

Cloudfork

cloud computing using Smalltalk



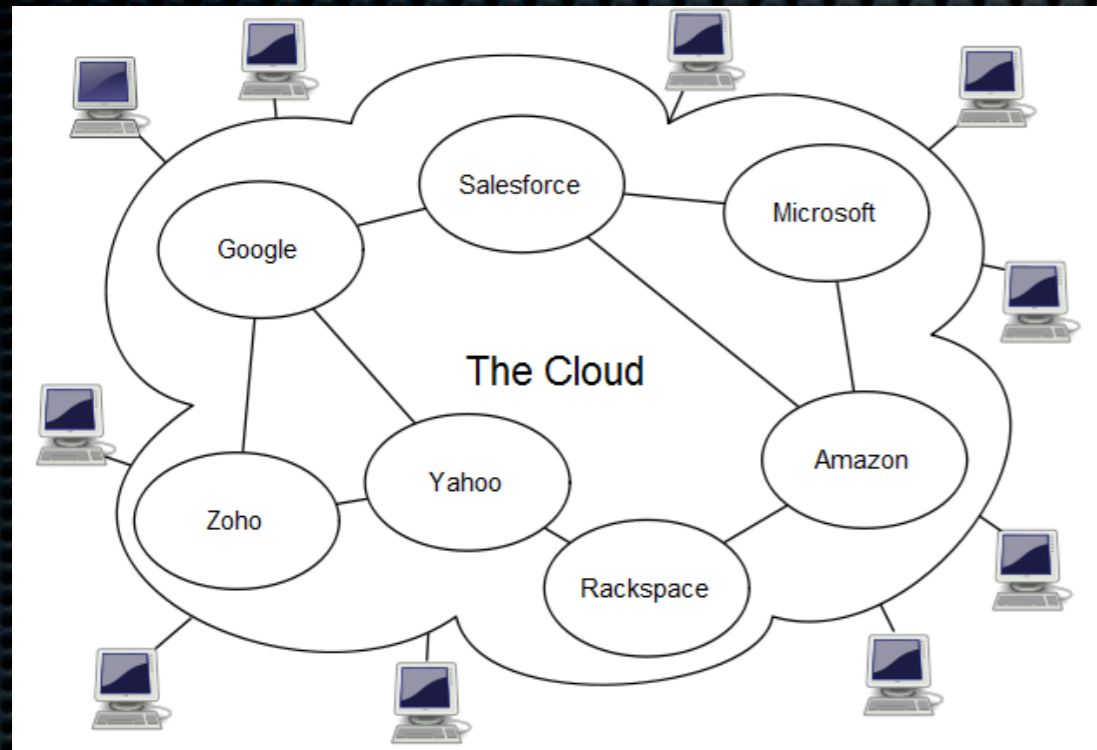
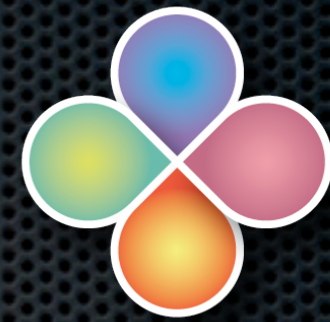
Ernest Micklei & Jan van de Sandt
ESUG 2009, Brest, France

Talking about



- ✦ Cloudfork and Cloud Computing
 - ✦ what is there and how can it be used ?
- ✦ ActiveItem
 - ✦ demo
- ✦ Future of Cloudfork ?
 - ✦ discussion !

Cloud Computing



Cloud computing is a style of computing in which **dynamically scalable** and often **virtualized resources** are provided as a service over the Internet. Users need not have knowledge of, expertise in, or control over the technology infrastructure in the "cloud" that supports them.

Cloudfork



- ✦ Cloudfork
 - ✦ interfaces to use Cloud Computing services
 - ✦ portable Smalltalk
 - ✦ open source (MIT)
- ✦ focus on Amazon Web Services (AWS)

Cloudfork AWS



- ✦ interfaces to Amazon WebServices
 - ✦ Simple Storage Service (S3)
 - ✦ Simple Queuing Service (SQS)
 - ✦ SimpleDB
 - ✦ Elastic Cloud Computing (EC2)

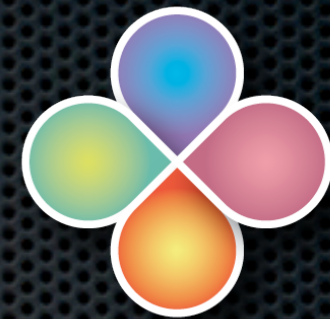


AWS in general



- ✦ Pay-per-use, low cost
- ✦ High Availability
- ✦ SOAP + REST api
- ✦ Global accessible
- ✦ Architecture:
 - ✦ BASE: basically available, soft state, eventually consistent
 - ✦ KISS: keep it simple

AWS in dollars*



	Storage	Data transfer	CPU
S3	\$0.15 per GB / month	\$0.10 per GB in \$0.17 per GB out	\$0.01 per 10,000 GET requests
SQS	n.a.	\$0.10 per GB in \$0.17 per GB out	\$0.01 per 10,000 requests
SimpleDB	First 1 GB free \$0.25 per GB / month	First 1 GB free \$0.10 per GB in \$0.17 per GB out	\$0.14 per Machine Hour
EC2	ranging from \$0.10 per hour (small linux) to \$1.20 per hour (extra large windows)		

* see aws.amazon.com for exact pricing

AWS - S3

Simple Storage Service



- ✦ Objects [1 Byte .. 5 GB] in Buckets
- ✦ Unique key within a Bucket
- ✦ meta data
- ✦ streaming
- ✦ distribution (bittorrent)
- ✦ access controlled

Cloudfork - S3



```
s3 := CFSimpleStorageService newWith: awsCredentials.
```

```
s3 createBucketNamed: 'esug.2009.bucket'.
```

```
bucket := s3 openBucketNamed: 'esug.2009.bucket'.
```

```
bucket putObject: 'presenting in Brest, France' as: 'tweet'.
```

```
( bucket getObject: 'tweet' ) result asString.
```

AWS - SQS

Simple Queue System



- ✦ a-synchronous communication
 - ✦ decoupling systems
 - ✦ jobs
- ✦ Private queues
- ✦ 8 KByte messages
- ✦ non-transactional

Cloudfork - SQS



```
sqs := CFSimpleQueueService newWith: awsCredentials.
```

```
url := (sqs createQueue: 'esug-2009-queue') result.
```

```
sqsq := sqs openQueue: url.
```

```
sqsq sendMessage: 'ESUG 2009'.
```

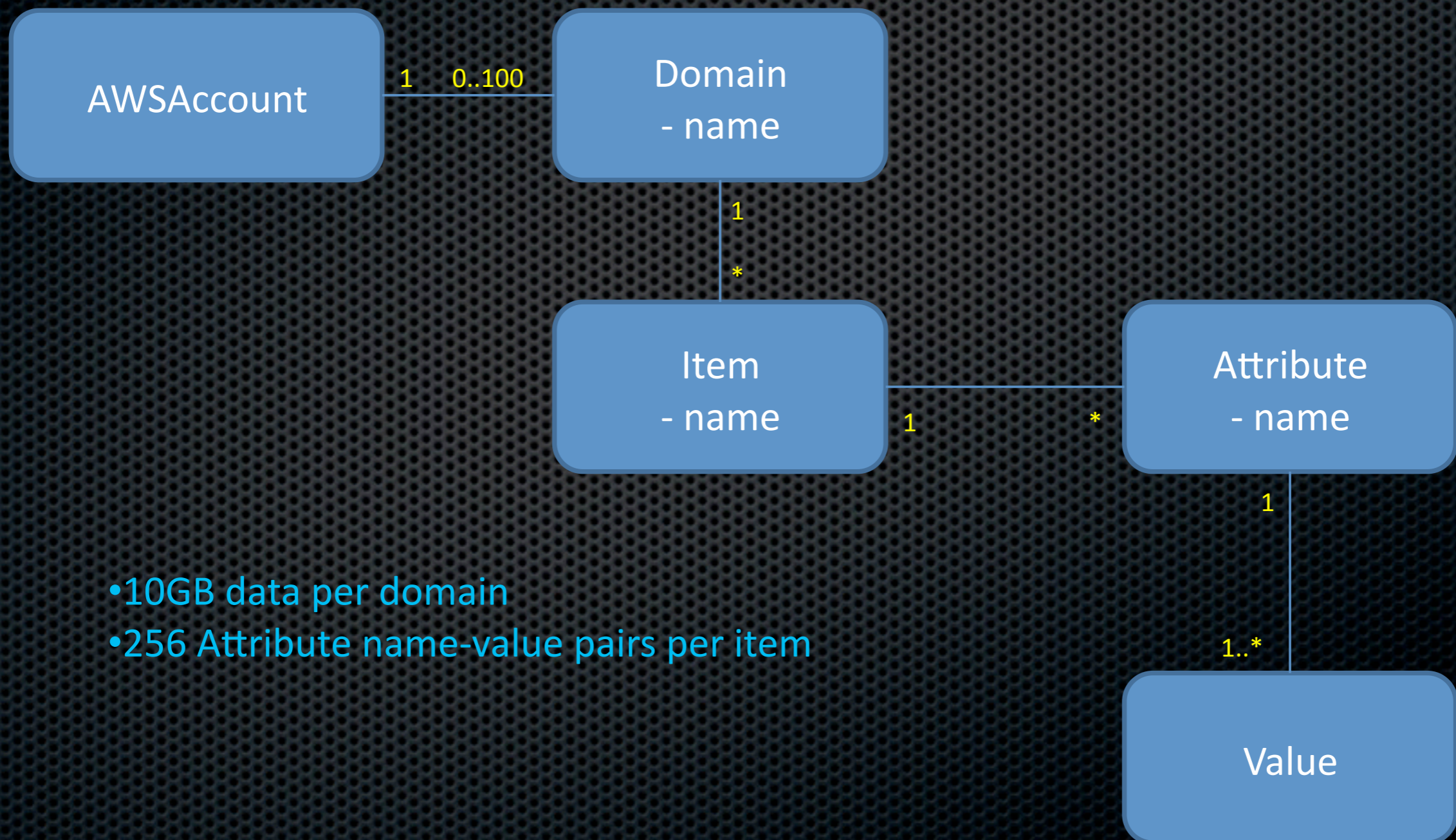
```
msg := (sqsq receiveMessage) result body
```

AWS - SimpleDB



- ✦ “Huge dictionary in the Cloud”
- ✦ domains with items
- ✦ multi-valued attributes
- ✦ Strings only
- ✦ auto-indexed
- ✦ query api

AWS SimpleDB



- 10GB data per domain
- 256 Attribute name-value pairs per item

Cloudfork - SimpleDB



```
simpleDB := CFSimpleDB newWith: awsCredentials.  
  
simpleDB createDomain: 'esug-2009-domain'.  
  
domain := simpleDB openDomain: 'esug-2009-domain'.  
  
item := CFSimpleDBItem new  
    name: 'esug-conference-2009'  
    ; valueAt: 'visitors' put: '400'.  
  
domain itemPut: item.  
  
( domain itemAt: 'esug-conference-2009' ) result.
```

Embrace the Cloud



- ✦ The Cloud is a chance for the Smalltalk vendors to innovate:
 - ✦ New pricing models
 - ✦ Create standard architectures
 - ✦ loadbalancing
 - ✦ different persistence solutions



Cloudfork - ActiveItem



- ✦ ActiveRecord pattern implementation on top of Amazon SimpleDB
- ✦ attribute mappings
- ✦ association mapping
- ✦ save , delete , find

ActiveItem features



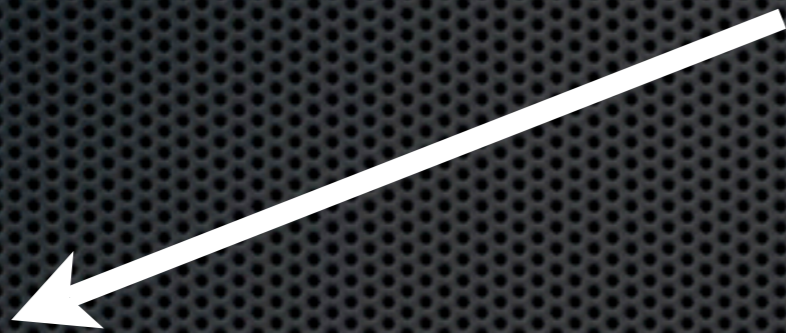
- ✦ auto-mapping common types
- ✦ DSL for relations (belongsTo, hasMany, ownsOne, ...)
- ✦ inheritance
- ✦ validators
- ✦ domain sharding strategies

Domain Sharding



AWS SimpleDB item:

user.dennis	2004-09-16	male
-------------	------------	------



users.a-f

itemName	attribute	...
user.andre		

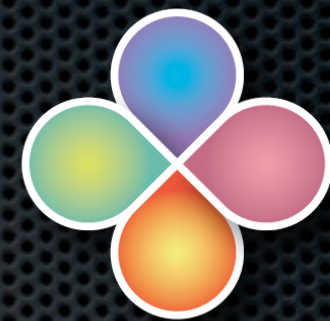
users.g-p

itemName	attribute	...
user.lisa		

users.q-z

itemName	attribute	...
user.theo		

Time to browse...



Future of Cloudfork ?



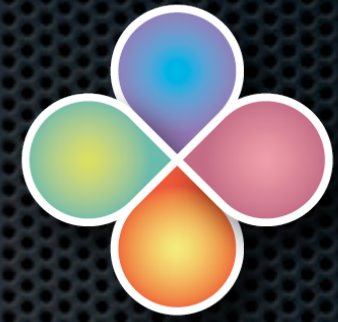
- ✦ complete the API
- ✦ add API to other AWS services
- ✦ other providers

More Amazon APIs ...



- ✦ Auto Scaling
- ✦ Elastic Load Balancing
- ✦ CloudWatch (beta)
- ✦ Cloudfront
- ✦ Elastic MapReduce
- ✦ Flexible Payment Service

More Cloud providers ...



Cloudfork App-engine



- ✦ like Google App Engine
- ✦ upload a prepared image
- ✦ the app-engine deploys it and ensures serviceability and scalability

Add Cloud support for



- ✦ Magritte & Pier
 - ✦ Persistency to SimpleDB and S3
- ✦ Seaside
 - ✦ Hosting on EC2 (+ httpd load balancer front-end)

Build in the Cloud



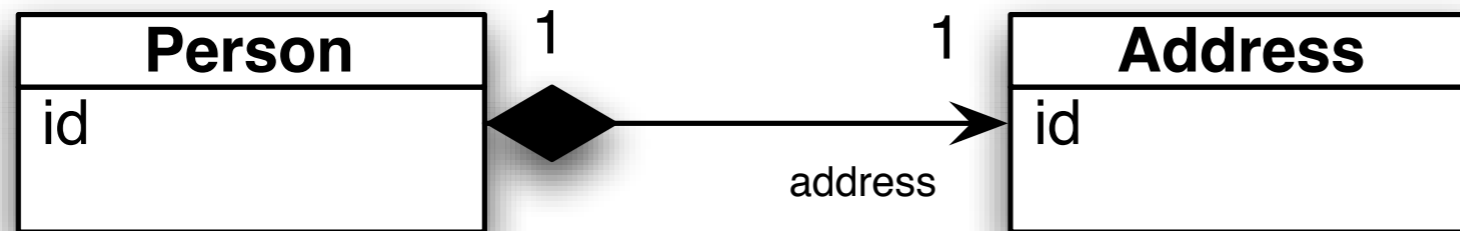
- ✦ Continuous Integration Server in the Cloud
 - ✦ Build Core and Dev images
 - ✦ Test reports
 - ✦ QA reports
 - ✦ Test package compatibility

c'est fini



- ✦ cloudfork.googlecode.com
- ✦ blog.doit.st

ActiveItem composition



Examples:
aPerson address.

aPerson **ownsOne**: #address

=> address is stored in aPerson

ActiveItem - tools



- ✦ SimpleDBEmulator for Unit tests
- ✦ AiBrow for exploring items
 - ✦ Seaside
 - ✦ Glare-DataServices

describing-attributes-typewise

hasBoolean:
hasByteArray:
hasCharacter:
hasData:
hasFloat:
hasInteger:
hasString:
hasStrings:
hasSymbol:
hasText:
hasTime:
hasTimestamp:
hasTimestamps

describing-attributes

hasAttribute:type:
usesClassPrefix:

describing-associations

belongsToMany:
belongsToMany:
hasMany:
hasOne:
ownsMany:
ownsOne:

describing-validations

validatesLengthOf:
validatesLengthOfAll:
validatesPresenceOf:
validatesPresenceOfAll: