

Spil Games: outgrowing an internet startup

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Overview

1. Who is Spil Games?
2. How to professionalize?
3. Spil Storage Platform
4. Questions?



Who are we?

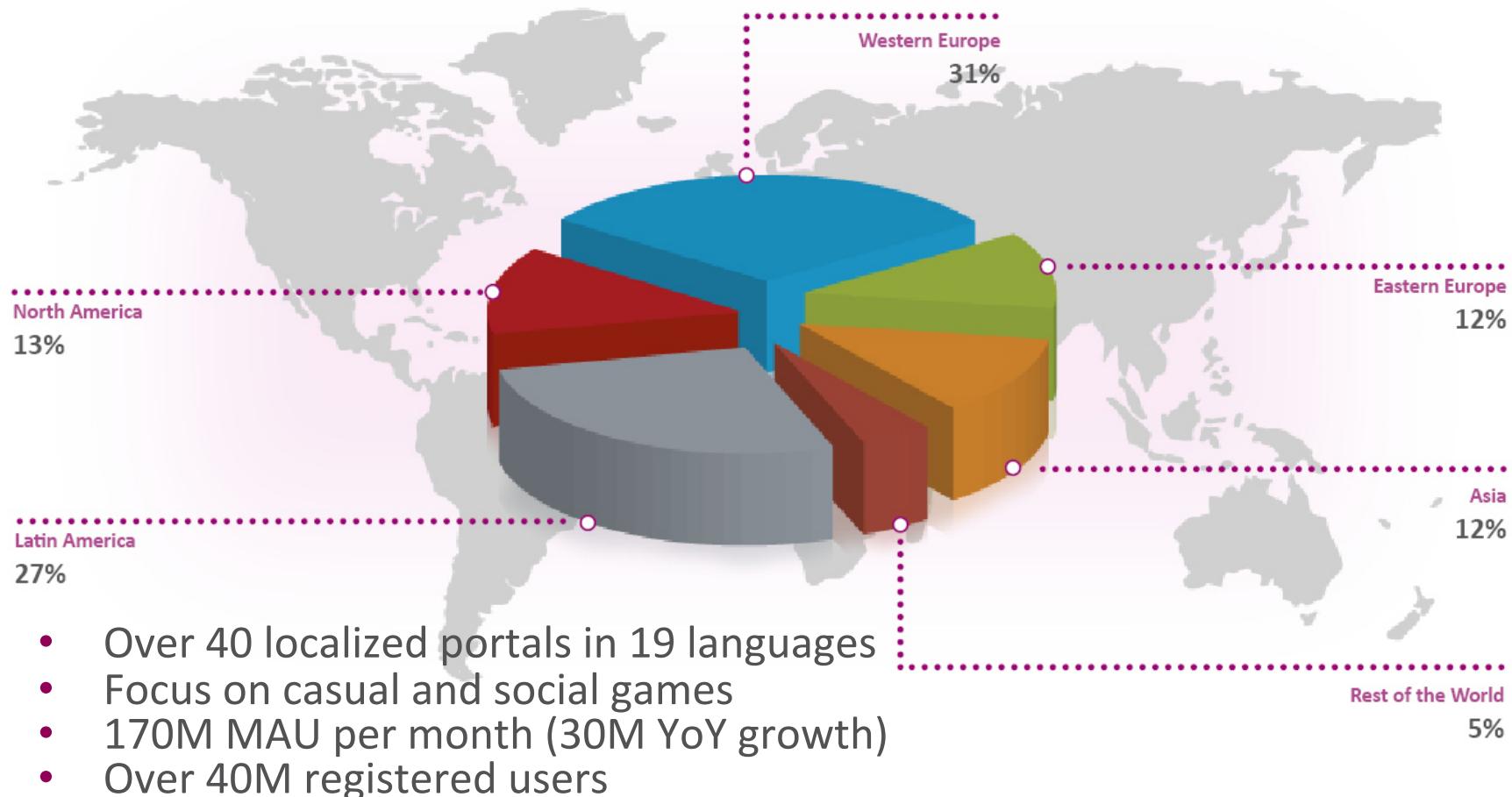
Who is Spil Games?

Facts

- Company founded in 2001
- 350+ employees world wide
- 170M unique visitors per month
- 100K unique visitors per month on spilgames.com

Geographic Reach

170 Million Monthly Active Users(*)



Source: (*) Google Analytics, December 2011

Brands

Girls, Teens and Family

GirlsGoGames.com

This website features a pink-themed interface with a navigation bar at the top. It includes sections for 'New Girls Games', 'Popular Games', 'Game Awards', 'Award Games', 'Creation Games', 'Highscore Games', 'Adventure Games', 'Animal Games', 'Celebrity Games', 'Doll Games', 'Dress Up Games', 'Fun Games', 'Make Up Games', 'Makeover Games', 'Memory Games', 'Music Games', 'Painting Games', 'Princess Games', 'Puzzles Games', 'Simulation Games', 'Card & Board Games', 'Cooking Games', and 'Room Makeover'. The main content area displays various game thumbnails and descriptions.

Game.co.in

This website has a blue-themed interface. It features a 'Create an avatar' section at the top. Below it are sections for 'CHECK THESE OUT!', 'NEWEST GAMES', and 'RECENTLY PLAYED'. The main content area is divided into several categories: RACING GAMES (332), SPORTS GAMES (248), SKILL GAMES (192), ACTION GAMES, ADVENTURE GAMES, BOARD & CARD GAMES, PUZZLE GAMES (154), and MULTPLAYER GAMES (51). Each category lists specific games with their names and counts.

Gamesgames.com

This website has a red-themed interface. It features a 'Create an avatar' section at the top. Below it are sections for 'HOME', 'ACTION', 'ADVENTURE', 'BOARD & CARD', 'GIRLS', and 'MULTIPLAYER'. The main content area is divided into several categories: NEW GAMES, POPULAR GAMES, AWARD GAMES, and more. Each category lists specific games with their names and counts.



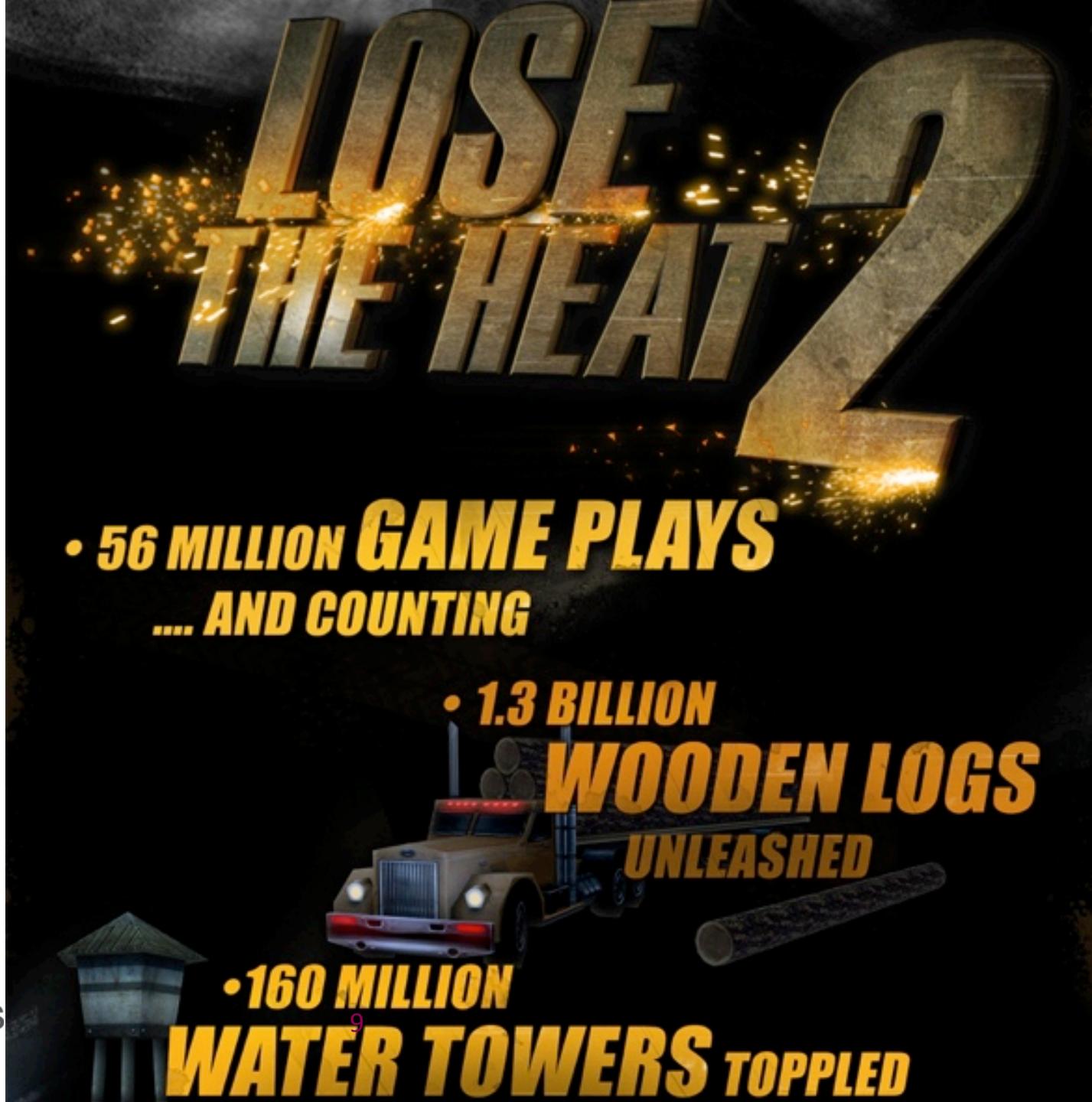
Games



Games



Games



Games



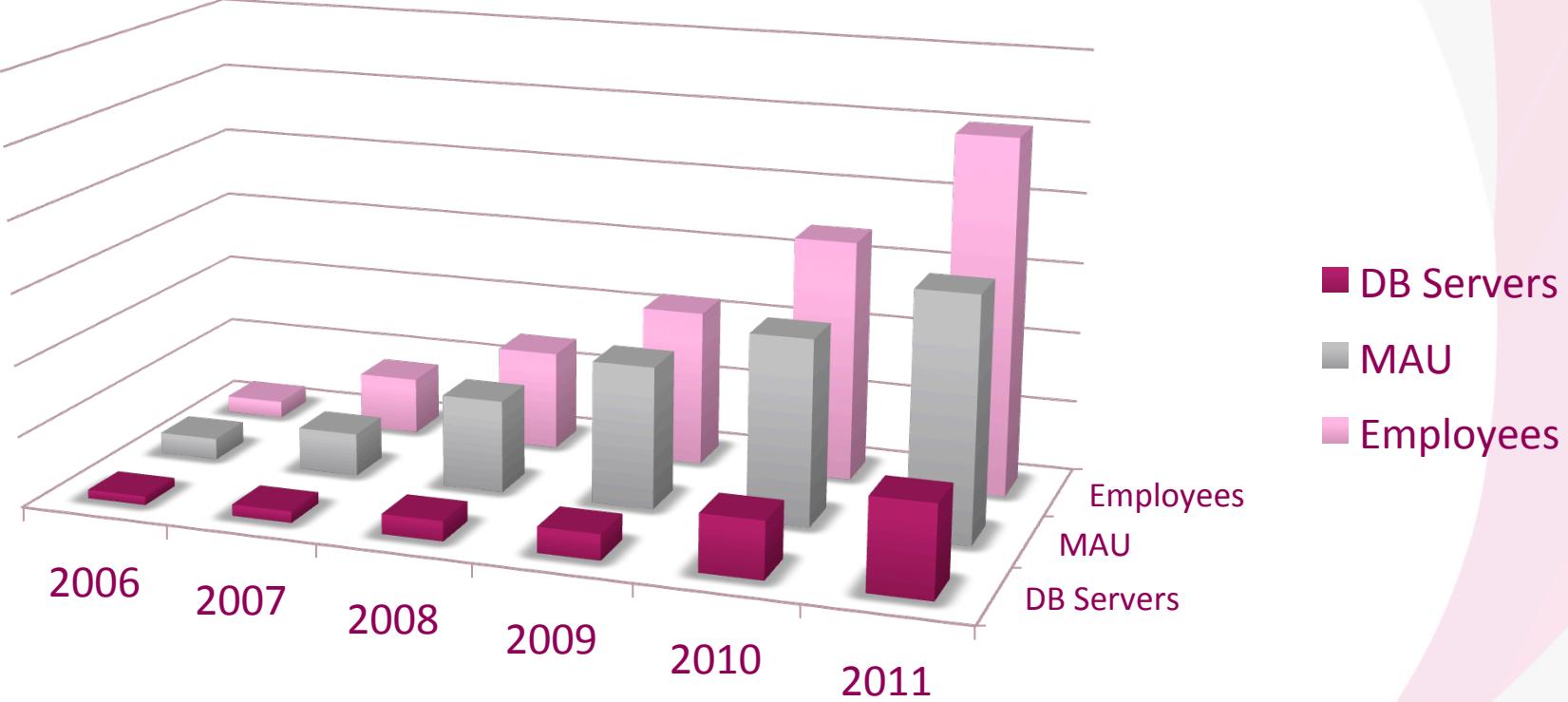
Games



Games

- Inhouse game studios
- Partnerships with Social Gaming studios
- Over 1500 licensed games

Spil Games is growing fast!





Database Engineering

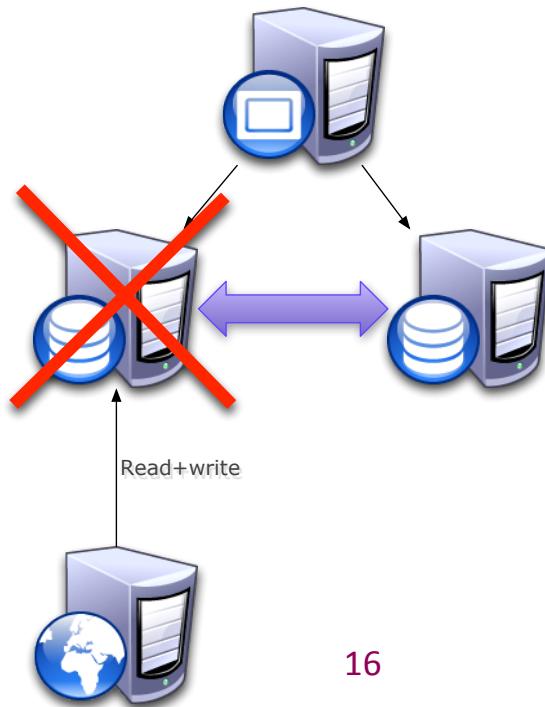
How to professionalize your
department

Startup

- Databases maintained by Systems Engineering
- No focus on performance, structure or backups
- Looking only one or two weeks into the future

Lessons

- Multiple migrations to new hardware
- Ping-pong on Master-Master setups
- Lack of insight into performance issues

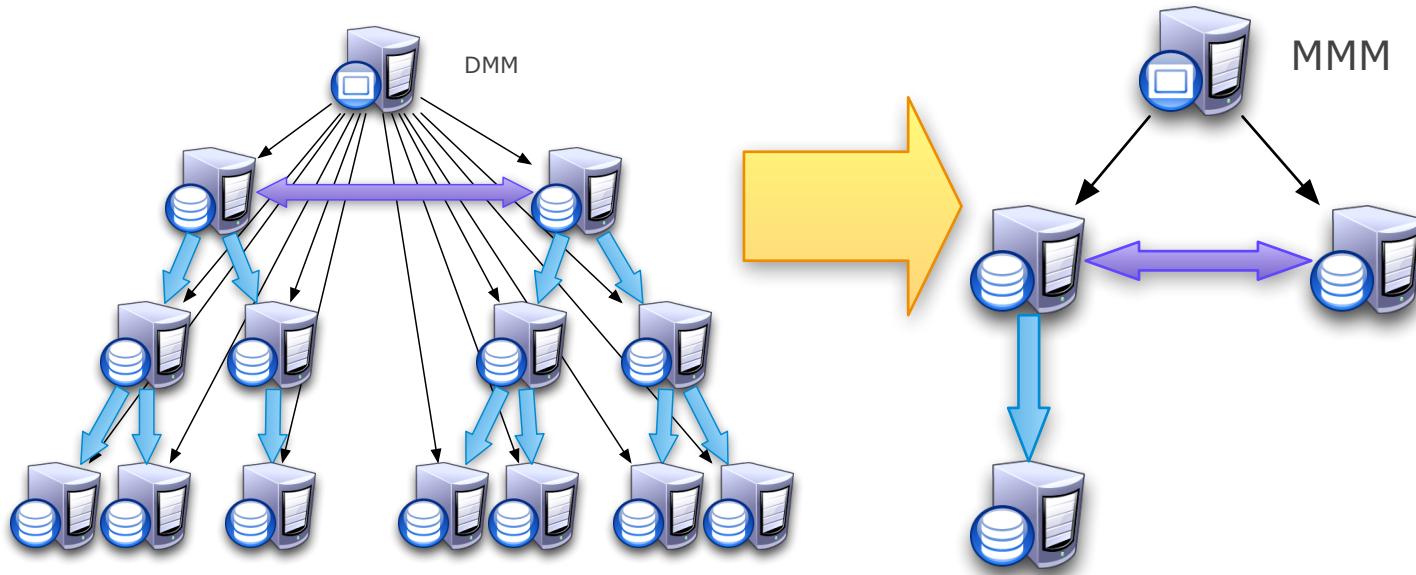


Professionalize

- Plan ahead up to three months
- Improve database platform
 - Reduce number of repetitive tasks
 - Write them down step by step (wiki)
 - Automate where possible
 - Improve monitoring
 - A single monitoring system is not enough!
 - Forecast growth
 - Week / Month / Year
 - Look back and evaluate!
- Extend department

LDAP isn't suitable for the web

- Scaling the LDAP platform
- LDAP replaced by MySQL based solution (with help from Percona)



Cloning

- LVM snapshot method
 - took 4 hours on average with manual intervention
- Innobackupex + netcat + tar + script = quick cloning
 - Takes about 1 hour per 100GB
 - Foolproof
 - Can be run on active masters (if necessary)

Improve monitoring

- Different monitoring systems give different insights
 - Different angles/metrics/purposes
 - Early problem detection
 - Signal abnormal use which could cause outage

Growing pains

- Uneven growth:
 - Active master handling all write requests
 - Vertical scaling
- Write only
 - More writes than reads
- SOA problems
 - Connection spawning
 - Open file descriptors

Outgrowing our startup phase

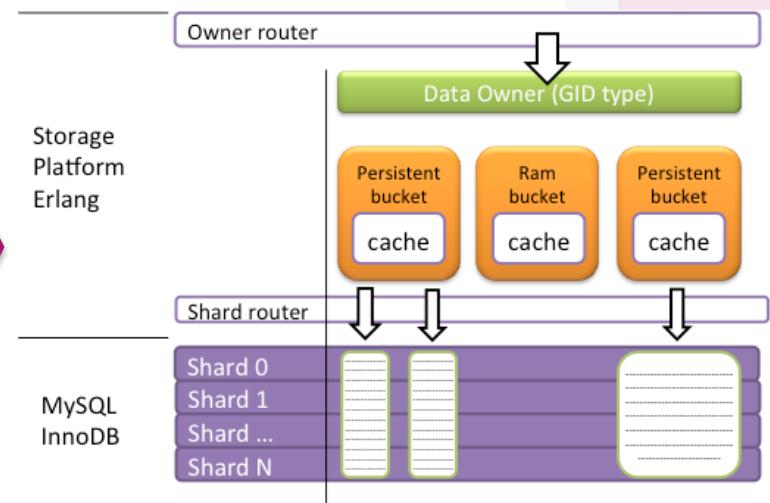
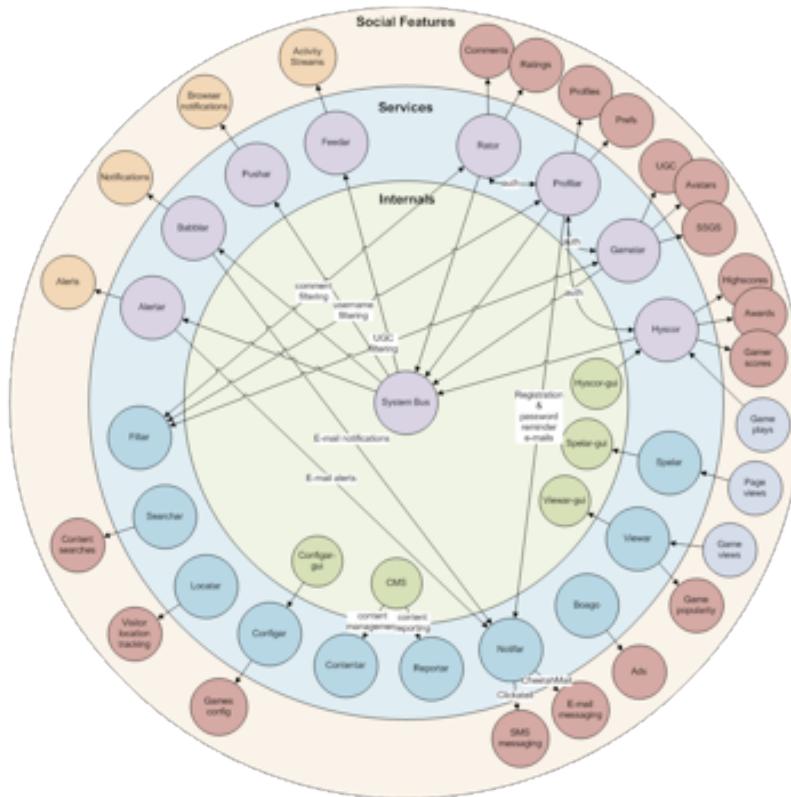
- Anticipate more than one year in advance
- Acknowledge shortcomings/problems, look for solutions or alternatives
 - Don't commit to one single solution!
 - Be flexible!
- Plan for capacity per instance, not for growth alone!
- Start thinking globally!



Spil Storage Platform

Sharding is inevitable

What is this exciting project about?



Functional sharding

- Natural growth
- Grown out of necessity for more functionality
- Adding functionality means more interaction
- Separation of database function
 - Profiles
 - Highscores
 - Comments
 - User Generated Content
 - etc

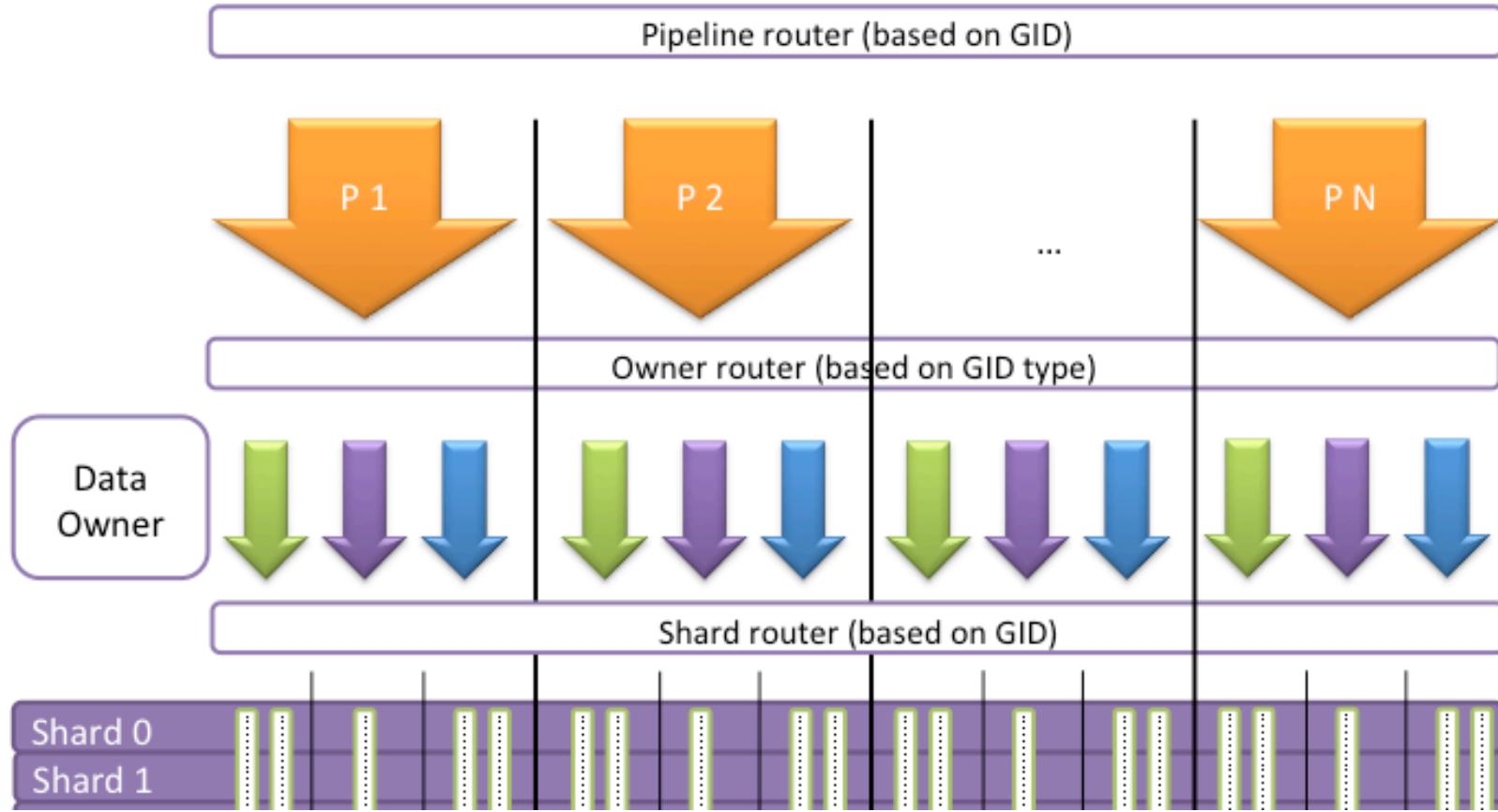
Advantages

- KISS
- Problem isolation

Disadvantages

- Uneven growth
- Difference in query patterns
- No data consistency
- No clear ownership of data
- Capacity planning on total number of reads/writes
- Horizontal scaling is difficult

Spil Storage Platform



Bucket model

- What is the bucket model?
 - It is an abstraction layer between the database and the datamodel
 - Each record has one unique owner attribute (GID)
 - The GID (Global IDentifier) identifies different data types
 - Different buckets per function
 - Attributes contain record data
 - Attributes do not have to correspond to schema

Advantages

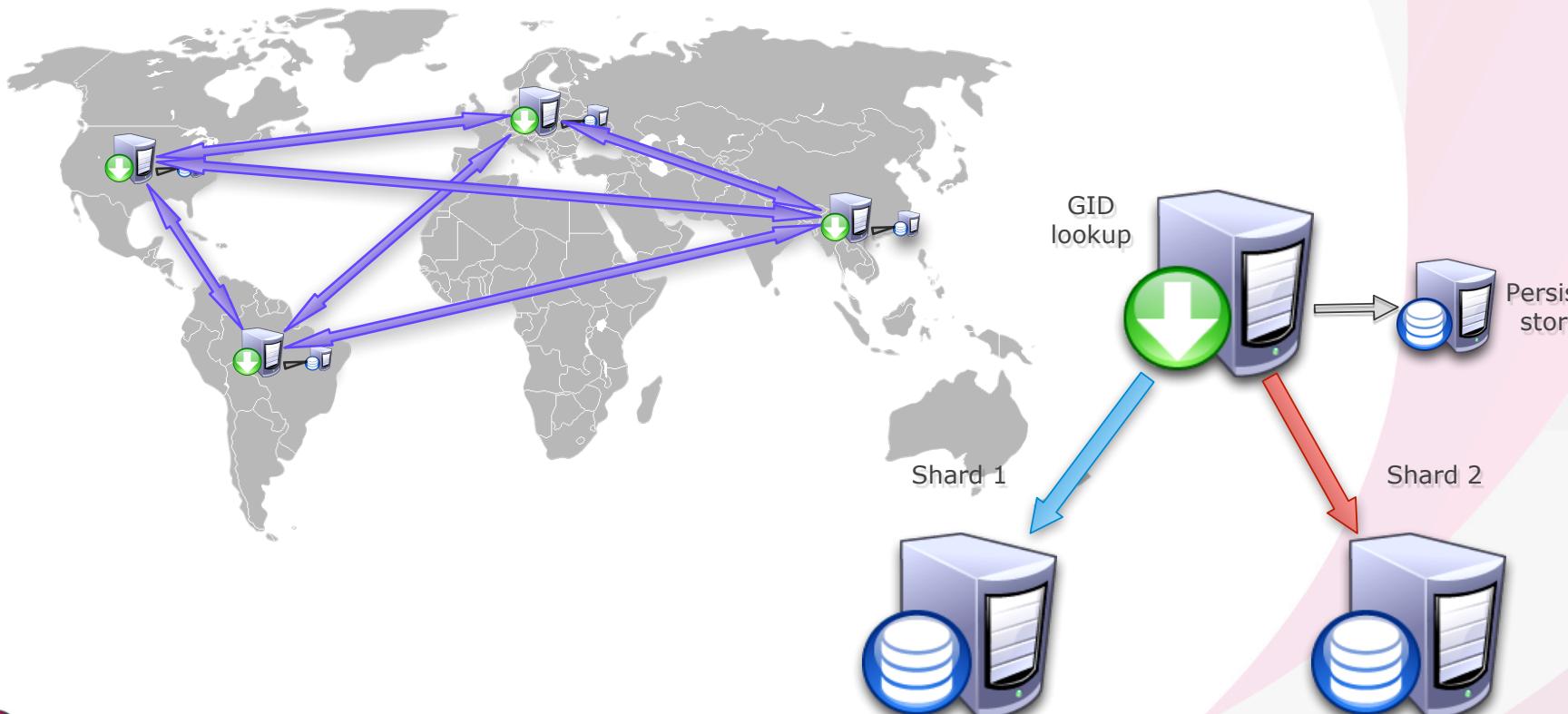
- Flexibility
 - Database backend independent
 - Seamless schema changes and upgrades
 - Sharded on both functional and GID level
- Even distribution of queries possible
 - Capacity planning on number and type of entities
- Asynchronous writes possible
- Transparent data migration

Disadvantages

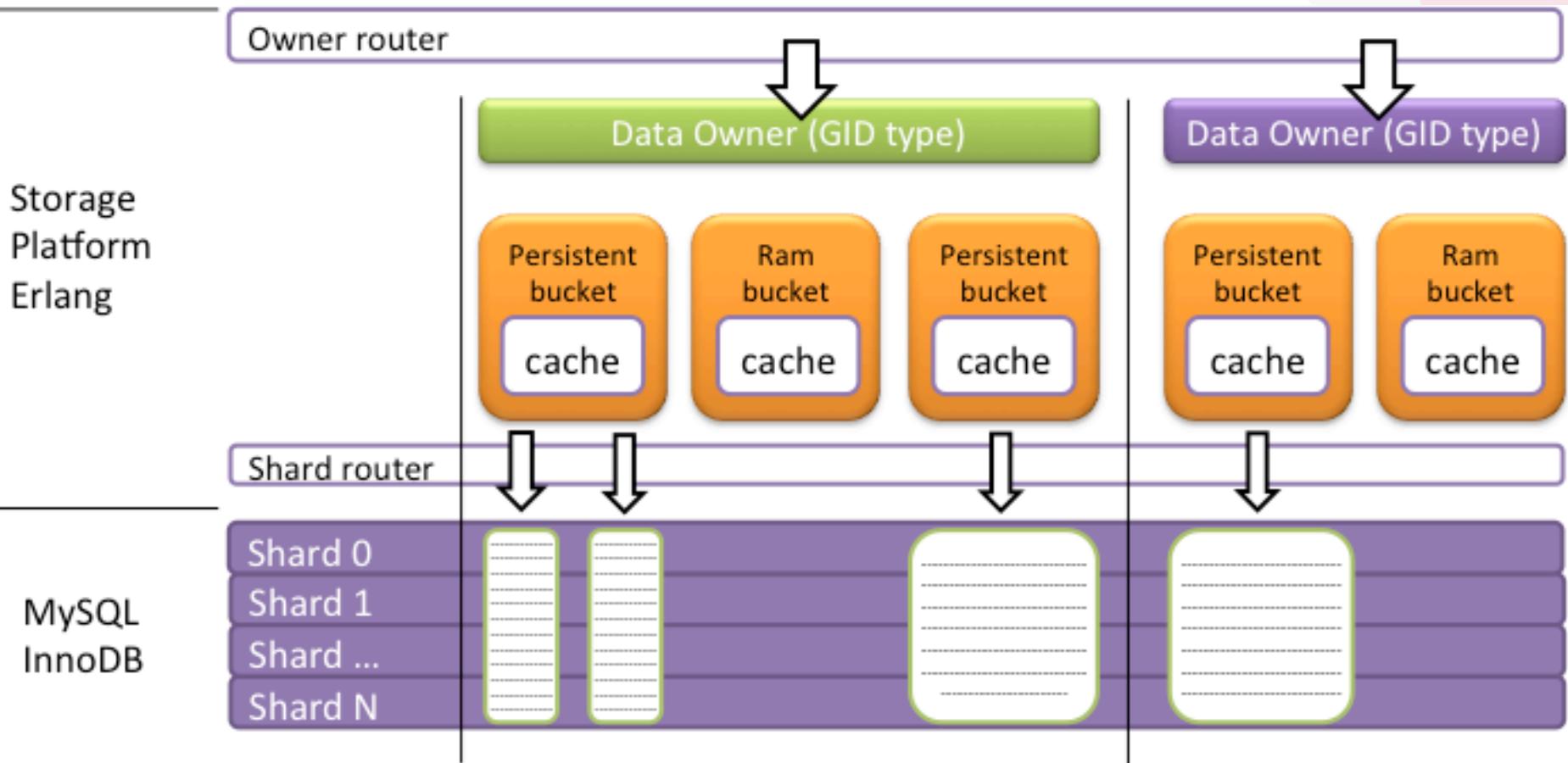
- Harder to find data
 - At least two lookups needed!
 - Datawarehousing needs a different approach

How do GIDs work?

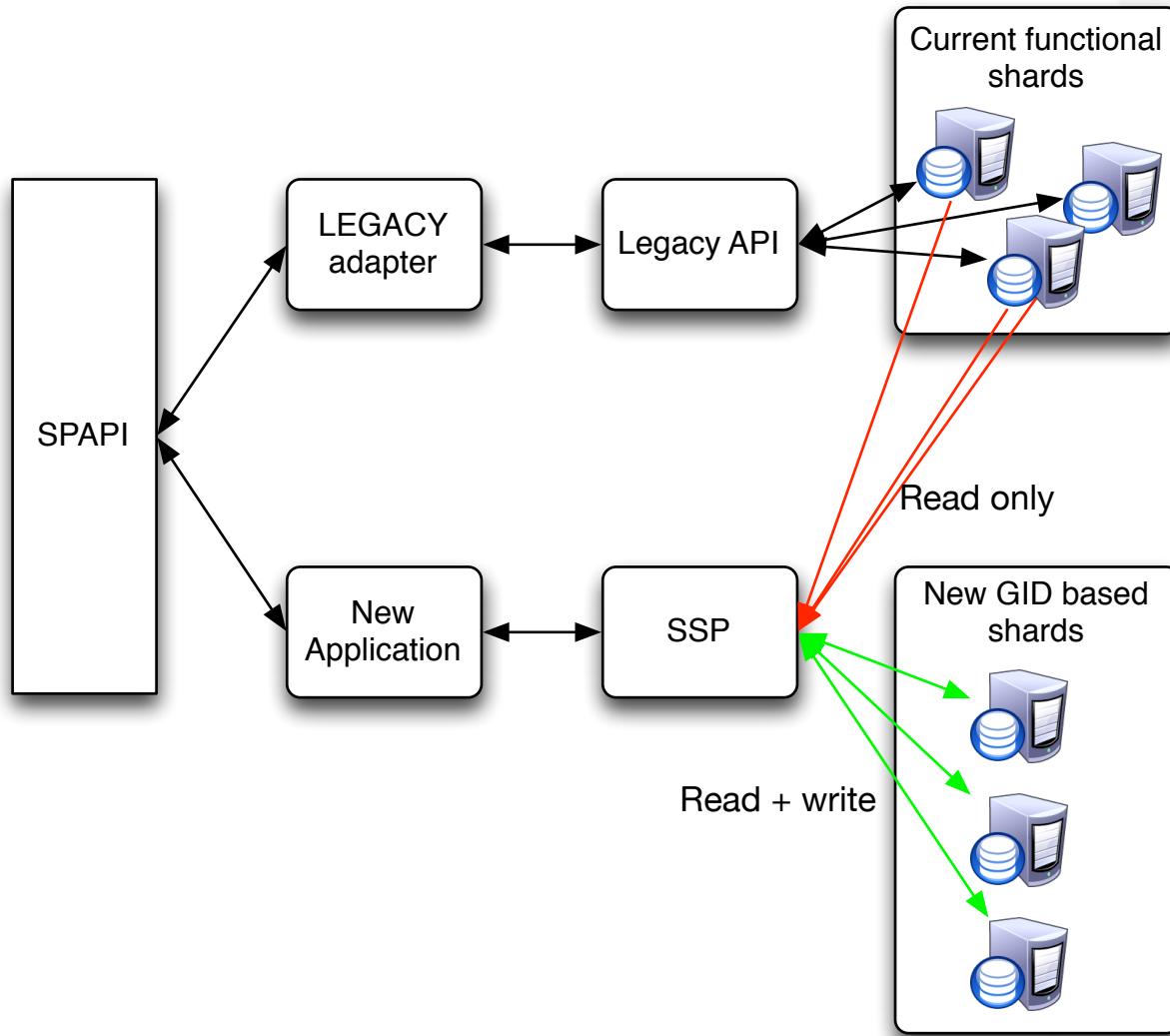
- Globally sharded on GID
- (local) GID Lookup



Pipeline flow

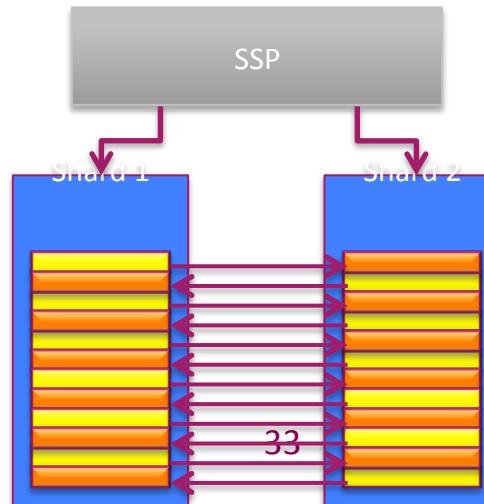


Bucket mapping and migration



Master-Master Sharding

- Each cluster of two masters will contain two shards
 - Data is written interleaved
 - HA for both shards
 - No warmup needed
- Both masters active and “warmed up”
- Slave added for backups and Datawarehouse



How are we implementing this SSP?

- Erlang cluster with many workers
- Every GID has its own worker process
- (Inter)cluster communication
- (Near) linear scalability

Advantages

- Erlang node caching
- Multiple backend connectors
 - MySQL library
 - Handlersockets
 - Any other connectors if needed
- Connection pooling



Disadvantages

- NOT SEXY? (<http://spil.com/notsexy>)

Do YOU want to be sexy?





Questions?

Thank you!

