



NoSQL Datenbanken am Beispiel von CouchDB

OIO - Hauskonferenz 2011

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Programmierer



Schwerpunkte

Funktionale Programmierung

REST

SOA, XML

NoSQL

Mobile Apps

Membrane

mysql> describe audit_trail;

Field	Type	Null	Key	Default	Extra
id	bigint(20)	NO	PRI	NULL	auto_increment
version	bigint(20)	NO	NULL	NULL	
aktion	varchar(255)	NO	NULL	NULL	
ausgabe_versionsnummer	varchar(255)	YES	NULL	NULL	
ausgabeformat	varchar(255)	YES	NULL	NULL	
bis	datetime	YES	NULL	NULL	
date_created	datetime	NO	NULL	NULL	
gl_version	varchar(255)	NO	NULL	NULL	
praeparate_name	varchar(255)	NO	NULL	NULL	
pu_id	bigint(20)	NO	MUL	NULL	
resulte	varchar(255)	NO	NULL	NULL	
user_id	bigint(20)	NO	MUL	NULL	
von	datetime	YES	NULL	NULL	

mysql> describe pzn;

Field	Type	Null	Key	Default	Extra
id	bigint(20)	NO	PRI	NULL	auto_increment
version	bigint(20)	NO	NULL	NULL	
code	varchar(255)	NO	NULL	NULL	
veroeffentlichung_id	bigint(20)	NO	MUL	NULL	

mysql> describe veroeffentlichung;

Field	Type	Null	Key	Default	Extra
id	bigint(20)	NO	PRI	NULL	auto_increment
version	bigint(20)	NO	NULL	NULL	
von	datetime	NO	NULL	NULL	
bis	datetime	YES	NULL	NULL	
zurueckgezogen	bit(1)	NO	NULL	NULL	
last_updated	datetime	YES	NULL	NULL	

mysql> describe gebrauchsinformation;

Field	Type	Null	Key	Default	Extra
id	bigint(20)	NO	PRI	NULL	auto_increment
version	bigint(20)	NO	NULL	NULL	
erzeuger_id	bigint(20)	NO	MUL	NULL	
qinummer	varchar(255)	NO	NULL	NULL	
gl_version	varchar(255)	YES	NULL	NULL	
last_updated	datetime	NO	NULL	NULL	
meta_daten_xml	longtext	YES	NULL	NULL	
praeparate_name	varchar(255)	YES	NULL	NULL	
process_id	bigint(20)	NO	NULL	NULL	
ref_version	varchar(255)	YES	NULL	NULL	
upcast_log	longtext	YES	NULL	NULL	
veroeffentlichung_id	bigint(20)	YES	MUL	NULL	
gl_stand	varchar(255)	YES	NULL	NULL	

mysql> describe ausgabeformat;

Field	Type	Null	Key	Default	Extra
id	bigint(20)	NO	PRI	NULL	auto_increment
version	bigint(20)	NO	NULL	NULL	
gl_id	bigint(20)	NO	MUL	NULL	
konverter_log	longtext	YES	NULL	NULL	
typ	varchar(255)	NO	NULL	NULL	
uuid	varchar(255)	YES	NULL	NULL	
versionsnummer	varchar(255)	YES	NULL	NULL	
zustand	varchar(255)	NO	NULL	NULL	
last_updated	datetime	YES	NULL	NULL	

mysql> describe id_counter;

Field	Type	Null	Key	Default	Extra
id	bigint(20)	NO	PRI	NULL	auto_increment
version	bigint(20)	NO	NULL	NULL	
count	bigint(20)	NO	NULL	NULL	
name	varchar(255)	NO	NULL	NULL	

mysql> describe berechtigungszeitraum;

Field	Type	Null	Key	Default	Extra
id	bigint(20)	NO	PRI	NULL	auto_increment
version	bigint(20)	NO	NULL	NULL	
bis	datetime	YES	NULL	NULL	
von	datetime	NO	NULL	NULL	

mysql> describe person;

Field	Type	Null	Key	Default	Extra
id	bigint(20)	NO	PRI	NULL	auto_increment
version	bigint(20)	NO	NULL	NULL	
aktiv	bit(1)	NO	NULL	NULL	
berechtigungszeitraum_id	bigint(20)	YES	MUL	NULL	
description	varchar(255)	NO	NULL	NULL	
enabled	bit(1)	NO	NULL	NULL	
nachname	varchar(255)	NO	NULL	NULL	
passwd	varchar(255)	NO	NULL	NULL	
pu_id	bigint(20)	YES	MUL	NULL	
username	varchar(255)	NO	UNI	NULL	
vorname	varchar(255)	NO	NULL	NULL	

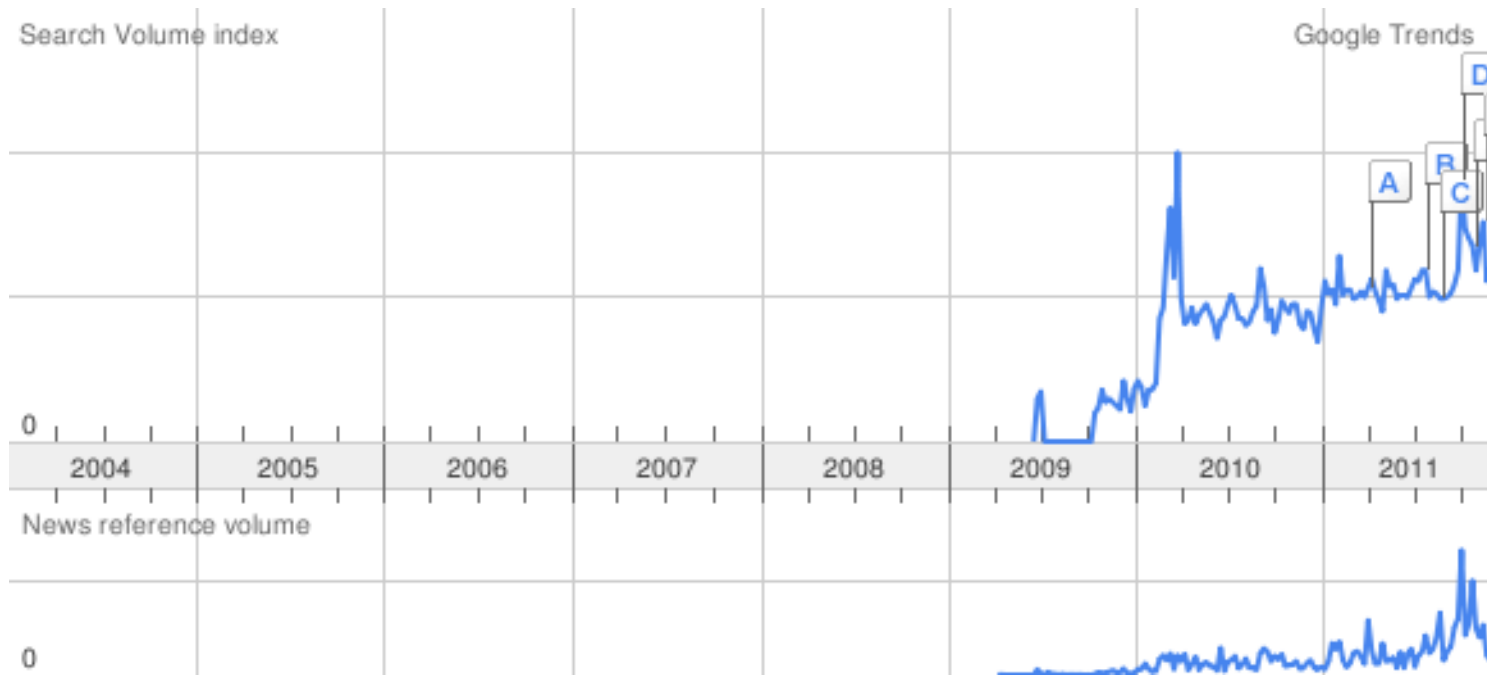
mysql> describe unternehmen;

Field	Type	Null	Key	Default	Extra
id	bigint(20)	NO	PRI	NULL	auto_increment
version	bigint(20)	NO	NULL	NULL	
adresse_id	bigint(20)	NO	MUL	NULL	
name	varchar(255)	NO	NULL	NULL	
teilnahme_fachinfo	bit(1)	YES	NULL	NULL	
teilnahme_service	bit(1)	YES	NULL	NULL	
teilnahme_rufe_liste	bit(1)	YES	NULL	NULL	

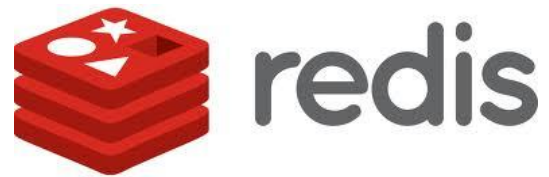
mysql> describe adresse;

Field	Type	Null	Key	Default	Extra
id	bigint(20)	NO	PRI	NULL	auto_increment
version	bigint(20)	NO	NULL	NULL	
email	varchar(255)	NO	NULL	NULL	
fax	varchar(255)	NO	NULL	NULL	
internet	varchar(255)	NO	NULL	NULL	
land	varchar(255)	NO	NULL	NULL	
ort	varchar(255)	NO	NULL	NULL	
plz	varchar(255)	NO	NULL	NULL	
strasse	varchar(255)	NO	NULL	NULL	
telephone	varchar(255)	NO	NULL	NULL	

!SQL



```
map.put("ort", "Mannheim")  
value = map.get("ort")
```

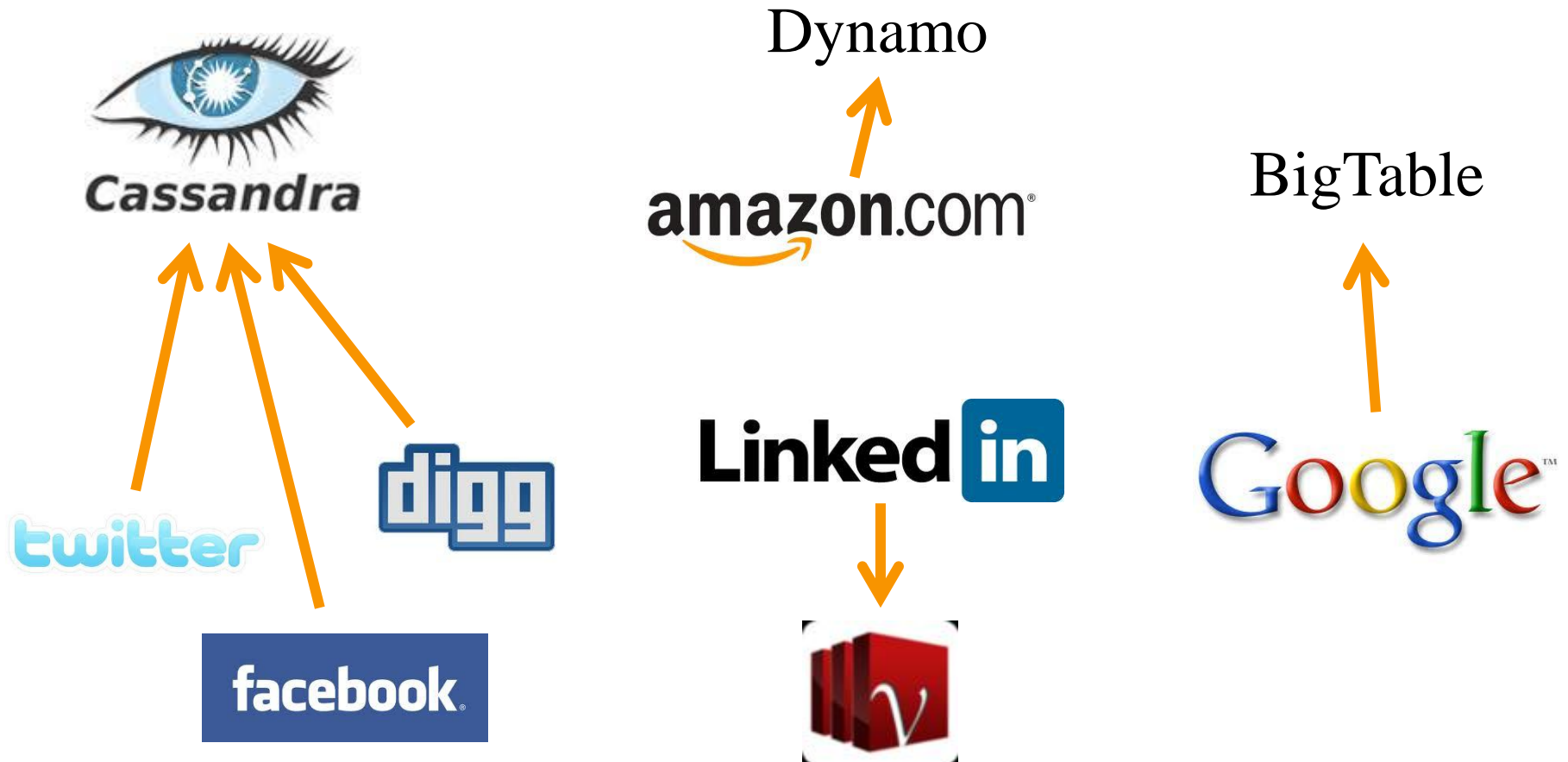


FlockDB











Cluster of unreliable commodity Hardware DataBase

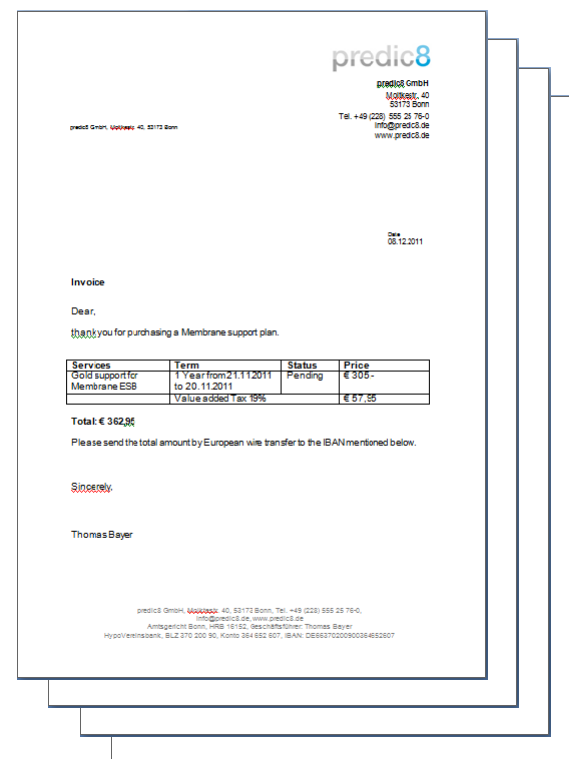
```
-module (ping_pong) .  
-export ([ping/0, pong/0]) .
```

```
ping() ->  
    Pong = spawn (ping_pong, pong, []),  
    Pong ! {self(), ping},  
    receive  
        pong ->  
            pong  
    end.
```

```
pong() ->  
    receive  
        {Ping, ping} ->  
            Ping ! pong  
    end.
```

Quelle: [http://de.wikipedia.org/wiki/Erlang_\(Programmiersprache\)](http://de.wikipedia.org/wiki/Erlang_(Programmiersprache))

```
{
  "firstname": "Thomas",
  "lastname": "Bayer",
  "city": "Bonn",
  "email": thomas.bayer@oio.de
}
```



```
{  
  "firstname": "Thomas",  
  "lastname": "Bayer",  
  "city": "Bonn",  
  "email": [ "thomas.bayer@oio.de",  
             "thomas.bayer@predic8.de" ]  
}
```

Overview > filesdb

+ New Document Jump to: View: Stale views

Security... Compact & Cleanup... Delete Database...

Key ▲	Value
"0000ad37ae8bd48d7c681b3051000dbb" ID: 0000ad37ae8bd48d7c681b3051000dbb	{rev: "1-39bc8a6241f4a6e7edacd53394333b0b"}
"0000ad37ae8bd48d7c681b3051000fa1" ID: 0000ad37ae8bd48d7c681b3051000fa1	{rev: "1-ad18e9205c3e903e62ec475507de1b0e"}
"0000ad37ae8bd48d7c681b3051001b3d" ID: 0000ad37ae8bd48d7c681b3051001b3d	{rev: "1-1b0aada01c6694237671fbf121128f02"}
"0000ad37ae8bd48d7c681b3051002849" ID: 0000ad37ae8bd48d7c681b3051002849	{rev: "1-e5c43e88f8a2e363627dbfea0430528b"}
"0000ad37ae8bd48d7c681b3051003742" ID: 0000ad37ae8bd48d7c681b3051003742	{rev: "1-7752e0604b8773c16032f276fb6cb2d7"}
"0000ad37ae8bd48d7c681b30510042e0" ID: 0000ad37ae8bd48d7c681b30510042e0	{rev: "1-951d87a83cfa5abda68b4a99886545b0"}
"0000ad37ae8bd48d7c681b30510051d5" ID: 0000ad37ae8bd48d7c681b30510051d5	{rev: "1-bfcacb92a3273ac87adb3b85fab5c3f3"}
"0000ad37ae8bd48d7c681b30510059b4" ID: 0000ad37ae8bd48d7c681b30510059b4	{rev: "1-a29052652f162b80d961c63c27719760"}
"0000ad37ae8bd48d7c681b30510061d8" ID: 0000ad37ae8bd48d7c681b30510061d8	{rev: "1-a77a5f915b801d5311aa5207fea20679"}
"0000ad37ae8bd48d7c681b3051006bb6" ID: 0000ad37ae8bd48d7c681b3051006bb6	{rev: "1-48a7cd3c360aca7ace94c5ae0a101e89"}

Showing 1-10 of 323060 rows ← Previous Page | Rows per page: | Next Page →

Overview > filesdb

+ New Document
 Security...
 Compact & Cleanup...
 Delete Database...
 Jump to:
 View: Temporary view...
 Stale views

▼ View Code

Map Function: <pre>function(doc) { var tmp = doc.name.split("."); var ext = tmp[tmp.length -1] if(ext.length < 3 ext.length >4) return emit(ext, doc.size); }</pre>	Reduce Function (optional):
--	-----------------------------

 Language:
 =

Warning: Please note that temporary views are not suitable for use in production, as they are really slow for any database with more than a few dozen documents. You can use a temporary view to experiment with view functions, but switch to a permanent view before using them in an application.

Key ▲	Value
"asmx" <small>ID: 80dd5407444984d56f3b0f2a86b61547</small>	29068
"asmx" <small>ID: 80dd5407444984d56f3b0f2a86b62215</small>	13047
"asmx" <small>ID: 80dd5407444984d56f3b0f2a86b63008</small>	74405
"asmx" <small>ID: 80dd5407444984d56f3b0f2a86b64e4b</small>	17292
"bat " <small>ID: 80dd5407444984d56f3b0f2a860cd75d</small>	1116
"bat " <small>ID: 80dd5407444984d56f3b0f2a860fc875</small>	1116
"bat " <small>ID: 80dd5407444984d56f3b0f2a860ff17d</small>	793
"bat " <small>ID: 80dd5407444984d56f3b0f2a863a4b5a</small>	1116
"bat " <small>ID: 80dd5407444984d56f3b0f2a86485f43</small>	400
"bat " <small>ID: 80dd5407444984d56f3b0f2a86b65fa5</small>	120

Showing 1-10 of 1628 rows ← Previous Page | Rows per page: | Next Page →

Overview > filesdb

New Document
 Security...
 Compact & Cleanup...
 Delete Database...
 Jump to:
 View:
 Stale views

▼ View Code

<p>Map Function:</p> <pre>function(doc) { var tmp = doc.name.split("."); var ext = tmp[tmp.length -1] if(ext.length < 3 ext.length >4) return emit(ext, doc.size); }</pre>	<p>Reduce Function (optional):</p> <pre>function(key, values) { return sum(values); }</pre>
--	---

 Language:
 =

Warning: Please note that temporary views are not suitable for use in production, as they are really slow for any database with more than a few dozen documents. You can use a temporary view to experiment with view functions, but switch to a permanent view before using them in an application.

Key ▲	Grouping: <input type="button" value="exact"/>	Value	<input checked="" type="checkbox"/> Reduce
"asax"		133812	
"bat"		4661	
"bmp"		455766	
"bpel"		111637	
"casa"		5030	
"cer"		3660	
"conf"		130	
"css"		606248	
"csv"		149	
"doc"		5066752	

Showing 1-10 of unknown rows ← Previous Page | Rows per page: | Next Page →

```
curl -X GET http://192.168.56.101:5984/my_friends/3
```

```
{ "_id": "3",  
  "_rev": "1",  
  "firstname": "Mandy",  
  "lastname": "Mcdonnell",  
  "city": "Salem",  
  "email": mndy@mcdonnell.com  
}
```

```
curl -X POST -d '{"firstname':'Mandy', 'lastname':  
  'Mcdonnell', 'city': 'Salem', 'email':  
  'mndy@mcdonnell.com'}" -H "Content-Type:  
  application/json"  
  http://192.168.56.101:5984/my_friends/
```

```
{"ok":true,"id":"5","rev":"1"}
```

```
curl -X PUT -d '{"_rev': '1-  
52a806e1eead7d337ab0319197400fd5',  
'firstname': 'Mandy', 'lastname': 'Mcdonnell',  
'city': 'Salem', 'email': 'mandy@mcdonnell.com'}"  
-H "Content-Type: application/json"  
http://192.168.56.101:5984/my_friends/3
```

```
{"ok": true, "id": "3", "rev": "2"}
```

```
curl -X DELETE http://192.168.56.101:5984/my_friends/3
```

```
{"ok":true,"id":"3","rev":"3"}
```

- GET, Modify, POST
- POST => neue Revision
- Keine Manipulation von bestehenden Daten
- POST kann sich mit GET überschneiden

```
function(doc) {  
    var c = doc.name.split(".");  
  
    return emit(c[c.length - 1] , doc.size);  
}
```


POST /offer/786



predic8 GmbH
Mühlweg, 40
53173 Bonn
Tel. +49 (228) 555 25 75-0
info@predic8.de
www.predic8.de

predic8 GmbH, Mühlweg 40, 53173 Bonn

Dear,

Thank you for purchasing a

Services	Term	Price
Cold support for Membrane ESS	1 Year	€ 362,50

Total € 362,50

Please send the total amount by European wire transfer to the IBAN mentioned below.

Sincerely,

Thomas Bayer

predic8 GmbH, Mühlweg 40, 53173 Bonn, Tel. +49 (228) 555 25 75-0, info@predic8.de, www.predic8.de
Ambergertstr. Bonn, HRB 16153, Geschäftsführer: Thomas Bayer
Hypovertensbank, BLZ 370 200 90, Konto 284 652 607, IBAN: DE66870200900384652907

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Mühlweg, 40
53173 Bonn
Tel. +49 (228) 555 25 75-0
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53173 Bonn
Tel. +49 (228) 555 25 75-0
info@predic8.de
www.predic8.de

predic8 GmbH, Mühlweg 40, 53173 Bonn

Dear,

Thank you for purchasing a Membrane support plan.

Services	Term	Status	Price
Cold support for Membrane ESS	1 Year from 21.11.2011 to 20.11.2011	Pending	€ 362,50
Value added tax 19%			€ 57,55

Total € 362,50

Please send the total amount by European wire transfer to the IBAN mentioned below.

Sincerely,

Thomas Bayer

predic8 GmbH, Mühlweg 40, 53173 Bonn, Tel. +49 (228) 555 25 75-0, info@predic8.de, www.predic8.de
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Hypovertensbank, BLZ 370 200 90, Konto 284 652 607, IBAN: DE66870200900384652907

kill -9 423

- N-Master
- Offline arbeiten und dann synchronisieren
- Konflikt Erkennung und Behebung
- Merge

- Nur in eine Richtung
- Überträgt Dokumente, die sich unterscheiden
- Jede Änderung wird mit DB Sequenznummer versehen
 - Effiziente Replication
- Manuel oder Continuous

Multi Version Concurrency Control

- Optimistic Locking
- Keine Versionskontrolle

- Konflikte werden erkannt
- Alle Knoten lösen Konflikte gleich
 - Wining/Losing Revision
- Merge analog zu Subversion

- Einfache Entwicklung
- Robust
- Replication
- Built of/for the Web

- John Quinn, **Presentation: NoSQL: Dealing with the Data Deluge**
<http://nosql.mypopescu.com/post/535275826/presentation-nosql-dealing-with-the-data-deluge>
- <http://damienkatz.net/>
- CouchDB: The definite Guide
 - <http://guide.couchdb.org/>
- NoSQL Tutorial: CouchDB mit Java
 - <http://predic8.de/couchdb-tutorial.htm>



Orientation in Objects



Fragen ?

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Vielen Dank für ihre Aufmerksamkeit !

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