

# Merge Replication for Offline Data Mobility

Real life experiences and designs. No  
more window stickers on the cloud.

# Who is Ted Krueger?

Here is the 5 second blurb...

**Magenic**  
Custom solutions that fit. Guaranteed.



SQL Server MVP

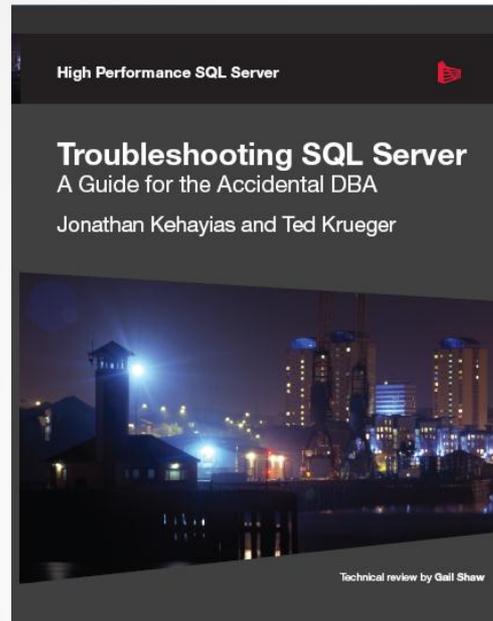
Friends of Red Gate

One of the Founders of LessThanDot.com

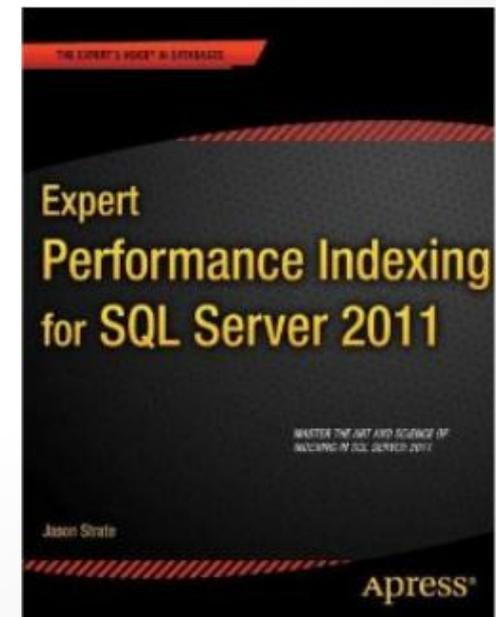
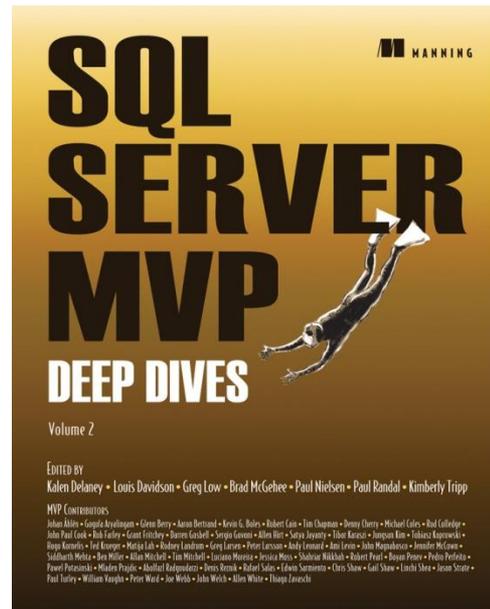
PASS Regional Mentor – North Central Region

**redgate**  
friend of Red Gate

# Books, PASS, Company and all that



**Magenic**



# FREE SQL TRAINING!!!!



← **April, 21nd**

#118 | WISCONSIN 2012

**May, 19th** →



#119 | CHICAGO 2012

# Our goal and time together

- Design
  - Database
  - Replication – Why Merge
  - Partitions
  - Filters
- Setup/Administration
  - Scripting setup – DR/HA
  - Key tables (genhistory, contents, tombstone)
  - Indexing
  - When to call support
  - What devices can I use
- The future
  - Rumors it's dead
  - Cloud
- Conclusions - Questions



# Designs to consider

- What is your hardware?
  - Laptops
  - Tablets
  - Smart Phones
- How are we going to replicate?
  - Windows Synchronization
  - Replication Management Objects (RMO)
- Handling Failures
- Publishers, Re-Publishers, Subscribers
- Oh yeah, how do we setup replication?
  - My monster publication will be the death of your business!



# Conflicts

- COM Based Resolution
  - A bit outdated but handling column level tracking
  - Register conflicts into /CODEBASE
- Business Logical
  - Business logic ability when a “merge” occurs.
    - InsertHandler
    - UpdateHandler
    - DeleteHandler

# Hardware

- Laptops
  - Multi-Processing Power
  - Local instance power with Express
- Tablets
  - SQL Server - Nope
    - SQLite
- The Smart Phone
  - Droid
  - iPhone
  - Windows Phone

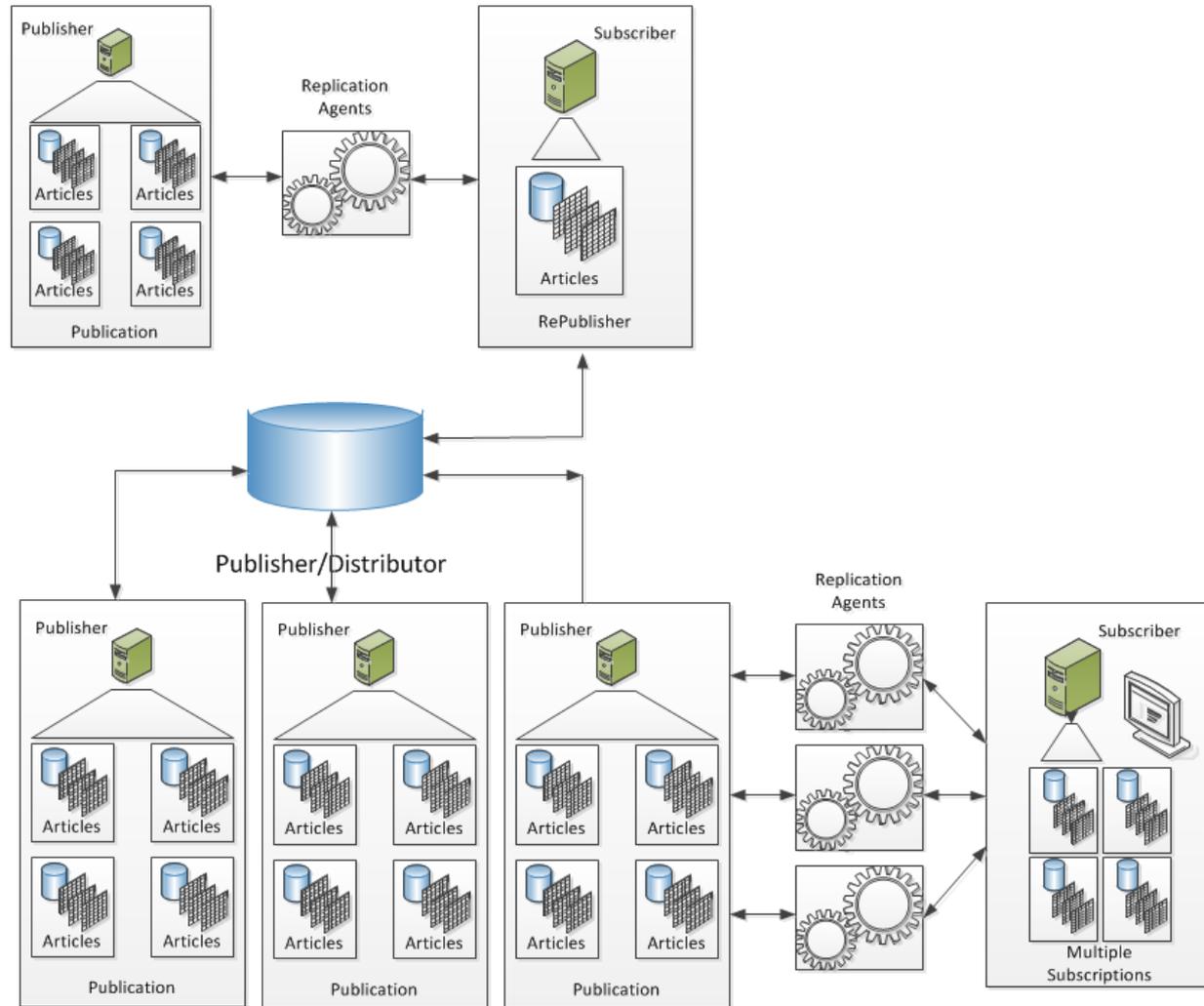
# How are we going to replicate?

- Windows can do that
  - Windows Synchronization
- Custom Development – More likely
  - C#/VB.NET with RMO
    - Let's look
  - Have to mention scripting
    - PowerShell
    - VBScript – yeah, I said it
- If you are loaded to the teeth with money
  - SQL Server Full Editions
    - SQL Agents

# Failures

- Replication Never Fails!
- OK, it does
  - Re-Initializations
    - Design is important here
    - Time
    - Speed – Remote, remote and remote users

# Building a stable landscape



# Building a stable landscape

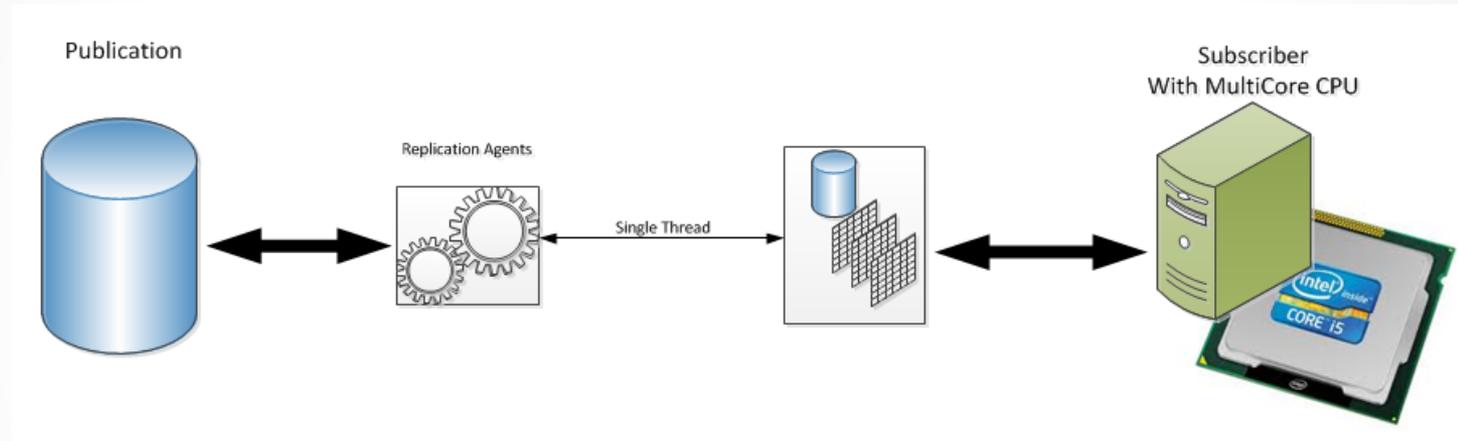
- Key points of failure
  - Disaster Recovery
    - Time to full recovery
    - Periodic spans of disconnection between publishers and re-publishers
  - High Availability
    - Mirroring does work with replication
      - But...
- The massive one publication issues
  - Re-Initialization
  - Managing Failures
  - Rapid Developing Applications
    - Schema changes
    - Schema additions
    - Publication add-ons

# Designing Publications

- One Publication
  - Data Volume
  - Processing Time
  - Design promoting this
    - Should it be Merge?
- Two or more Publications
  - Taking advantage of processing multiple agents in parallel
  - Data Integrity Concerns
  - Failures
    - Should it be Merge?
- Normal SQL Server Processing in play
  - Locking/Blocking
  - Hardware Resources
  - CPU/Memory
  - Indexing

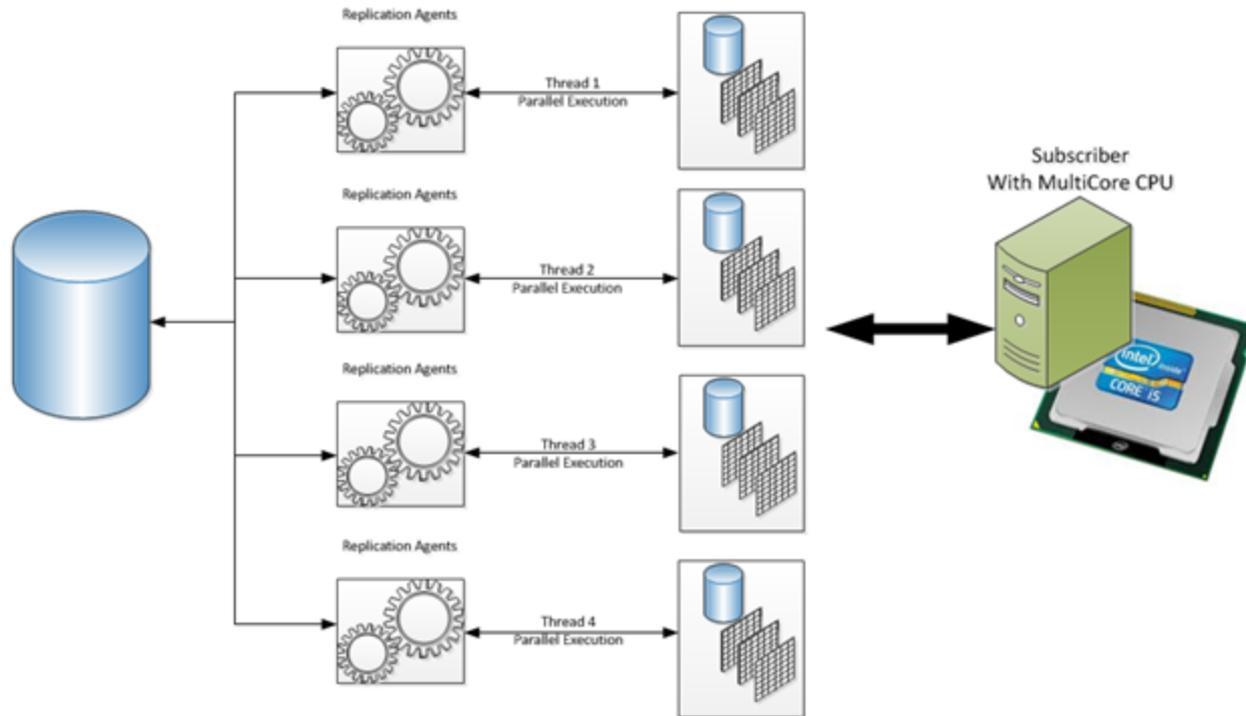
# Multi-Core Logic

- This



# Multi-Core Logic

- This



# Demo Parallel Application

```
var taskIndex = -1;
```

```
Task[] tasks = new Task[]  
    {  
        Task.Factory.StartNew(() => { repl("Pub_1"); }},  
        Task.Factory.StartNew(() => { repl("Pub_2"); }},  
        Task.Factory.StartNew(() => { repl("Pub_3"); }},  
        Task.Factory.StartNew(() => { repl("Pub_4"); }},  
    };
```

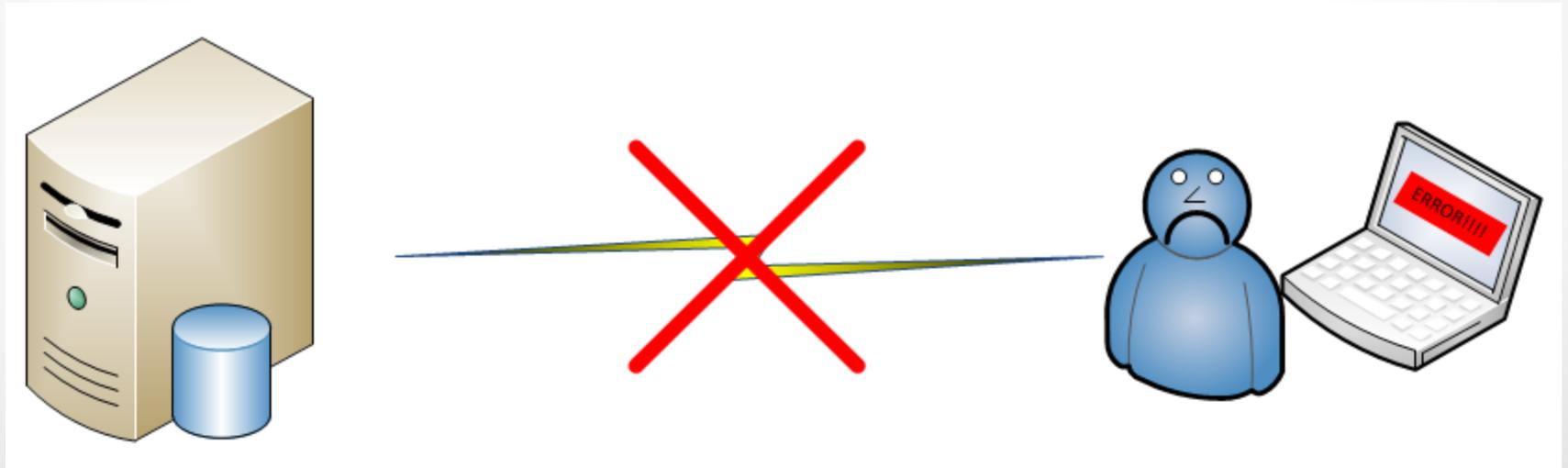
```
Task[] allTasks = tasks;
```

```
while (tasks.Length > 0)  
{  
    taskIndex = Task.WaitAny(tasks);  
    tasks = tasks.Where((t) => t != tasks[taskIndex]).ToArray();  
}
```

```
try  
{  
    Task.WaitAll(allTasks);  
}
```

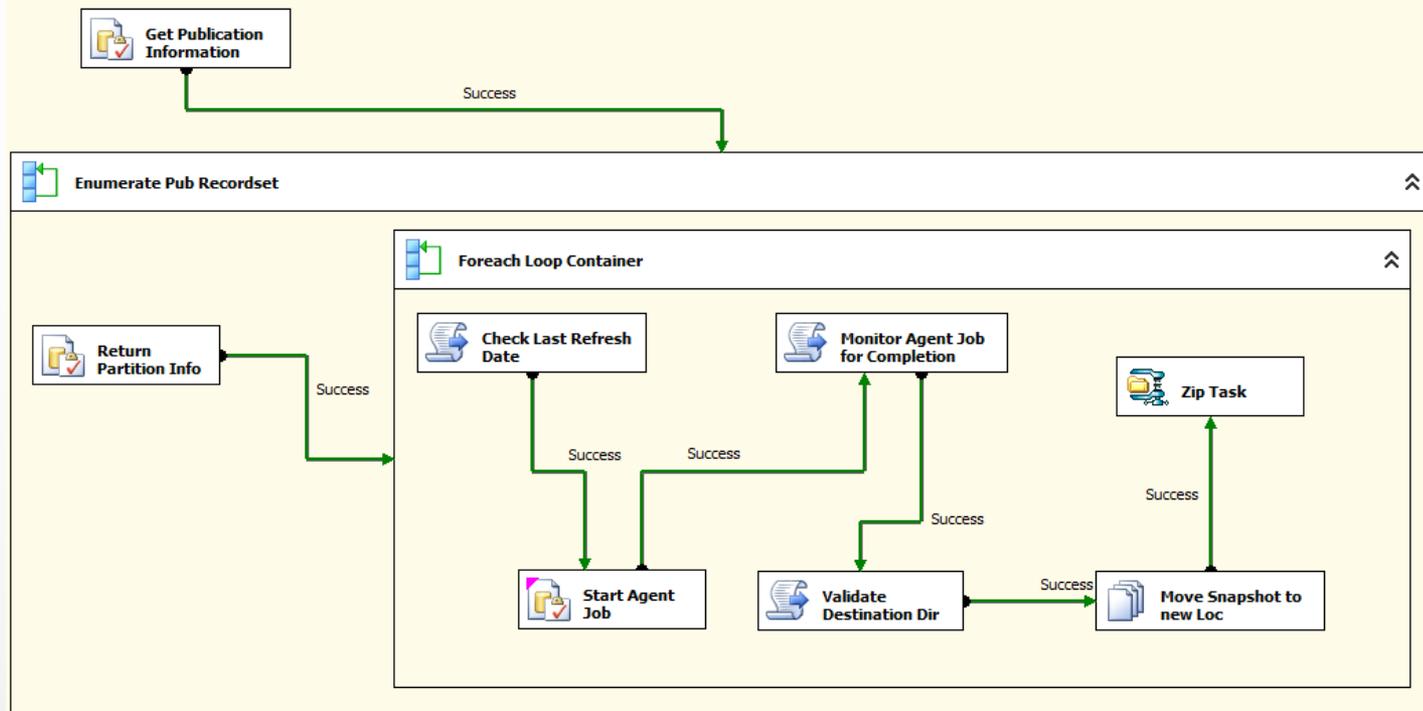
# Critical on Snapshots

- Everything starts with a snapshot and is saved with a snapshot
  - Can I apply in parallel?
  - Can I get at the snapshot?



# DBA Multiplier

- SSIS – Windows Services Management
  - Preparing snapshots ahead of time
    - Partition management



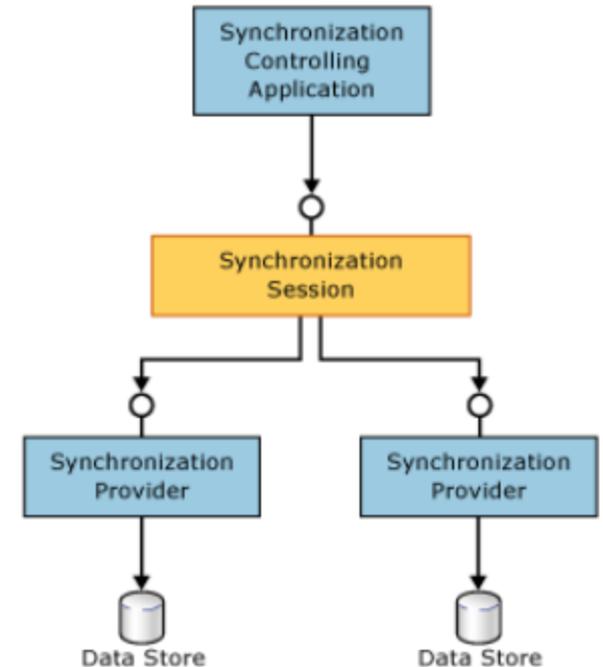
# Sync Framework

- Not so much different than Replication
- Power is placed in the developers hands
  - Oh boy!!!!
  - So what happens when things change?
  - Upgrades
  - Deployments
- Brief Overview
  - Triggers – Yes, like replication, it is all triggers
  - Doubling up with replication – infinite loop of updates
  - Enhancements are coming and speed will get better

# Sync Framework

- This “IMO” is the answer to...
  - iPhone
  - Droid
  - Tablets
  - Cloud
- Microsoft Samples
  - Link in the last slide
  - iPhone and Droid examples

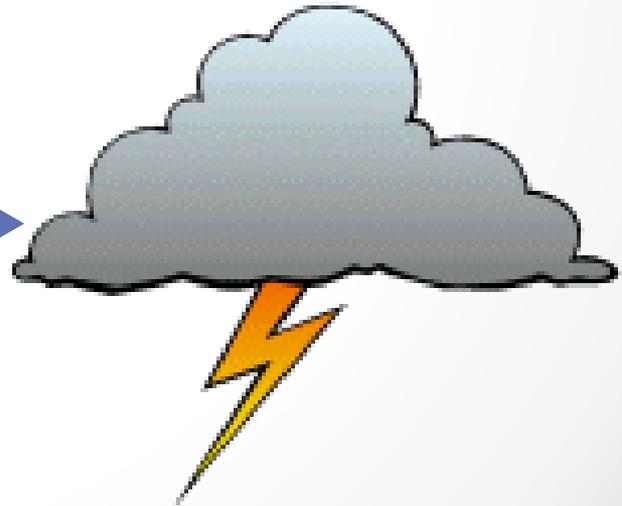
## Architecture Overview



# “The Cloud”

- Realistically how many companies can go there?
- The Cloud can do this though
  - Final word – analyze the entire situation before jumping the latest buzz word

Don't let it turn into  
this kind of Cloud



# Questions

WAKE UP!!!!