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## Behind the Clouds

Brave New World of Cloud  
Computing

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# jax<sup>®</sup>09

Konferenz für Java™, Enterprise Architekturen, SOA

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Saturday, 18 April 2009

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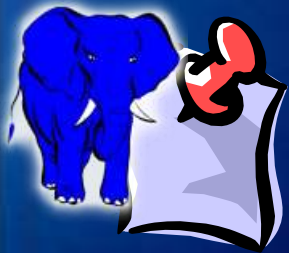
Saturday, 18 April 2009

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**Within ten years all software  
will run on clouds**

**The world is a big cloud of  
services**

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**The purpose of clouds is to  
execute any software component  
on any suitable computer**

**The world is a big cloud of  
services**

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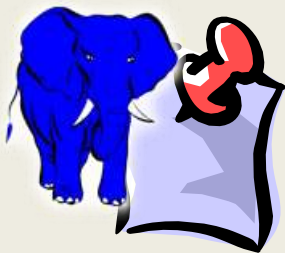


## Classical Uses

### Parallel Execution

- ✓ E.g. Simulation
- ✓ E.g. Search

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Virtualization can be done on processor level and making many CPU appear as one computer or by generally keeping apps in component bubbles

## Use Case: Virtualization



- **Sharing CPU power**
  - run multiple OS on one CPU
- **Sizing of CPU**
  - Share one OS across many CPU
- **SOA Cloud**
  - Common execution frameworks
  - Allow distribution of code bubbles
    - *Active/X, JNLP*
  - Loose coupling via Queues



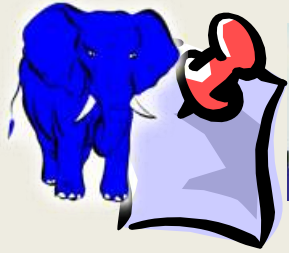
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**Clouds extend Multiprocessor  
idea to the internet**

**All based on Client Server  
(Service-oriented Architecture)**

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# Search Parallel and Combine Results Only



Comp 1

Search

Doc

Comp 2

Search

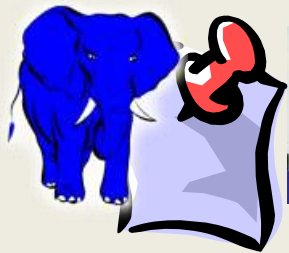
Doc

Comp 3

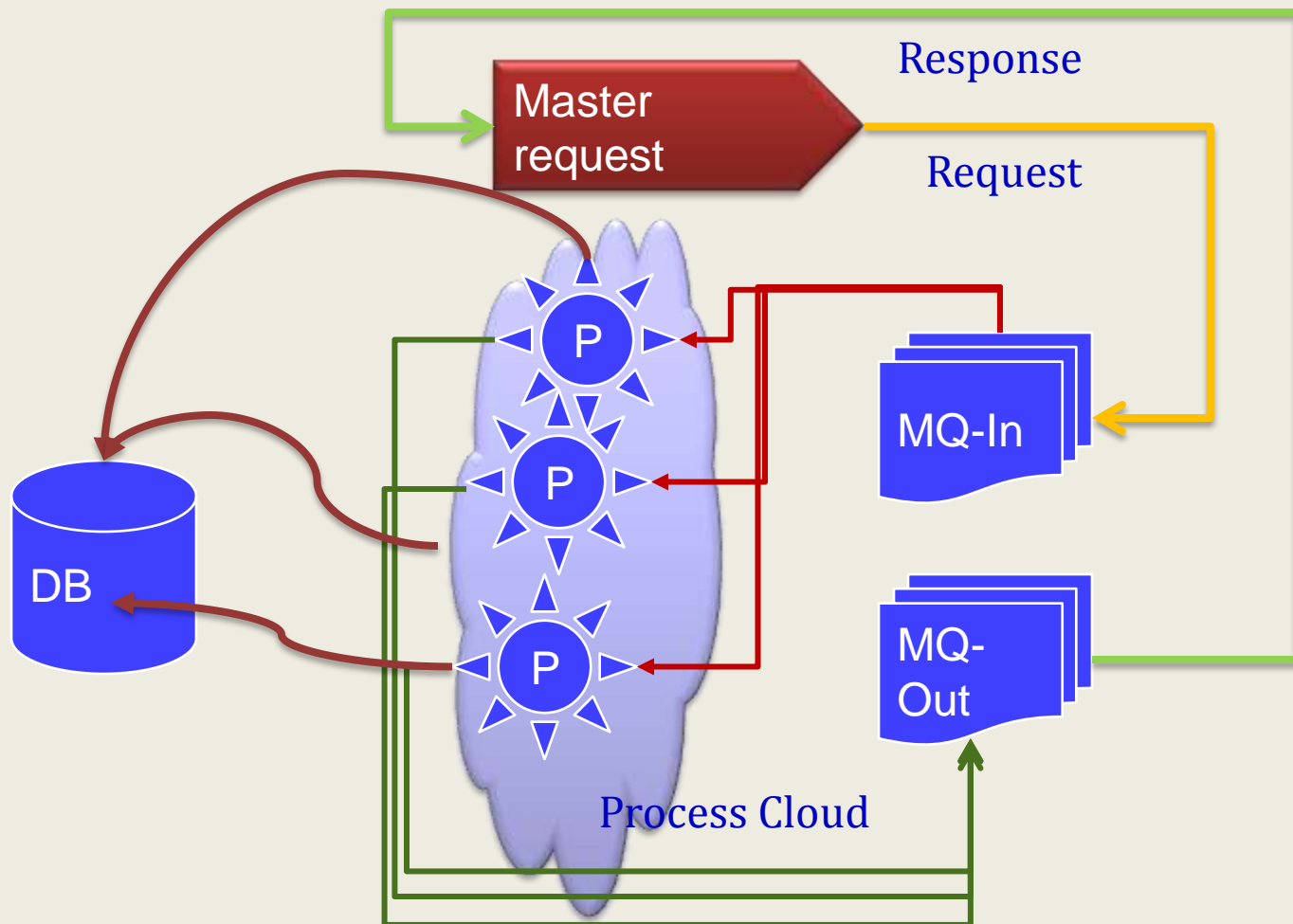
Search

Doc

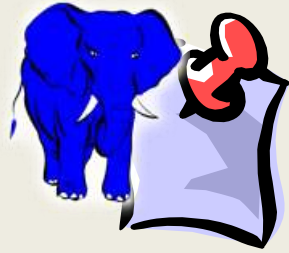
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# Example of Cloud Processing



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# Anybody can apply as „process“



- 1. Monitor the MQ**
- 2. Pick the request**
- 3. Decide if process can be handled**
- 4. Download code if needed**
- 5. Process**
- 6. Return result to MQ-Out**



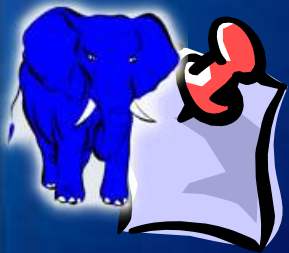
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**Mind: Any computer can do!**

**It simply needs to be able  
to run disposable code**

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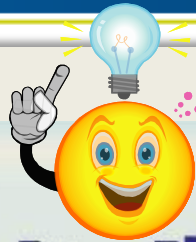
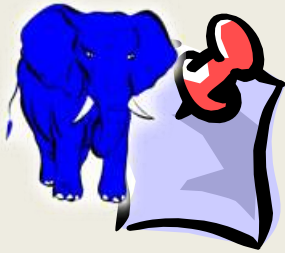


## Looking for the „Killer Cloud“

Clouds solve the security dilemma of distributed architecture

✓ Do not think in firewalls and mere encryptions

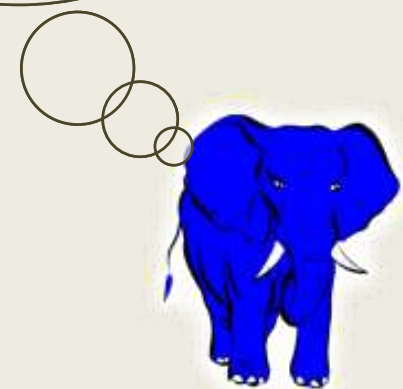
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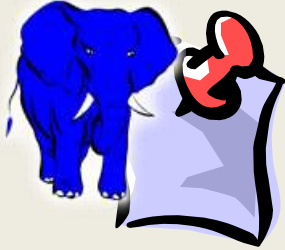
Clouds solve the security dilemma by storing data as a hologram. In a hologram the picture is both redundantly stored and never in one single place

**Clouds save security dilemma!**

**Clouds can store data as a hologram!!**



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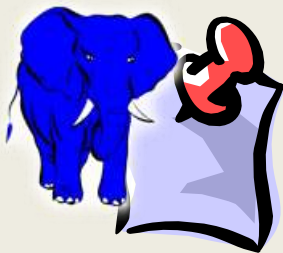
Amazon storage is more secure than anything else since it randomizes data and keeps data redundant



## Storing in a cloud is secure by design!

- ✓ Many companies outsource their backups to AMAZON Storage
  - ✓ This is more secure than anything else
- ✓ Instead of building fences keep key and lock separate

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The trick works by having many different servers that only store a small amount of the whole hologram

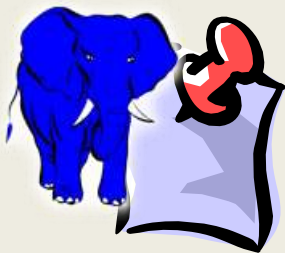
## How distributed storage can solve it



# Distributed Storage

- There are thousands of storage servers!
- Data is cut into small bubbles!
- Several clones of each bubble are created
- Each bubble copy is sent randomly to some storage server

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## Reassemble the Pieces

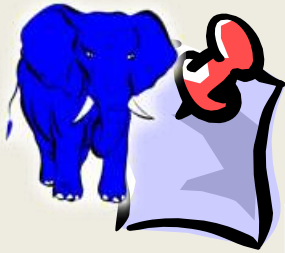


In terminator the enemy robot can „recover“ from destruction by reassembling the „bubbles“; wounds heal the same way.

### ■ Works like the robot in Terminator!

- A request is sent out
- One piece is the root element
- The element sends out a request for a peer
- The peer reacts and sends out search for more peers

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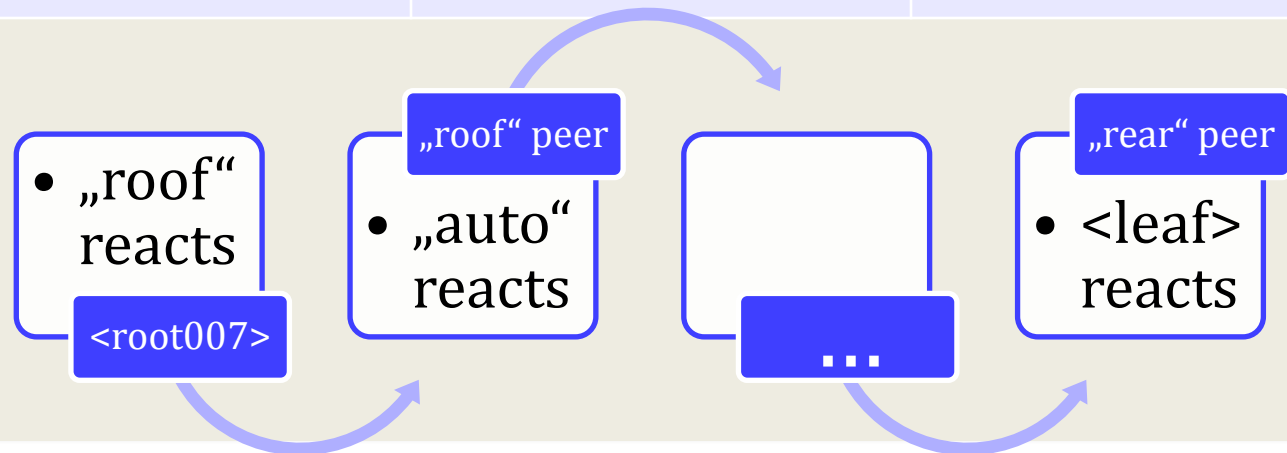


The chunks  
send a  
search  
request for  
their  
children

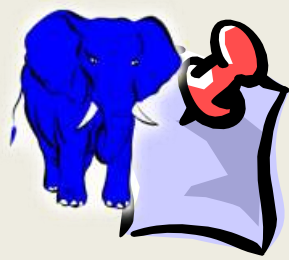
## Example of a data cloud



DATA	ID	PEER
H	roof	<root007>
U	auto	roof
N	hour	auto
G	love	hour
R	rear	love
Y	<leaf>	rear



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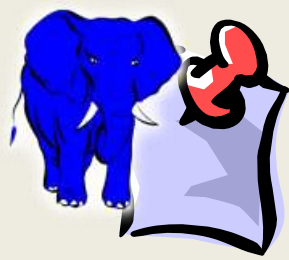


Clouds create complete new dimension



**Many new applications are now possible**

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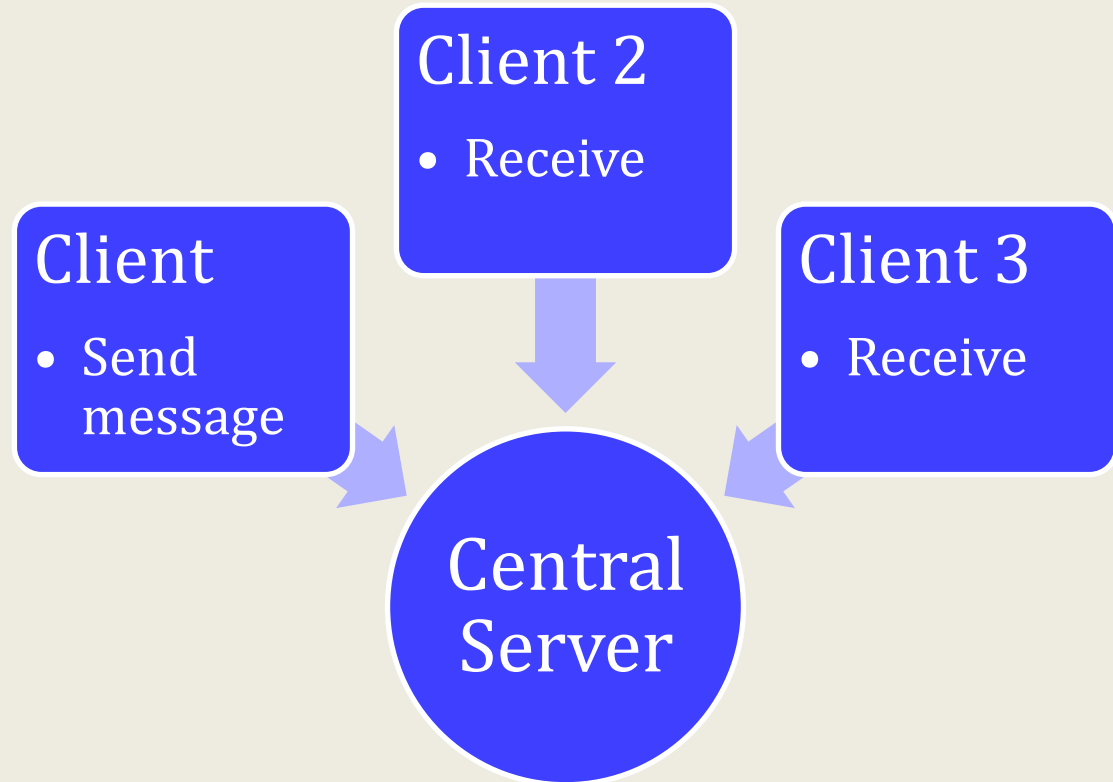


# Example : Web Conf - Classic

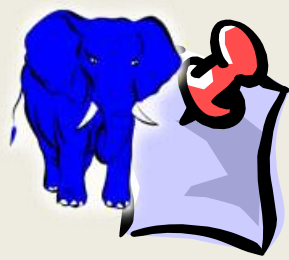


## Classical Approach:

- All data stored and replicated through a central communication hub



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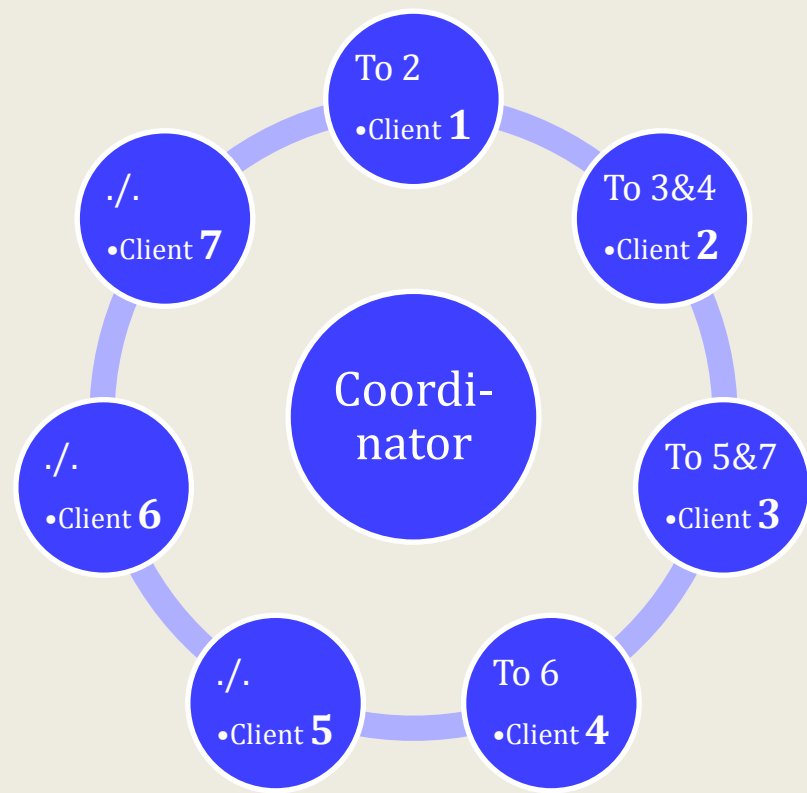


# Example : Web Conf - Cloud



## Cloud Approach:

- Distribution via peer: exponentially faster





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**Yes We Can Cloud!**

**We are the cloud!**

**Cloud is the future!**

**The world one computer!**



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## India makes clouds possible

- ✓ Fiorano
- ✓ SOA Matrix
- ✓ Zahdoo
- ✓ Inventys



**The World → One Computer!**

**DON'T  
PANIC**

**42?**



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## The World → One Cloud!

- ✓ Dhanyawada galu!
- ✓ Sukria!
- ✓ Nandri!
- ✓ Thank You!
- ✓ Danke schön!