded jclouds march 2009
chief evangelist at cludsoft

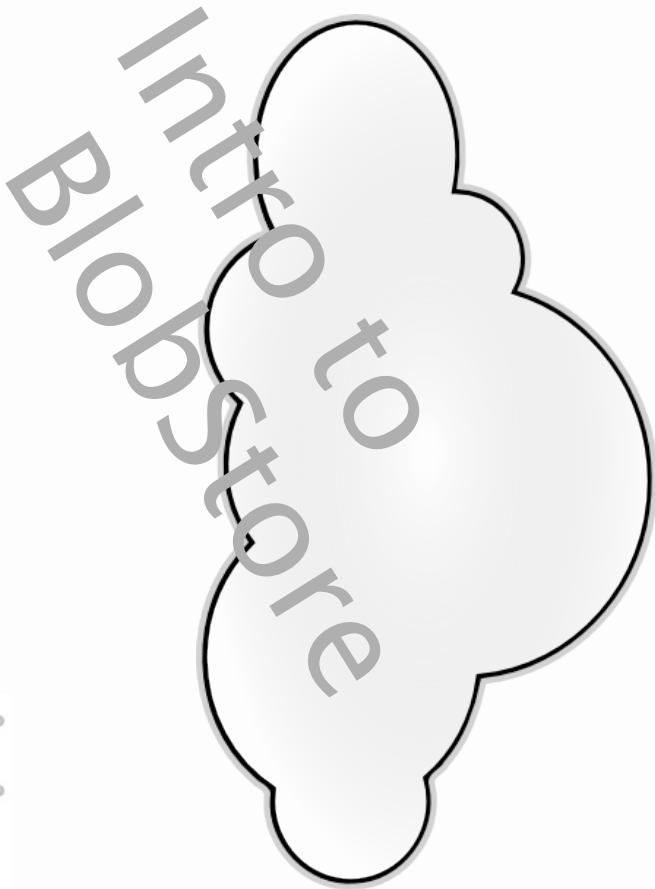
Bringing Business to the Cloud

Geddit? :-)



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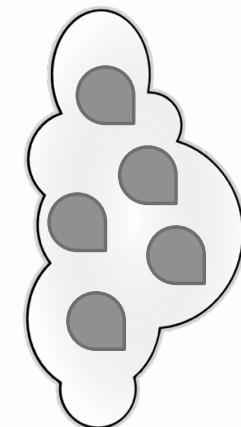
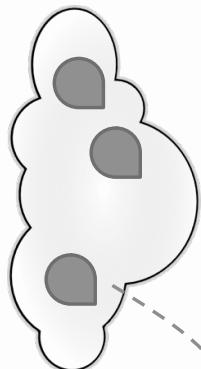
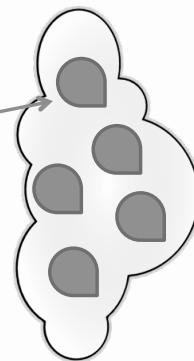
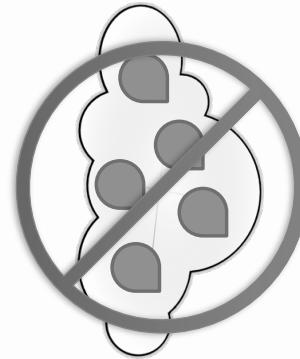
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Why?

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An OSSM Persistence Store

- On-demand
- Self-service
- Scalable
- Measurable

™ Dave Nielsen, CloudCamp

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In Good Company

Infinispan



FAMILY
SEARCH

Karaf



omnifor
webservices

pallet



SeatYourself

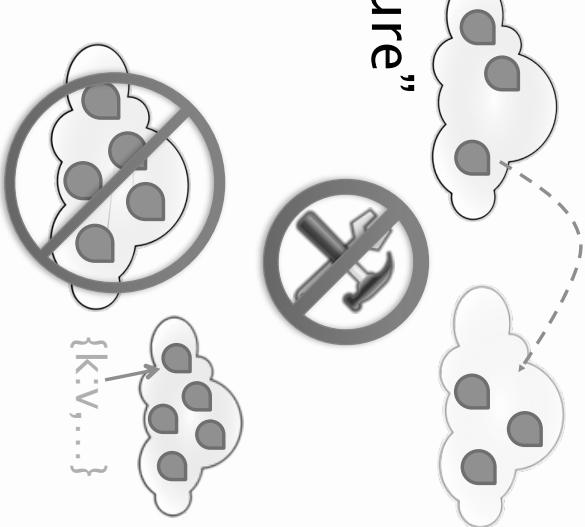
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Why?

- Low/No maintenance
- Portability
- No “accidental structure”
- Simple interface
- Choice
- ...

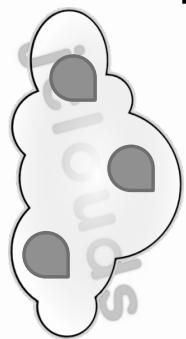


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Why jcclouds?



- OSGi compatible
- Clojure binding
- “Invented” many standard SDK features
 - e.g. sync/async APIs
- Tested!
 - “official” TCK for a number of cloud providers

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Why jcclouds?

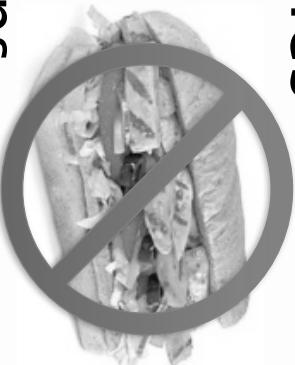
- Data Portability
 - APIs are not as compatible as they might appear
- Code Portability
 - Currently 33 cloud providers
- Enterprise-grade
 - Move petabytes of data
- Parallel operations without threading concerns
 - Outperforms many native SDKs
 - GAE compatible

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No Free Lunches



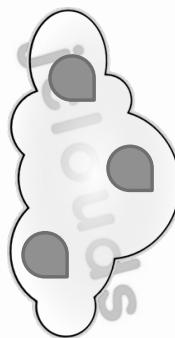
- Watch for conflicting deps
 - Especially if living at the bleeding edge of fast-changing libs

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Why jclouds?



- Location metadata
 - Don't get locked in to a provider's deployment policy
- Does the hard work so you don't have to
 - Multi-part in native SDKs vs. .multipart () in jclouds
- Strong & active community

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Show Me The MoneyCode

```
(use 'org.jclouds.blobstore2)
(def *blobstore* (blobstore "azureblob" account key))
(create-container *blobstore* "movies")
(put-blob *blobstore* "movies" (blob "tron.mp4" :payload
tron-file))
```

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Show Me The MoneyCode

```
// init
context = new BlobStoreContextFactory()
    .createContext("s3", accesskeyid, secret);
blobstore = context.getBlobStore();
// create container
blobstore.createContainerInLocation(null,
"adriansmovies");
// add blob
blob = blobStore.blobBuilder("sushi.avi").payload(file)
    .build();
blobStore.putBlob("adriansmovies", blob);
```

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What's The Big Deal Then?

```
POST /<api version>/containers/id_of_adriansmovies/contents HTTP/1.1 Content-Length: 734859264Date: Wed, 01 Mar 2006 12:00:00 GMT
x-emc-uid: <uid> x-emc-signature: signature x-emc-meta:
Chef=Kawasaki
```



```
POST /<api version>/containers/id_of_adriansmovies/contents HTTP/
1.1 Content-Length: 734859382
Content-Type=multipart/form-data; boundary=--jclouds--
Authorization=Basic Gpjbg9=
---jclouds---
Content-Disposition: form-data; name="sushi.avi";
filename="sushi.avi"
Content-Type: application/octetstring
...
PUT /<api version>/files/from_above/metadata/Chef HTTP/1.1
Content-Length: 8
Content-Type: text/plain
Authorization: Basic Gpjbg9=
Kawasaki
```

SOFTLAYER™



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What's The Big Deal Then?

```
PUT /sushi.avi HTTP/1.1 Host:
adriansmovies.s3.amazonaws.comContent-Length: 734859264Date:
Wed, 01 Mar 2006 12:00:00 GMTAuthorization: signature x-amz-
meta-Chef: Kawasaki
```



Amazon S3
Simple Storage Service

```
PUT /adriansmovies/sushi.avi HTTP/1.1 Host:
<account>.blob.core.windows.netContent-Length: 734859264Date:
Wed, 01 Mar 2006 12:00:00 GMTAuthorization:
SharedKey <app>;signature
x-ms-meta-Chef: Kawasaki
```



```
PUT /<api version>/<account>/adriansmovies/sushi.avi HTTP/1.1
Host: storage.clouddrive.com Transfer-Encoding: chunkedX-Auth-
Token: session-token X-Object-Meta-Chef: Kawasaki
```



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In The Real World

- MVC pattern
 - Especially for non-JVM client-side code
- Storage adapter
 - e.g. HDFS
- More later!



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In The Real World

- Distribution point
 - Splitter
 - Side-loading
- “Sysadmin bridge”
 - PipeHttpResponseToTarxzpzflntoDirectory
 - PipeHttpResponseToBash
- Security filter
 - Allow requests without exposing



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Let's Get Ready...

- Get a flash drive
- Copy skeleton project
- Run `mvn package` in `exercise1` to check dependencies
- Import `exercise1` into a Maven-supporting IDE
- Phew!



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Setting Up

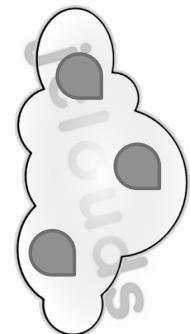
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Anatomy of a BlobStore

- 1 . Create context
- 2 . Get Blobstore API
- 3 . Do stuff
- 4 . Close context



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Let's Get
Coding!

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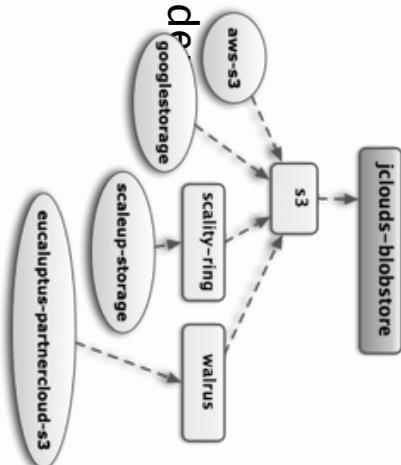
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A Theoretical Aside

jclouds modularity

- **APIs** org.jclouds.api
 - Describe services
 - “Abstract” and more specific
- **Providers** org.jclouds.provider
 - Implement APIs
 - Have location and defaults
- **Drivers** org.jclouds.driver
 - Add features to a jclouds context
 - E.g. log4j, Google App Engine support etc.



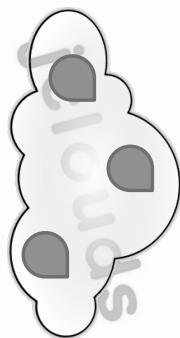
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Creating a jclouds Context

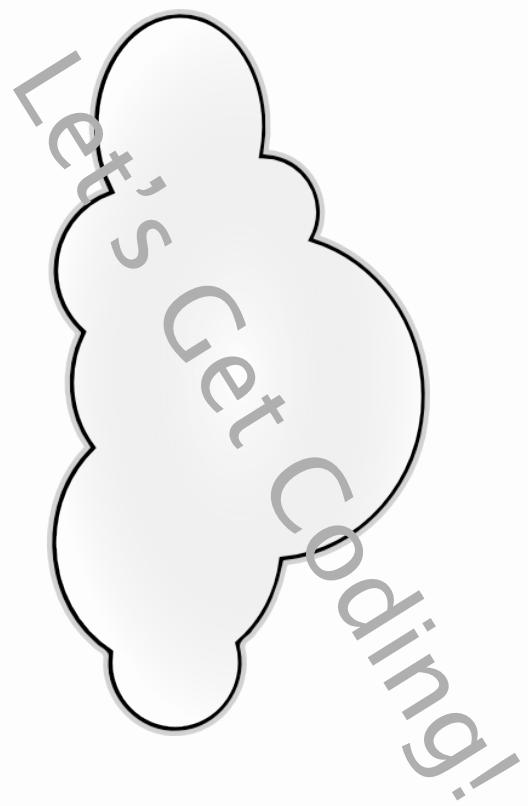
- Provider
- Credentials
- Modules
 - Additional options



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Let's Get Coding!

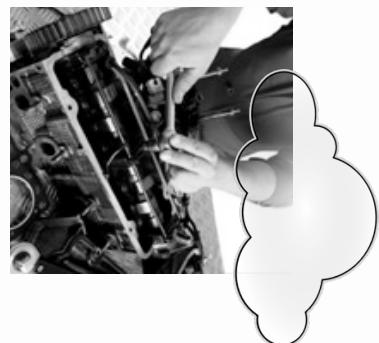
Exercise 1

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Tips & Tricks

- Use filesystem provider for offline/free testing
- Useful loggers: wire & headers
- Check tests for sample code
- Don't reuse containers for testing



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It's All About Content!



- Content types matter
- Use Content-Type and Content-Disposition as necessary

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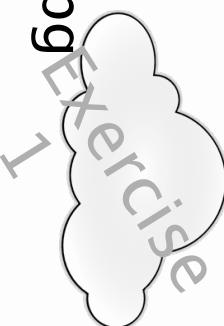
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It's All About Content!

TODO

1. Create blob from cloud.jpg
2. Upload to container, make readable publically
3. Get public URI
4. Paste URL into browser (erm,)



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Scattergun

TODO

1. Start timer
2. Upload all five S3 documentation files
3. Measure time
4. Switch to async uploads
5. Report when all uploads have

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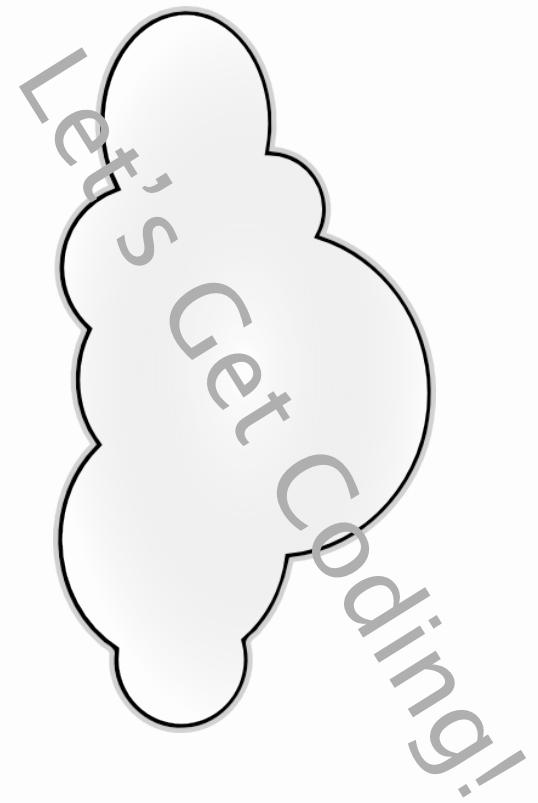
Let's Get Coding!

Exercise 2

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Exercise 3

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Scattergun



- Can often do multiple tasks asynchronously
- Use listeners to wait for completion
- Useful abstraction: `async`

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Now You See It...

- Be aware of your providers' consistency models
- Use appropriate metadata (user metadata, if necessary) to determine consistency
- Can read metadata without

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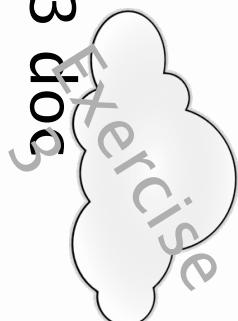
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Now You See It...

TODO

1. Start async upload of S3 doc
2. Wait until blob "exists"
3. Download blob and compare
4. Repeat, using more accurate metadata to determine



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Sort It!

TODO

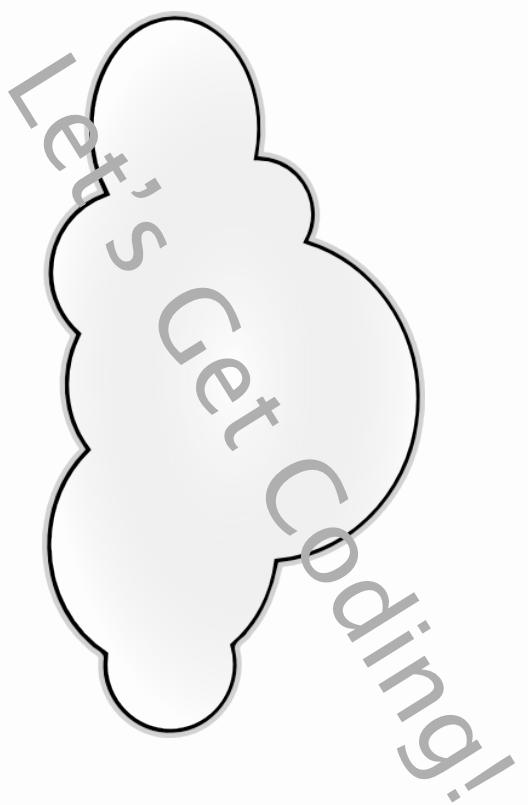
1. Upload S3 docs to one folder, other docs to a different folder in your container
2. List the contents of both



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Exercise 4

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Sort It!

- Can have folder structures in blobstores
- Supported natively by some providers, simulated in others
 - Useful for organising files
 - Public/private access

Exercise
4

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From Here

- Demos, startup guides and examples

- Come to our session!

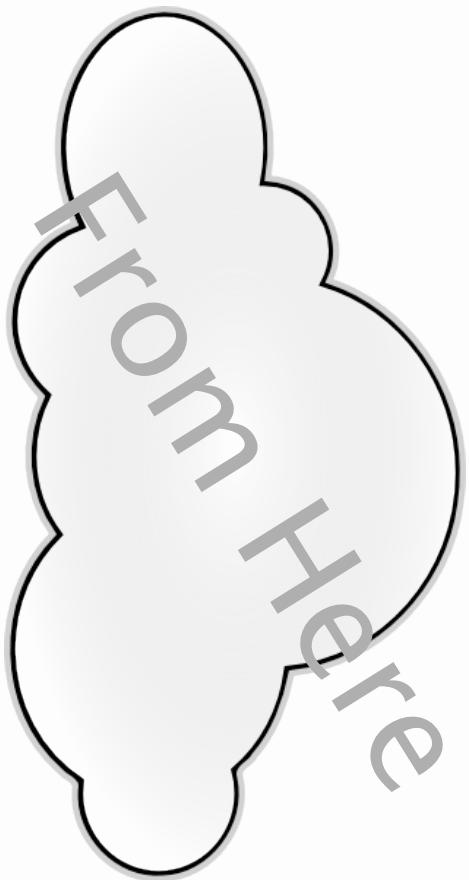
- Oh, wait, you've seen the slides already...
- github.com/demobox/jclouds-devboxx11-lab

- Compute & LoadBalancer APIs too

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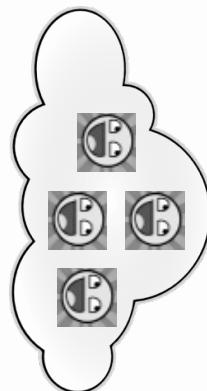


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Come Hang Out!



- jclouds@googlegroups.com
- [@jclouds](#)
- IRC #jclouds on freenode
- work for **cl_{oud}soft!**

Bringing Business to the Cloud

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More Info



- <http://www.jclouds.org>
- <http://github.com/jclouds/jclouds>
- <https://github.com/jclouds/jclouds-examples>
- <http://www.cloudsoftcorp.com/news/cloudsoft-launches-professional-open-source-support-for-jclouds/>
- <http://www.cloudsoftcorp.com/wp-content/uploads/jclouds-Datasheet-Web.pdf>

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multi - cloud library

