Daniel Rezny, Tomi Vanek

Accenture

Digital in Space & Time

Caching Patterns and Strategies

October 17, 2014

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To ask questions

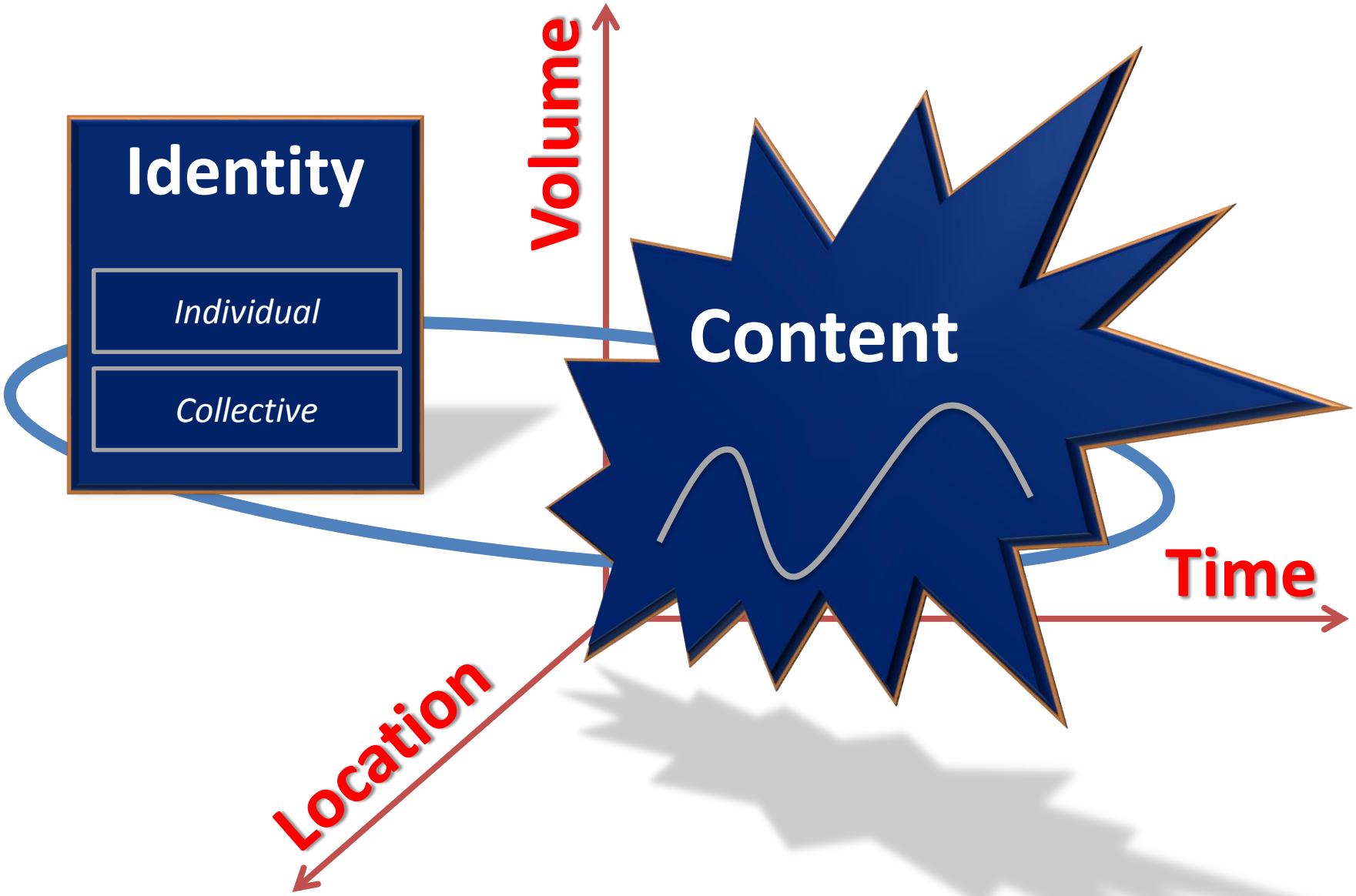
www.sli.do/openslava

or just raise your hand!

Data

Everything what is DIGITAL is DATA.

Data = **Identity & Content**



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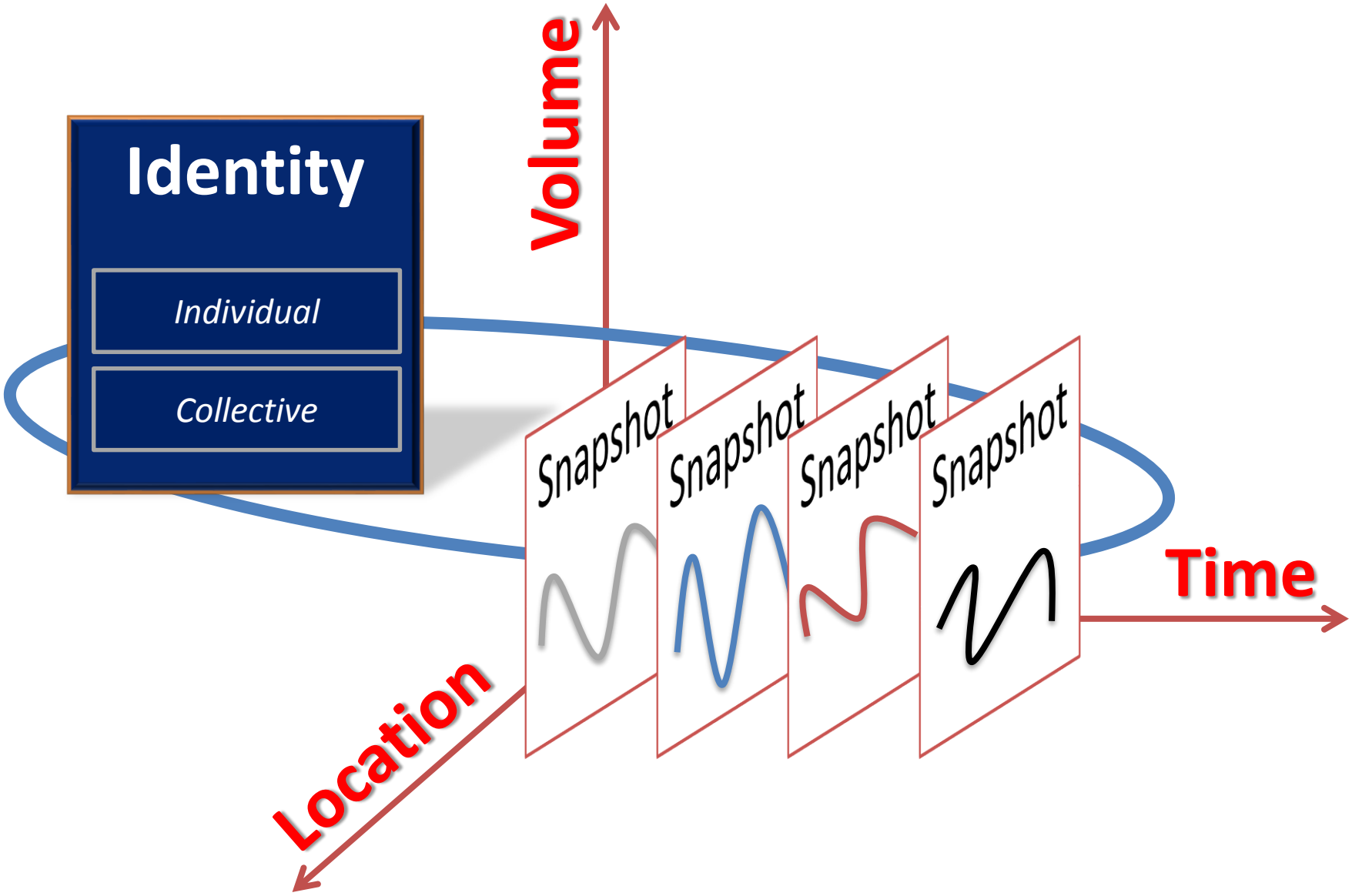
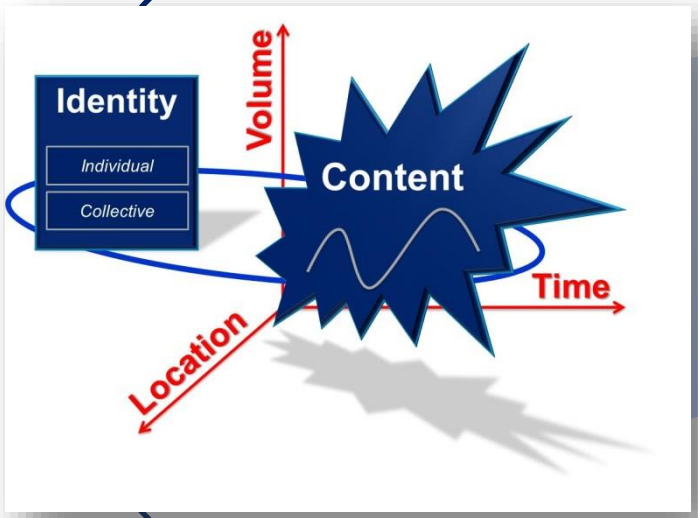
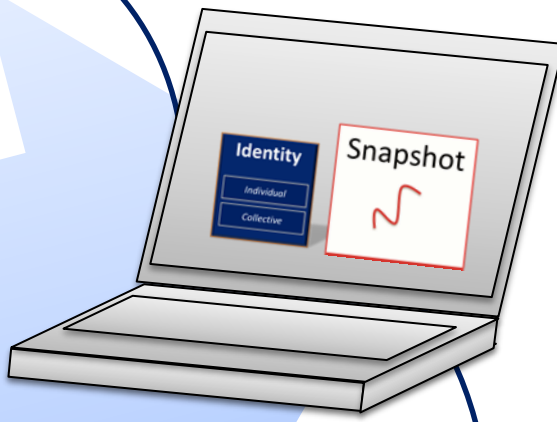




Accuracy

Latency

Scale



Good scalability

Transparency

Easy to maintain

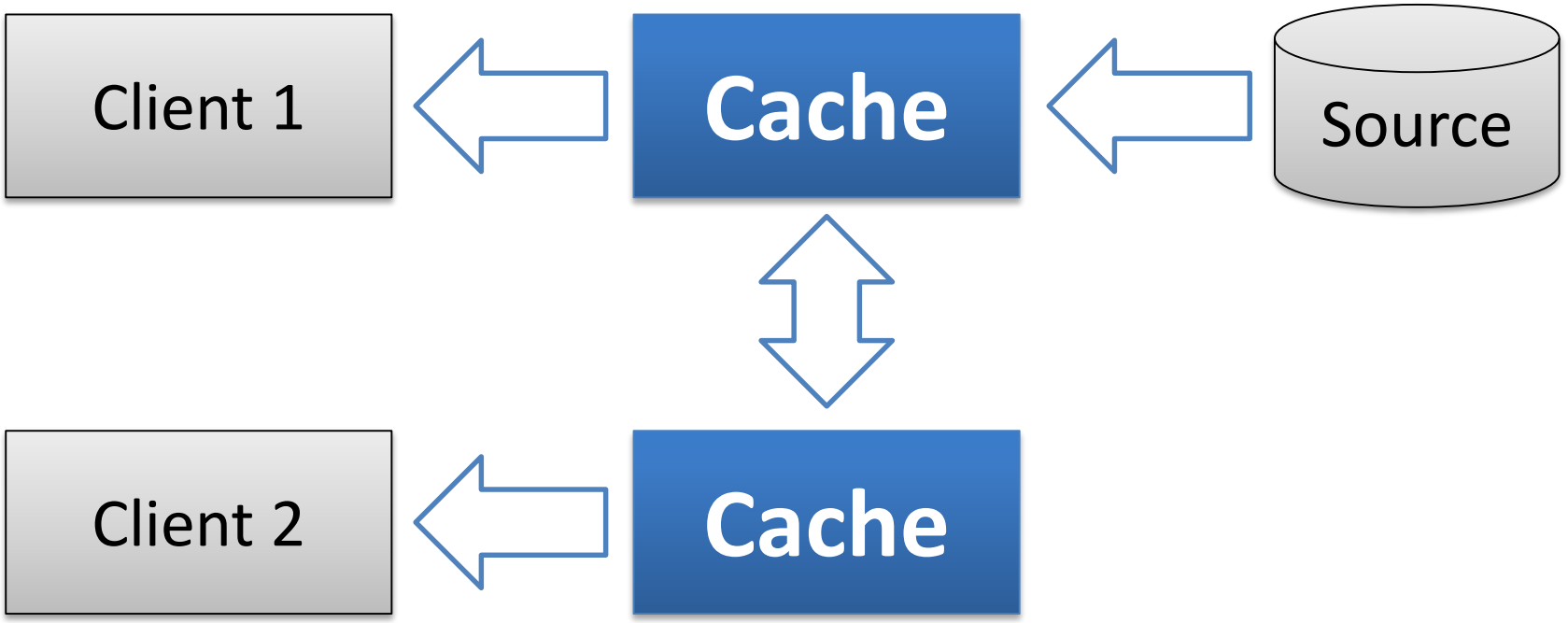
Reduced load on source

Fast recovery after failover

Cache Patterns

Read Through Cache

Read Through



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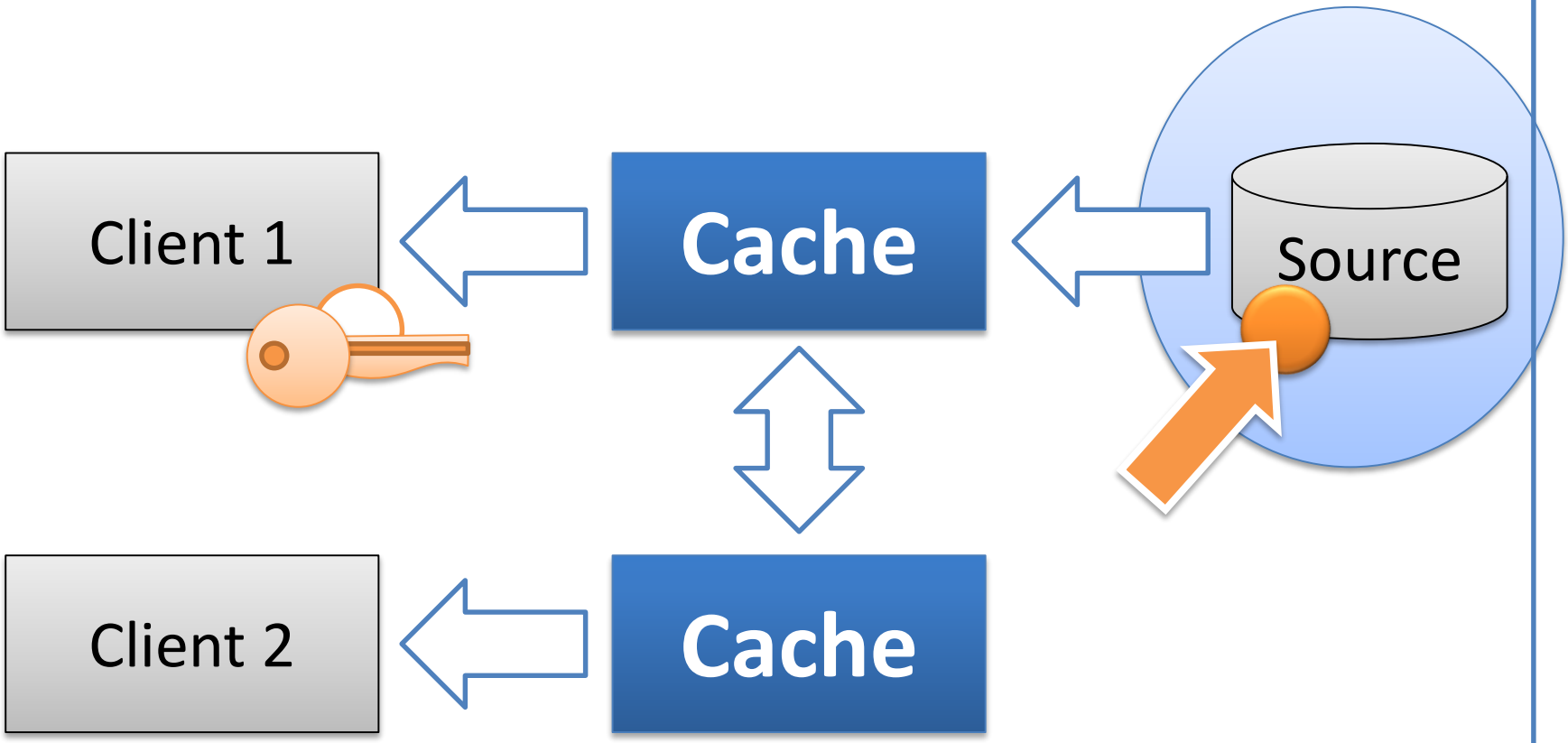

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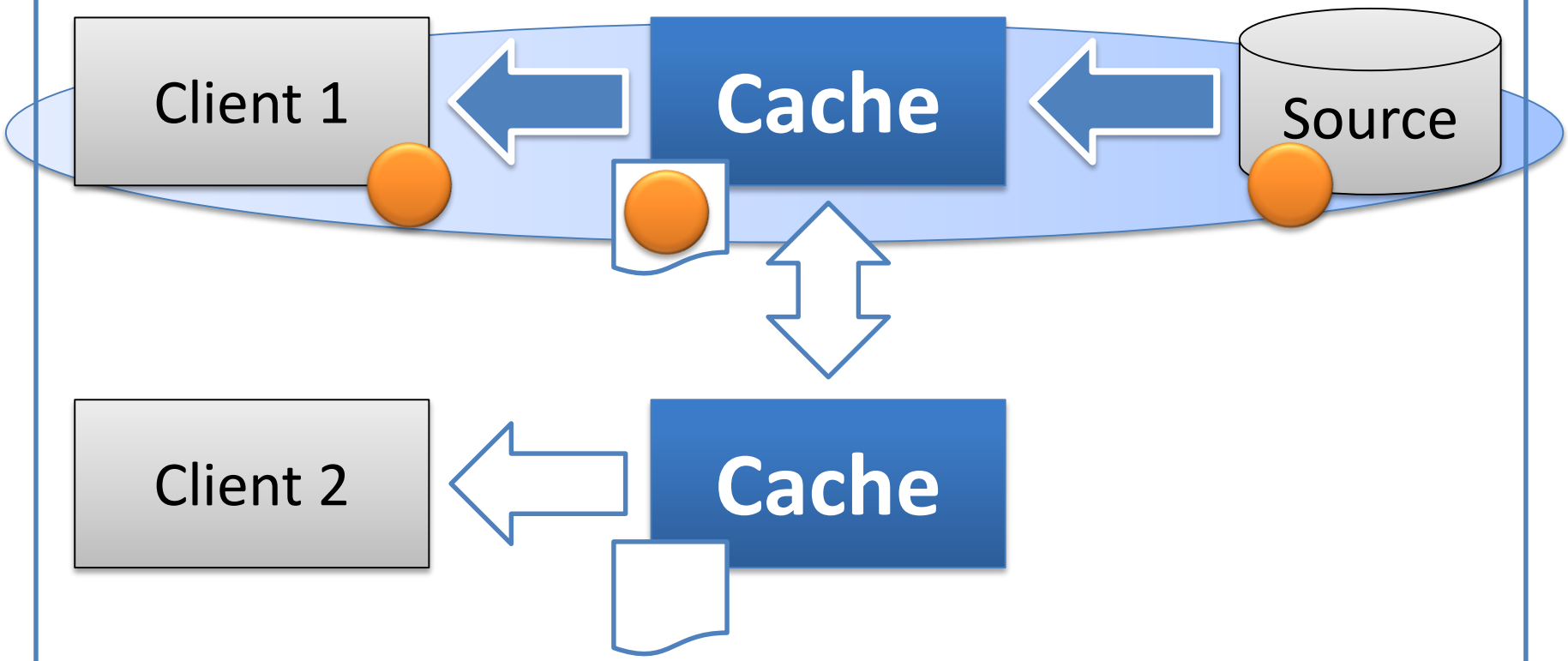

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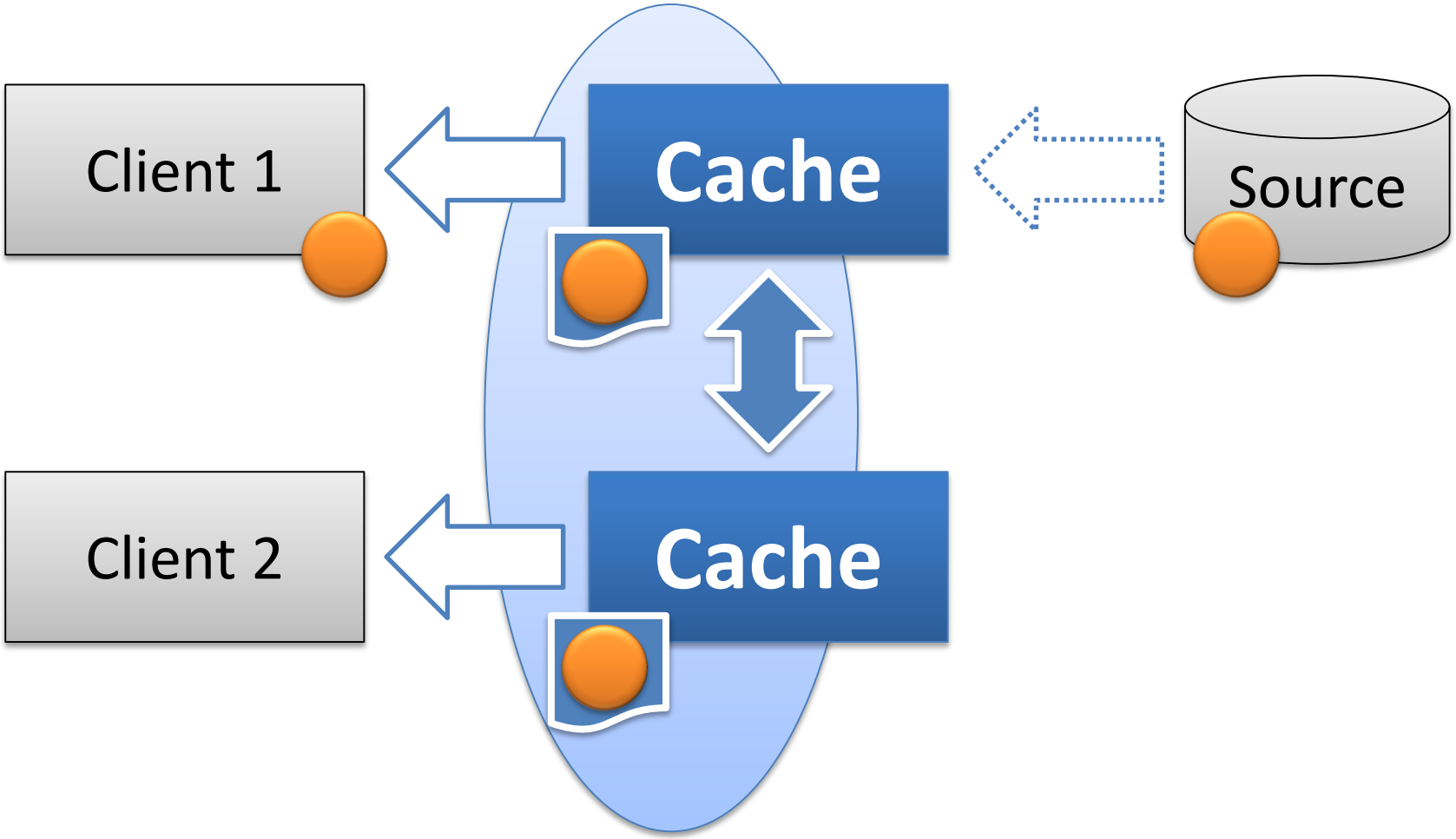

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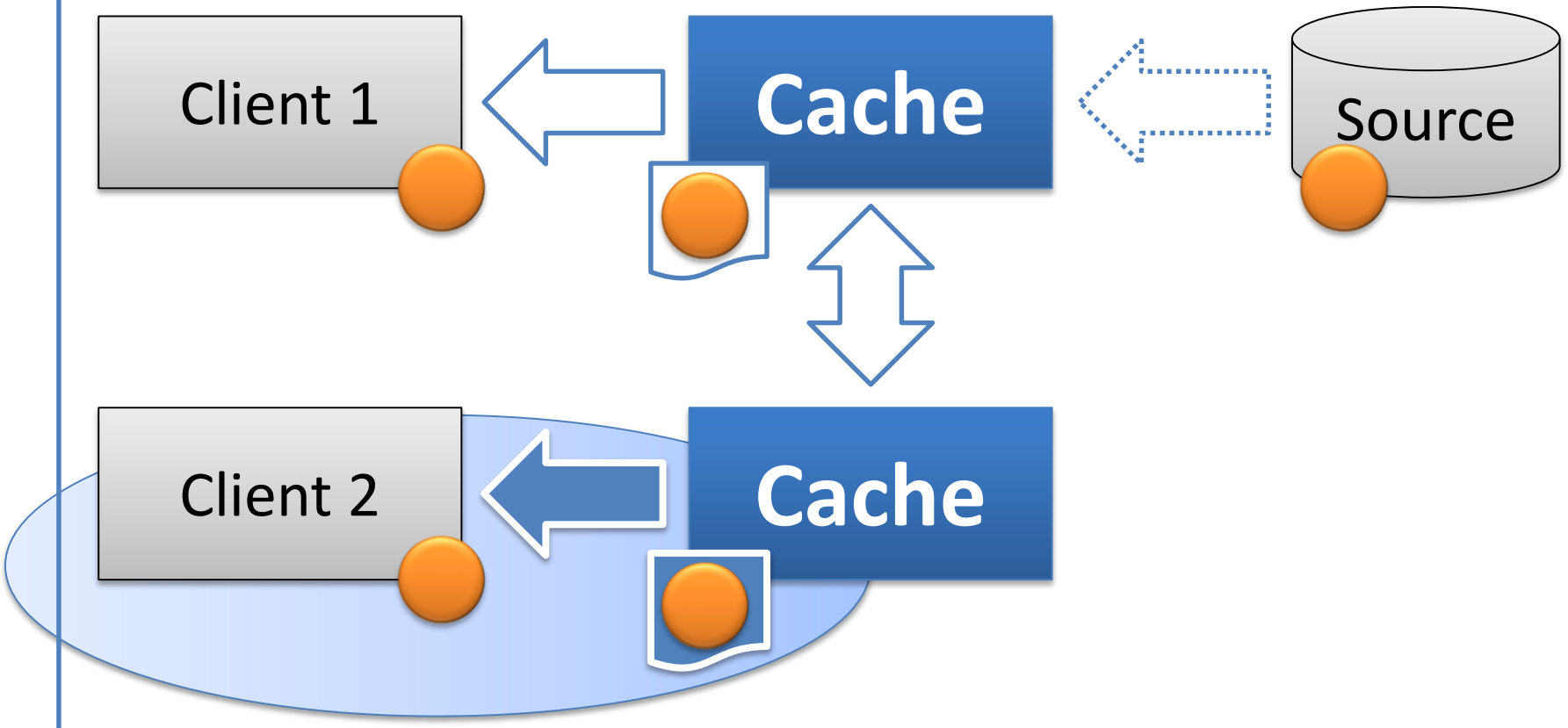

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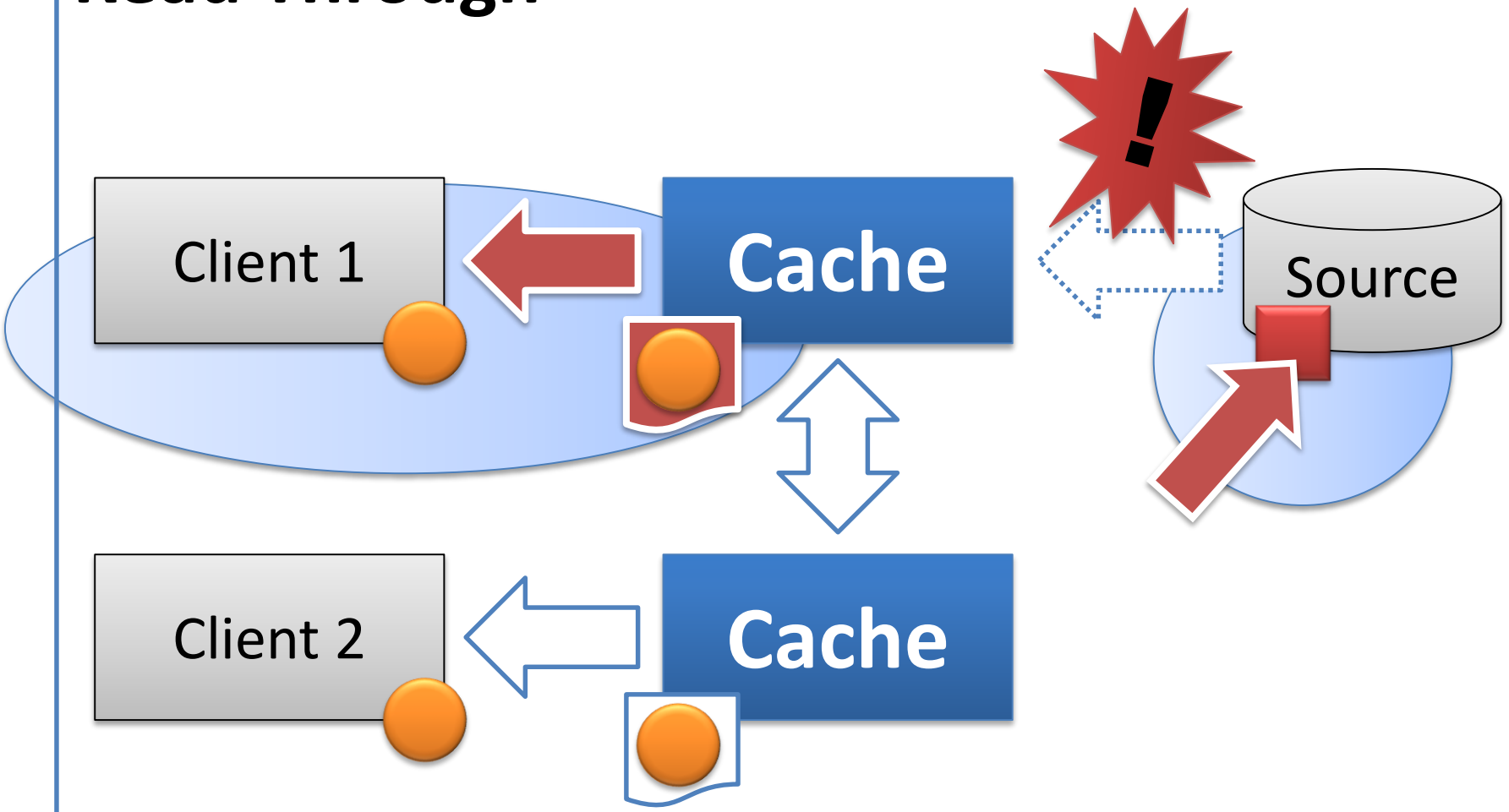


- Simple, transparent
- Scalable
- Faster response time by repeating requests
- Decreases load to data source

- Read only
- Only for repeating requests
- For data with rare changes
- Requests for unique data hit data source

Read Through usage examples

Content Delivery Network (CDN)

HTTP reverse proxy

Browser proxy

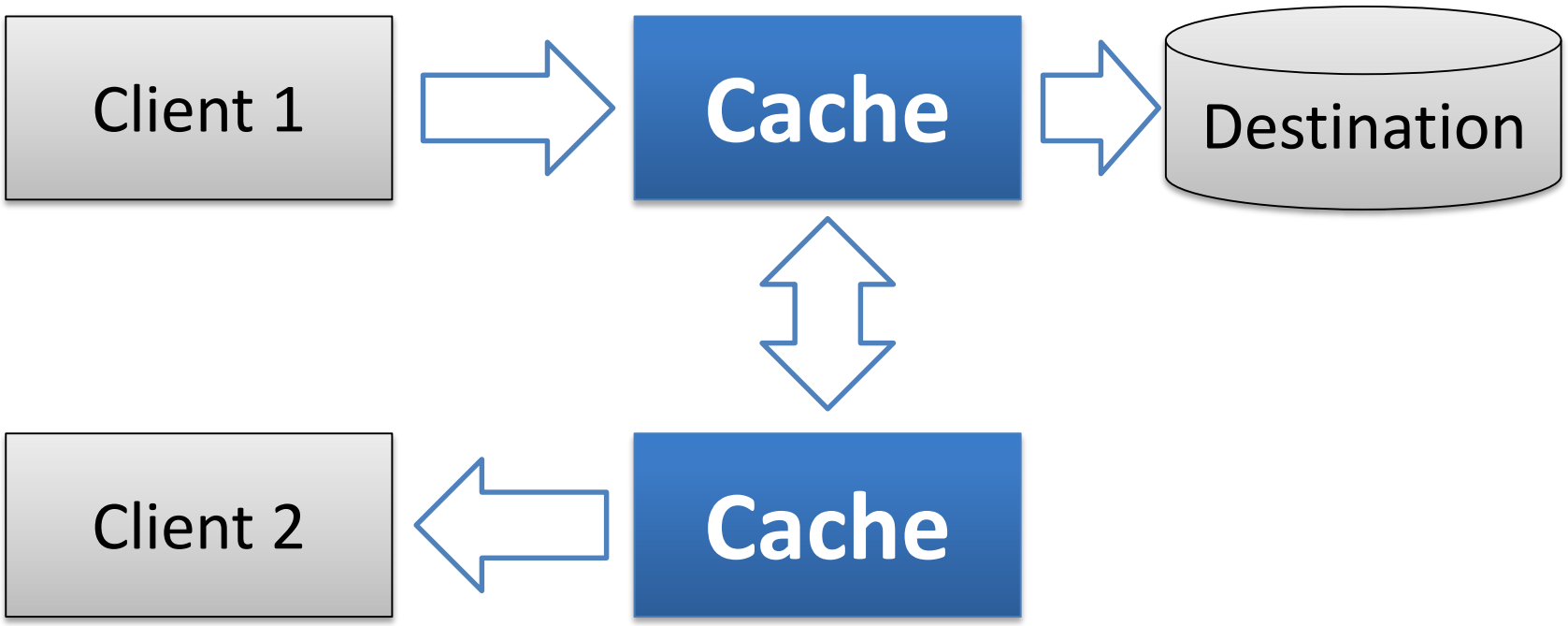
API management tools

Reusable data closer to consumption

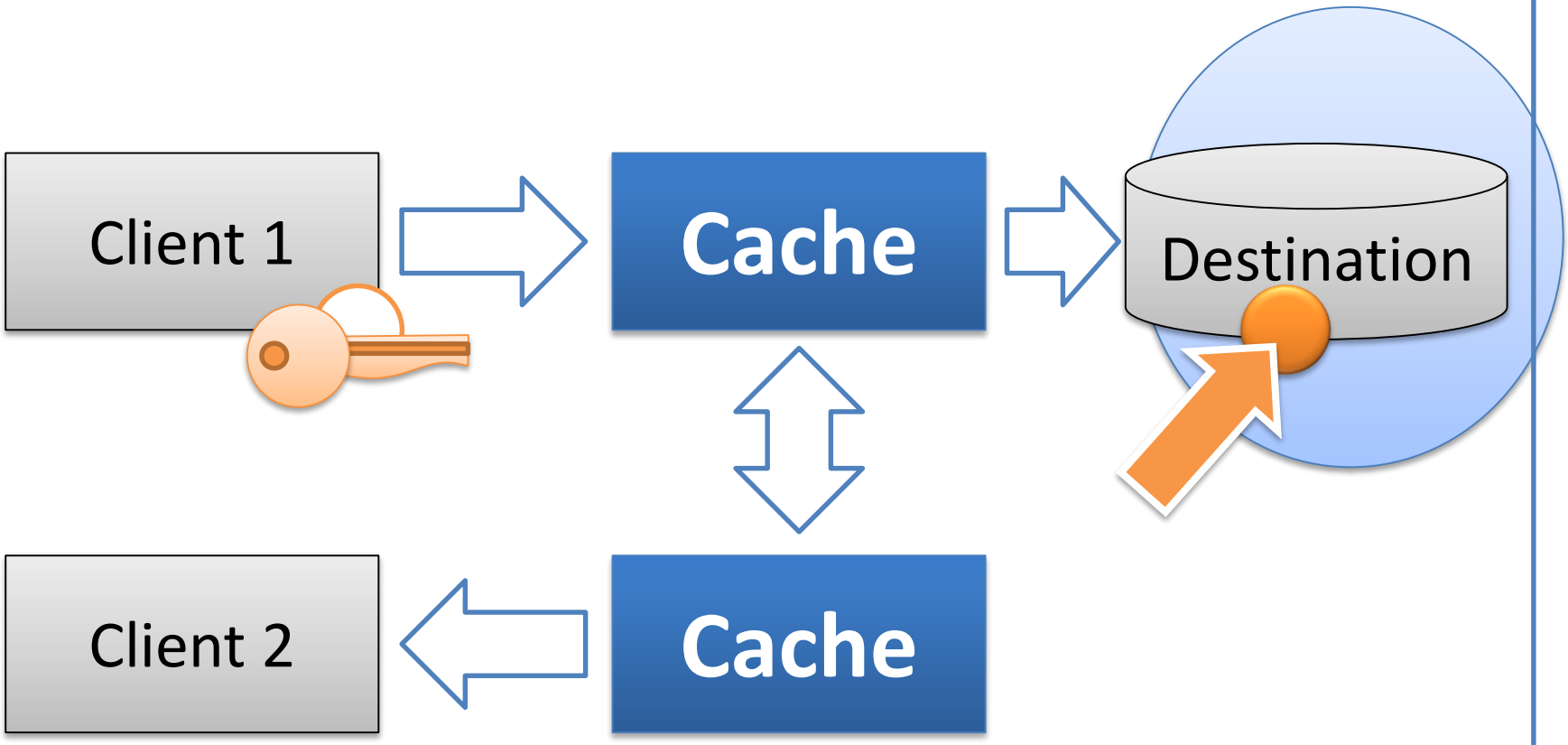
Cache Patterns

Write Through / Write behind

Write Through / Write behind



Write Through / Write behind



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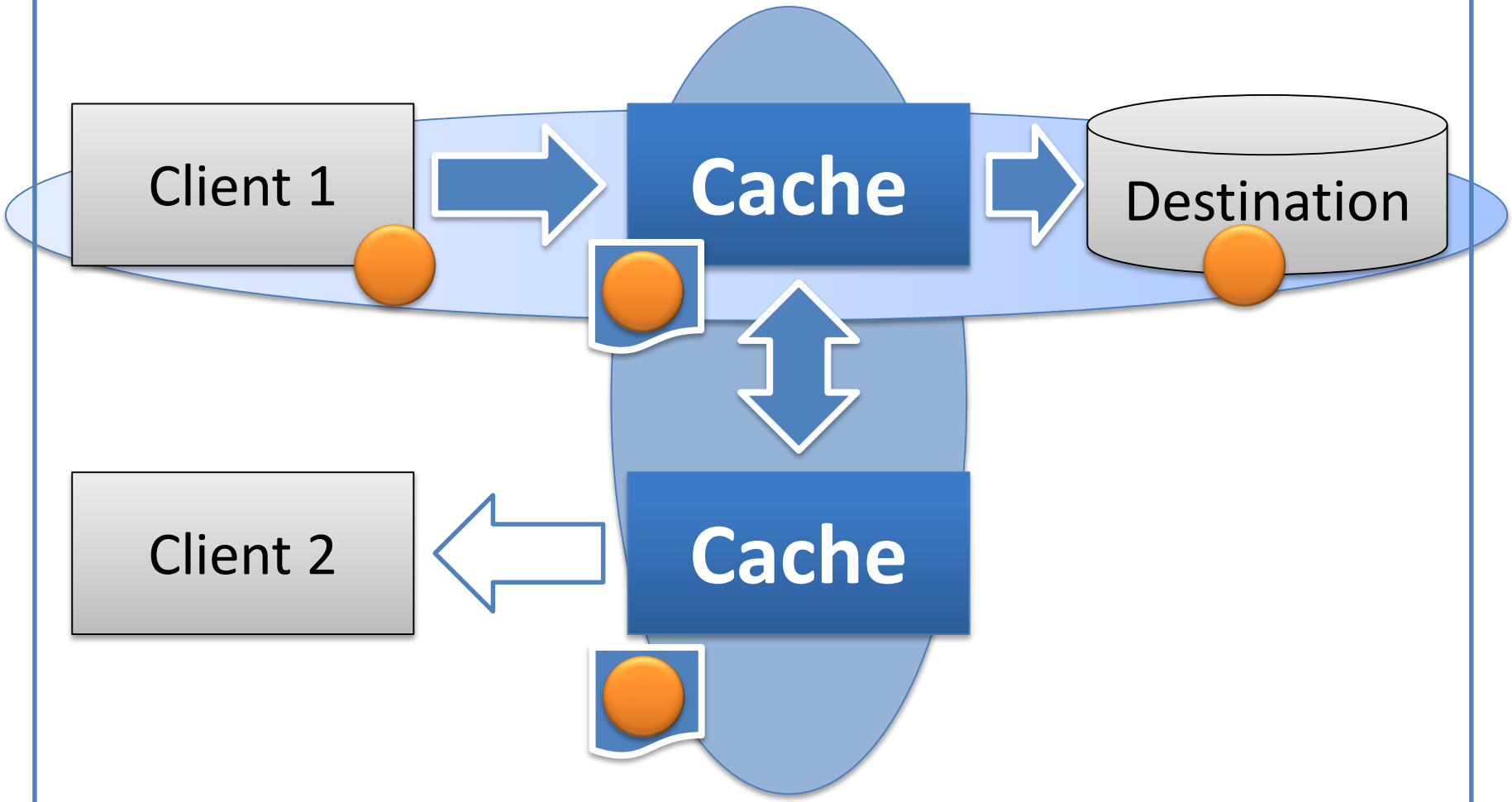
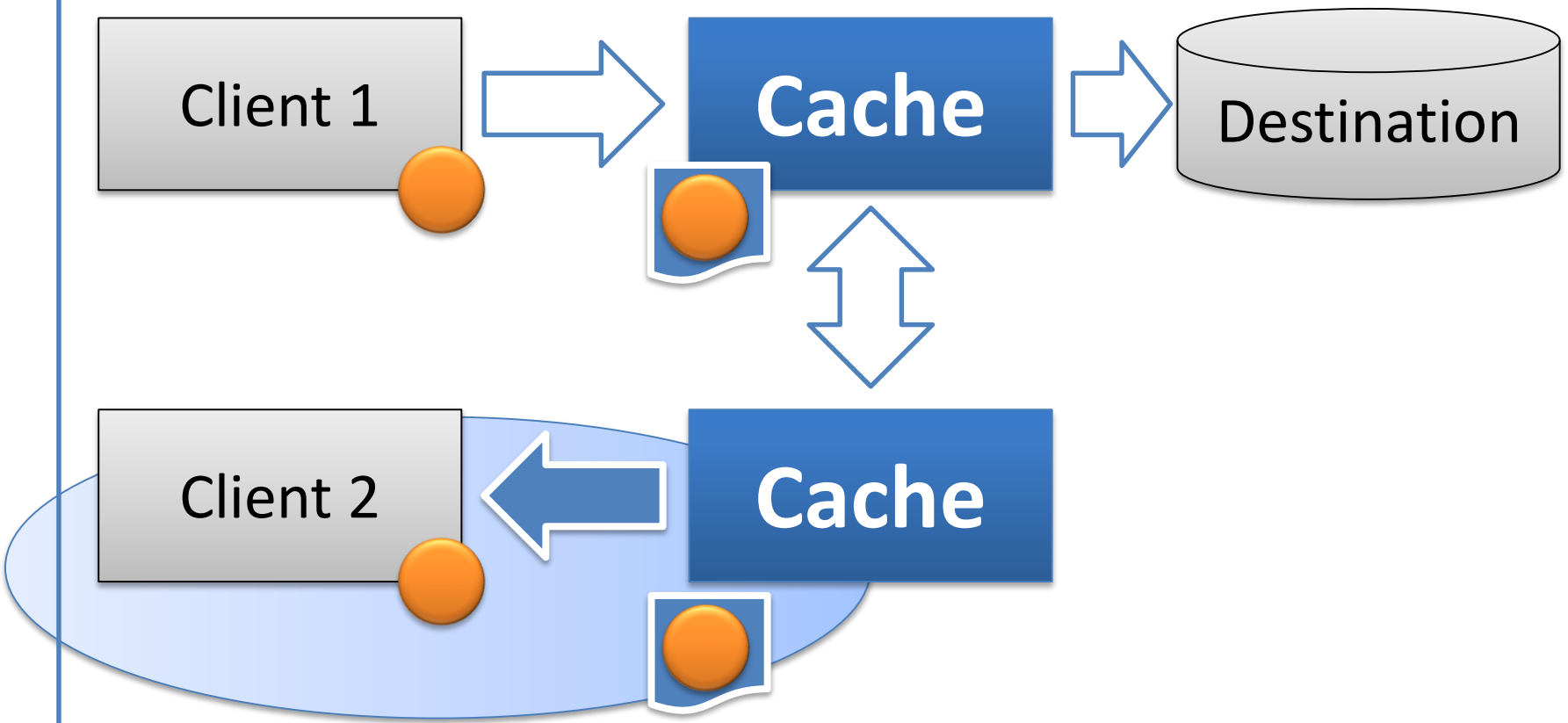


Write Through / Write behind



- Transparently hide destination systems
- The only application's source of data
- Limit amount of requests to the source
- Avoid cache misses
- Database unknown for application
- Split of responsibilities

- Does not improve writes speed
- Possible data inconsistences
- Cache transaction finish before database' starts

Write Through usage examples

Additional application layer

API management tools

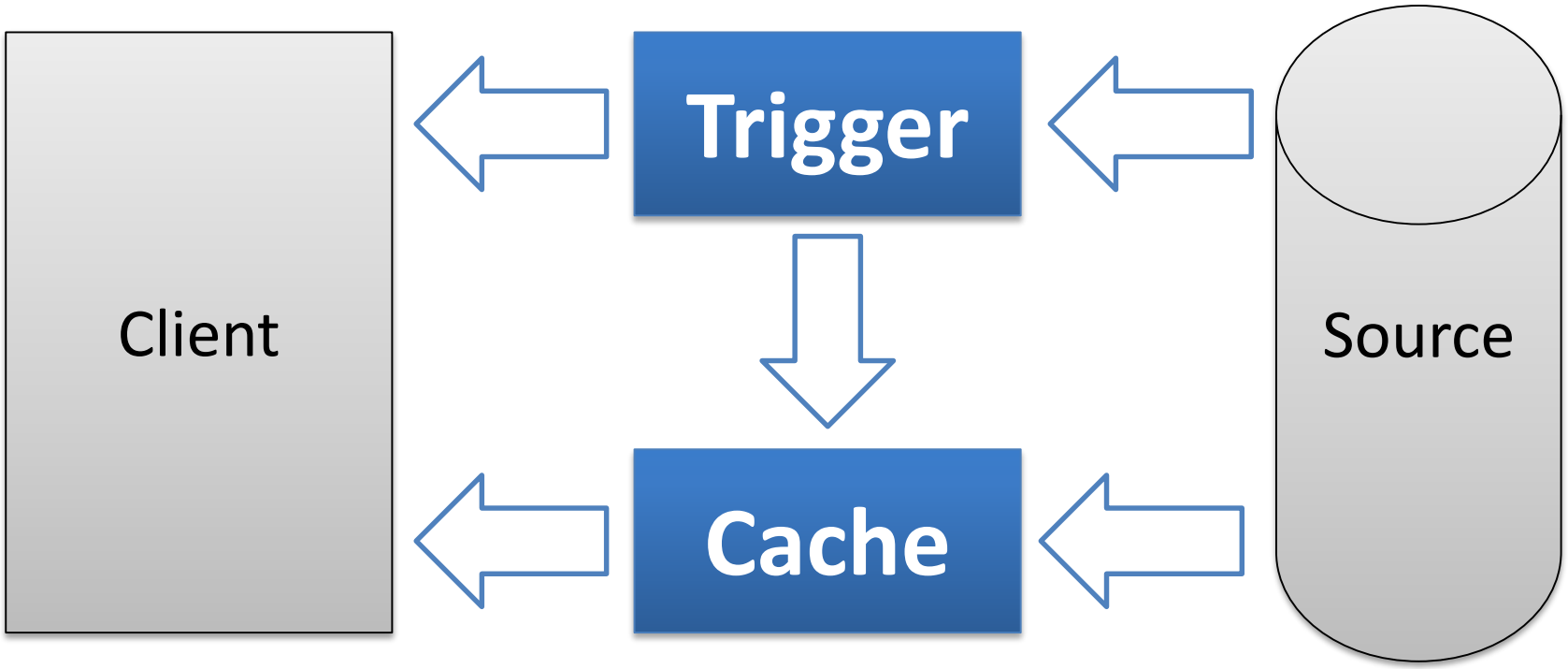
Content delivery network

Lot of writes and reads

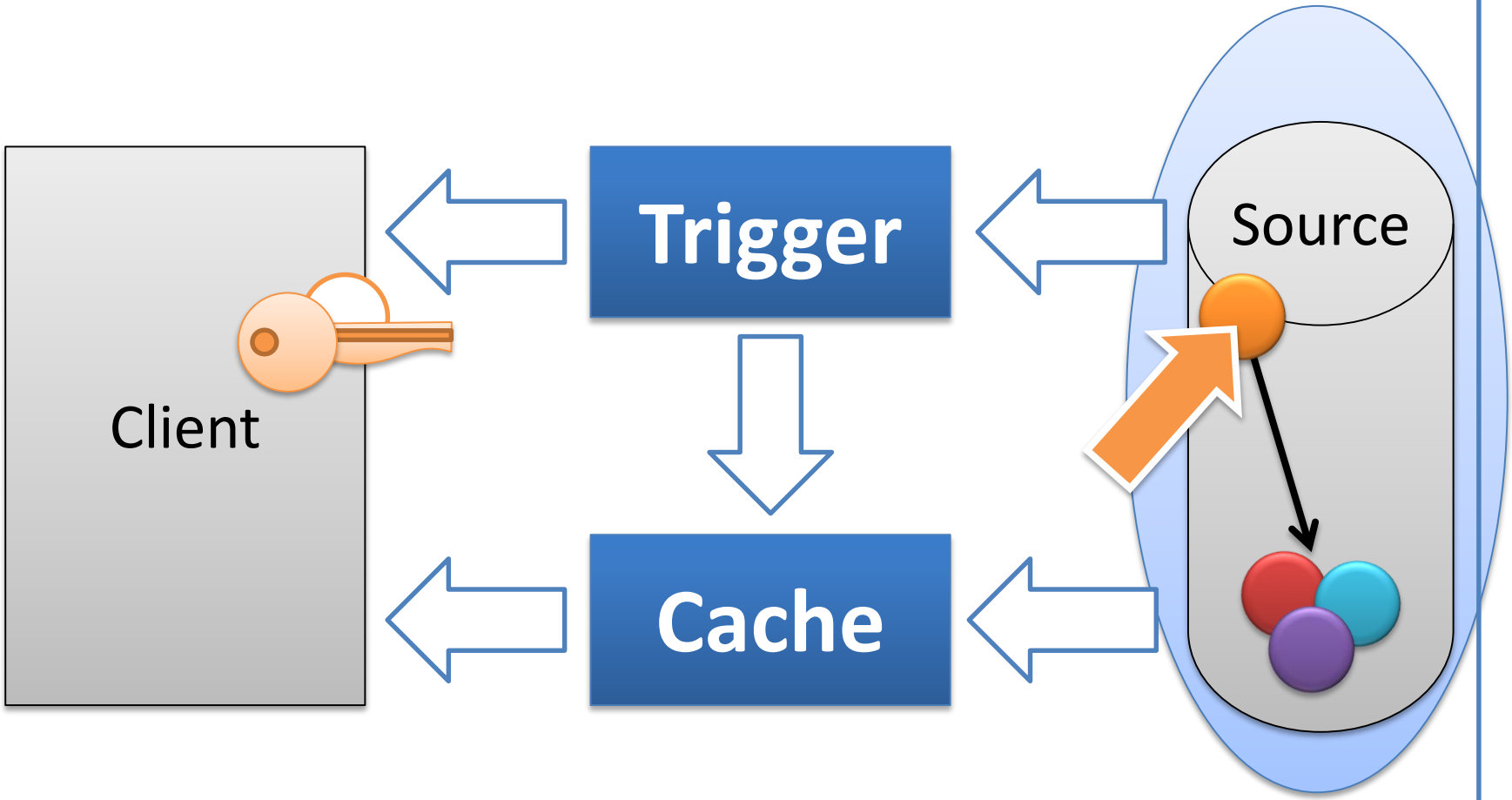
Cache Patterns

Pre-Fetch / Pre-Caching

Pre-Fetch / Pre-Caching



Pre-Fetch / Pre-Caching



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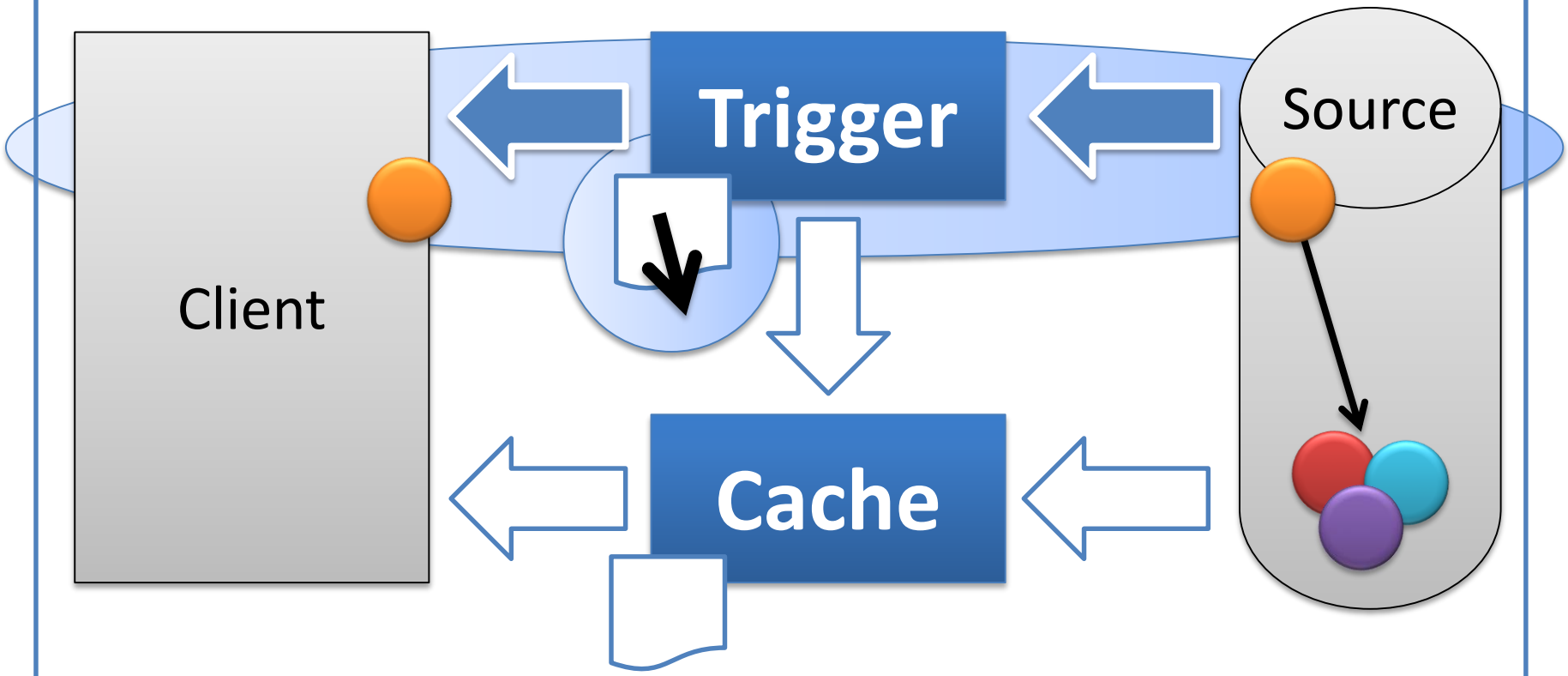

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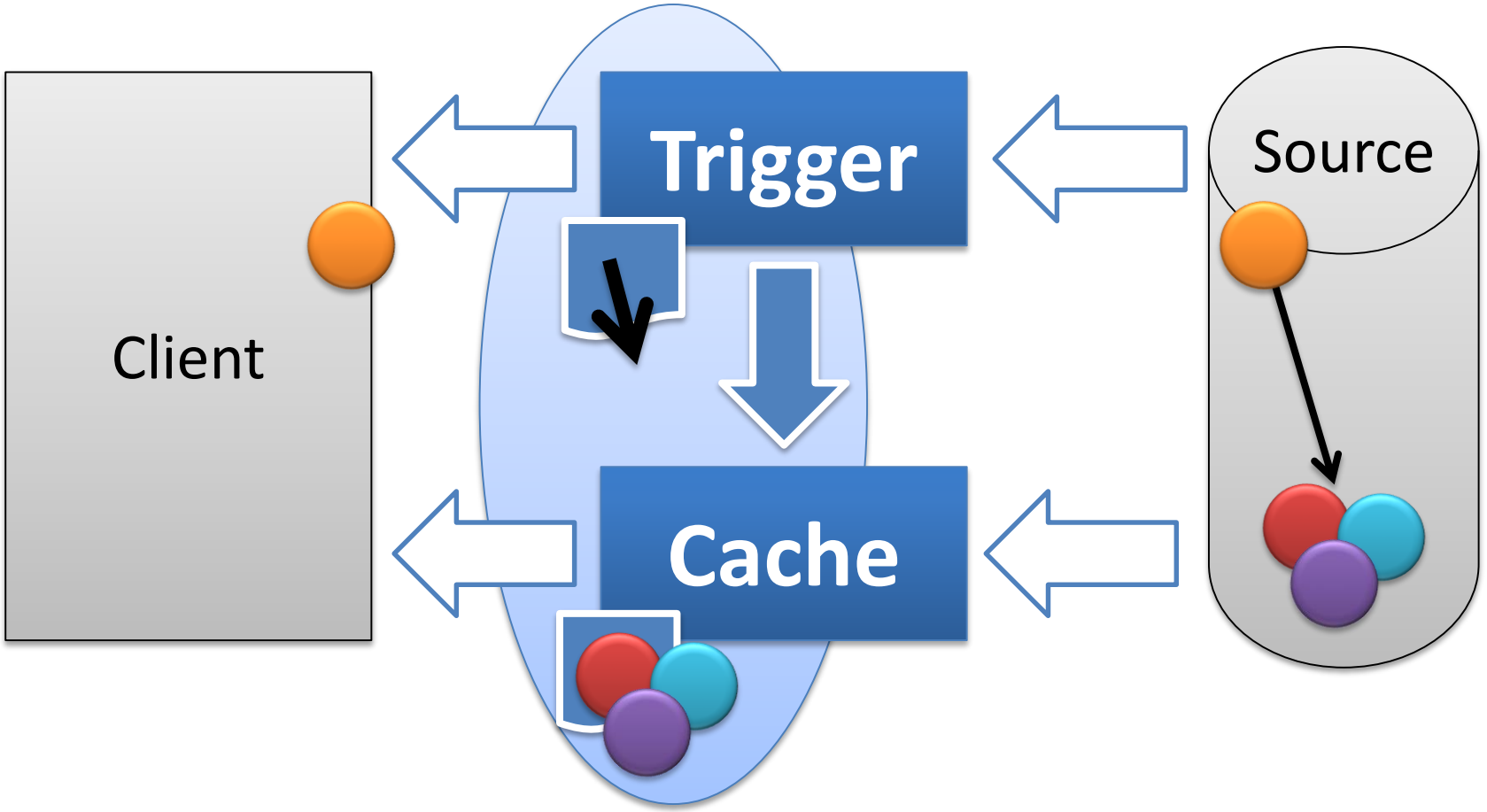
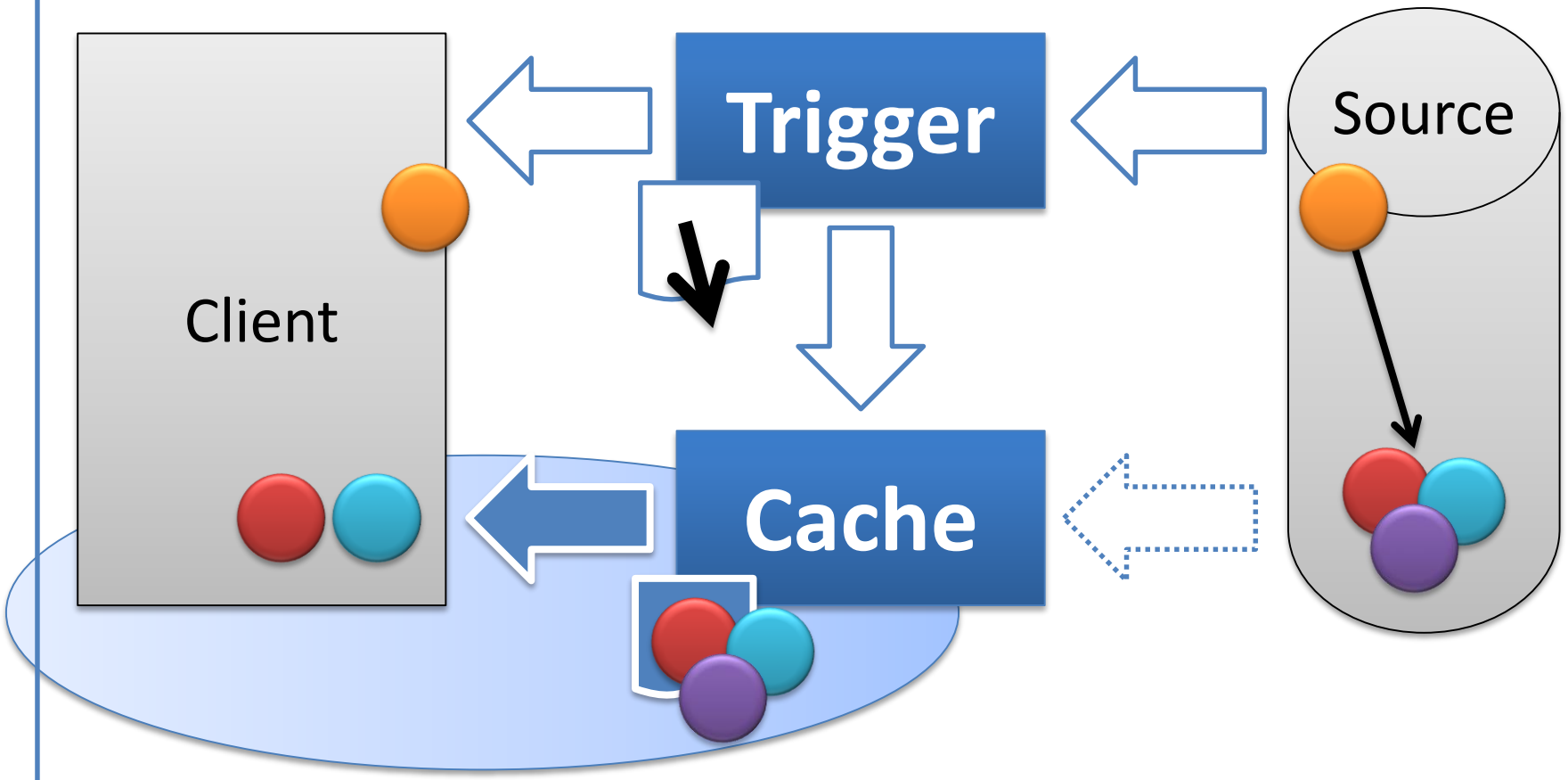
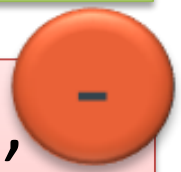


Pre-Fetch / Pre-Caching



- Fast read of non-repetitive data
- Prepare data for usage in advance
- Transparent work "behind the scene"



- Increased load on resources (data source, network, cache size)
- Redundant data in cache
- Complex trigger logic

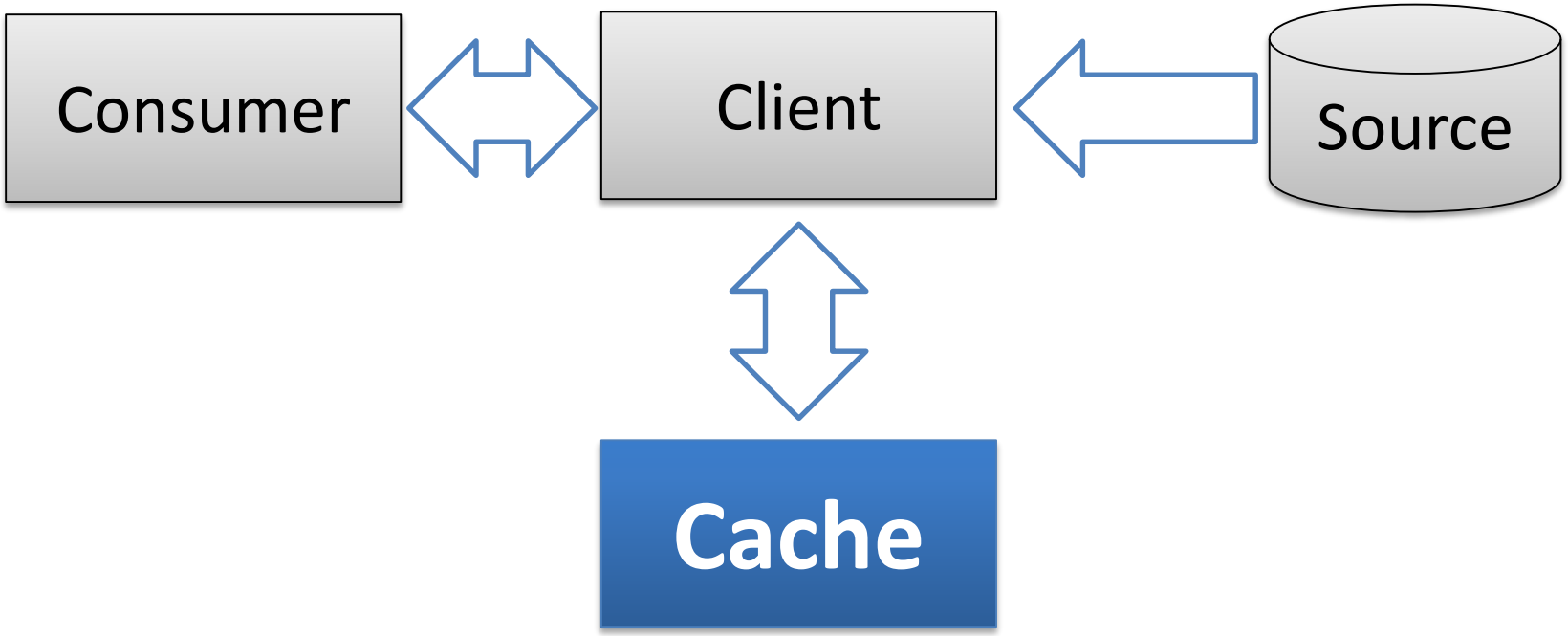
Pre-Fetch usage examples

- Master-detail pattern (search)
- Asynchronous page refresh
- Database pre-fetch
- Guided navigation
- Preload of web assets
- Automated and manual pre-fetching

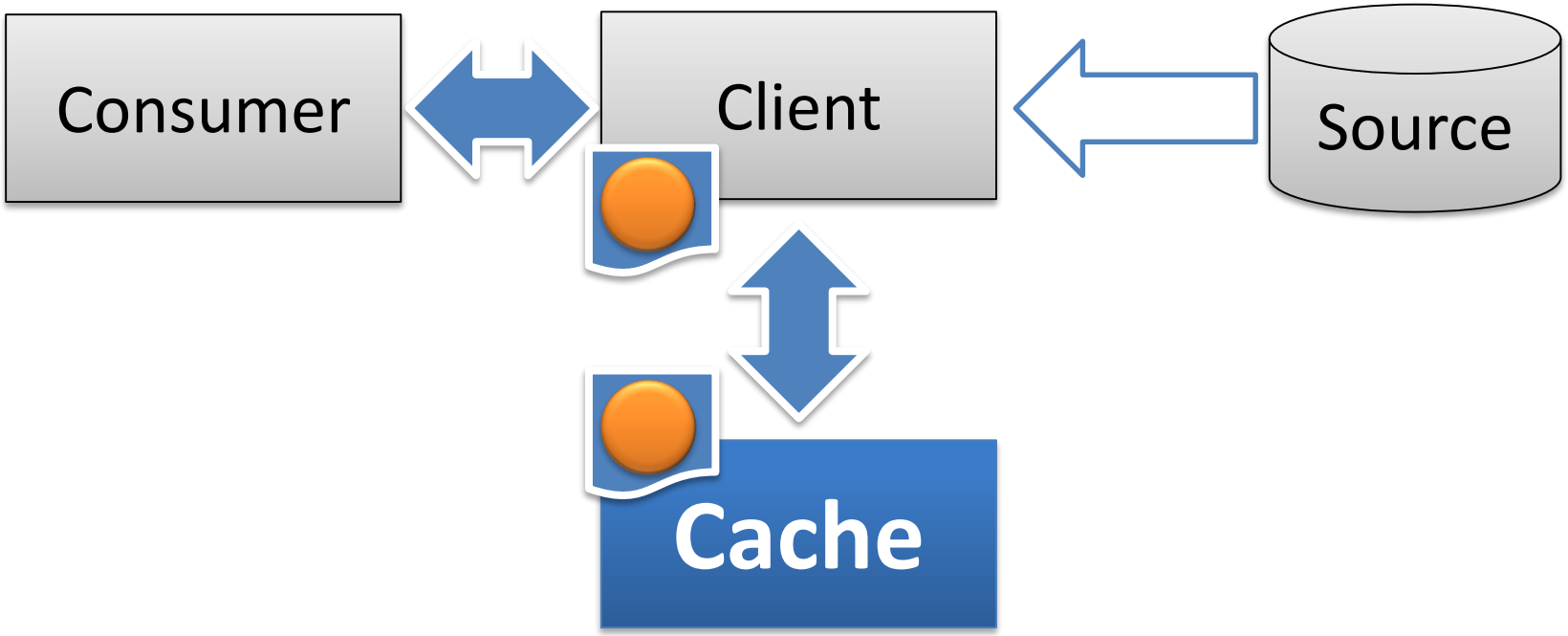
Cache Patterns

Side Cache

Side Cache



Side Cache



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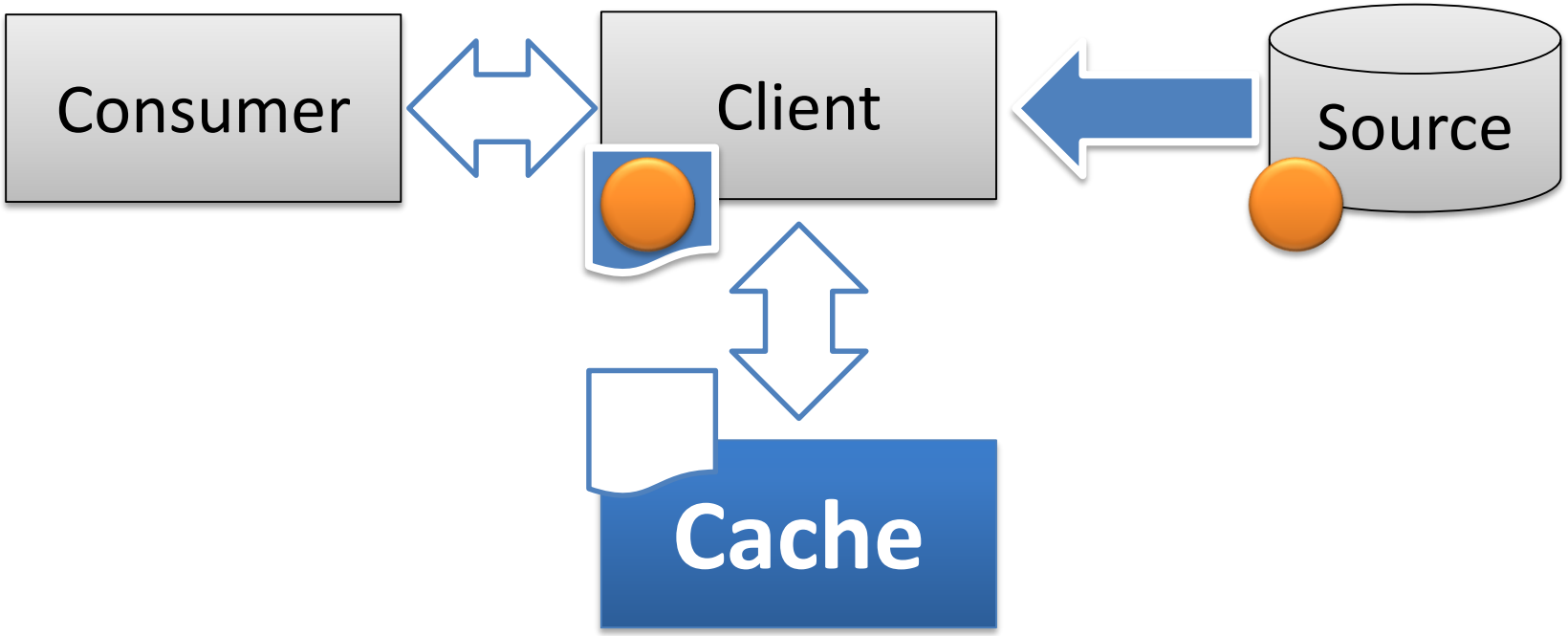

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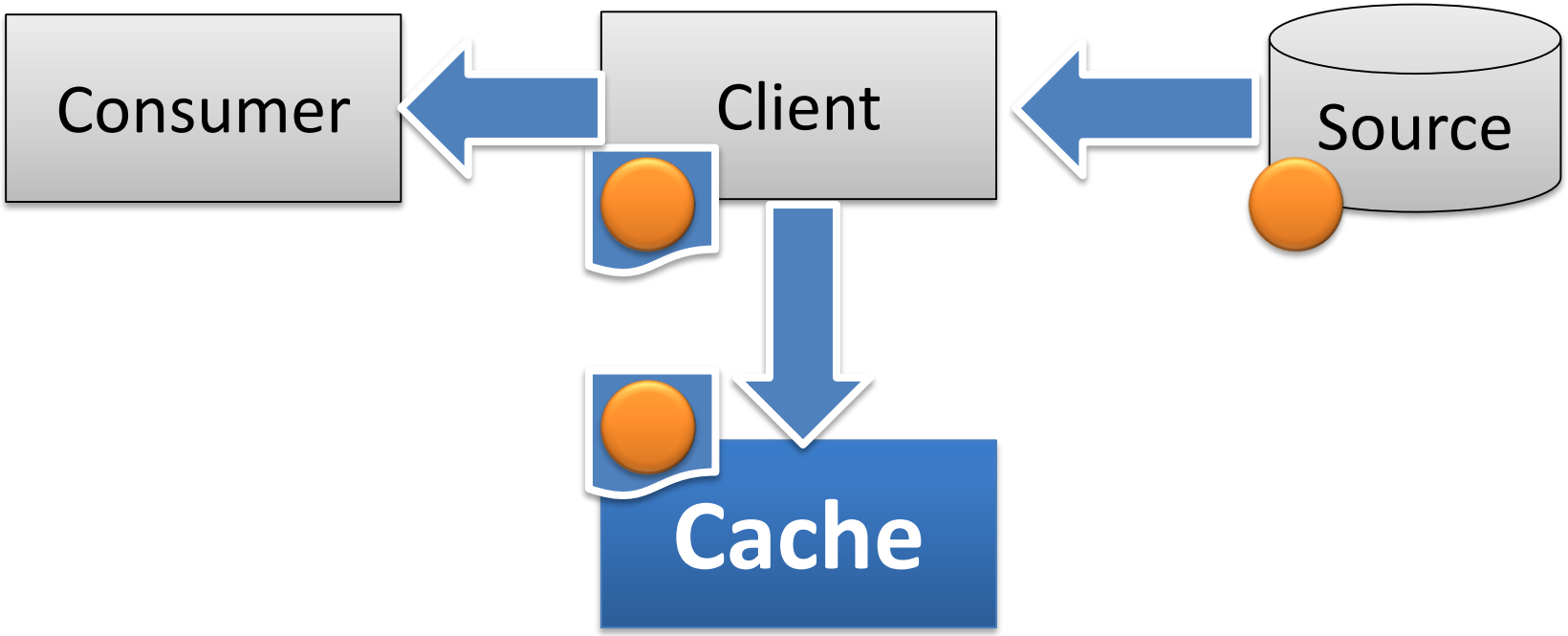


- Lower load to the data source
- Read Through emulation possible
- Effectively loads data on demand
- Data lifecycle management possible
- Supporting pre-caching might be used

- Not fully transparent
- Additional hops to the cache
- Not good for static data

Side cache usage examples

When dynamic data used

Resource demand is not predictable

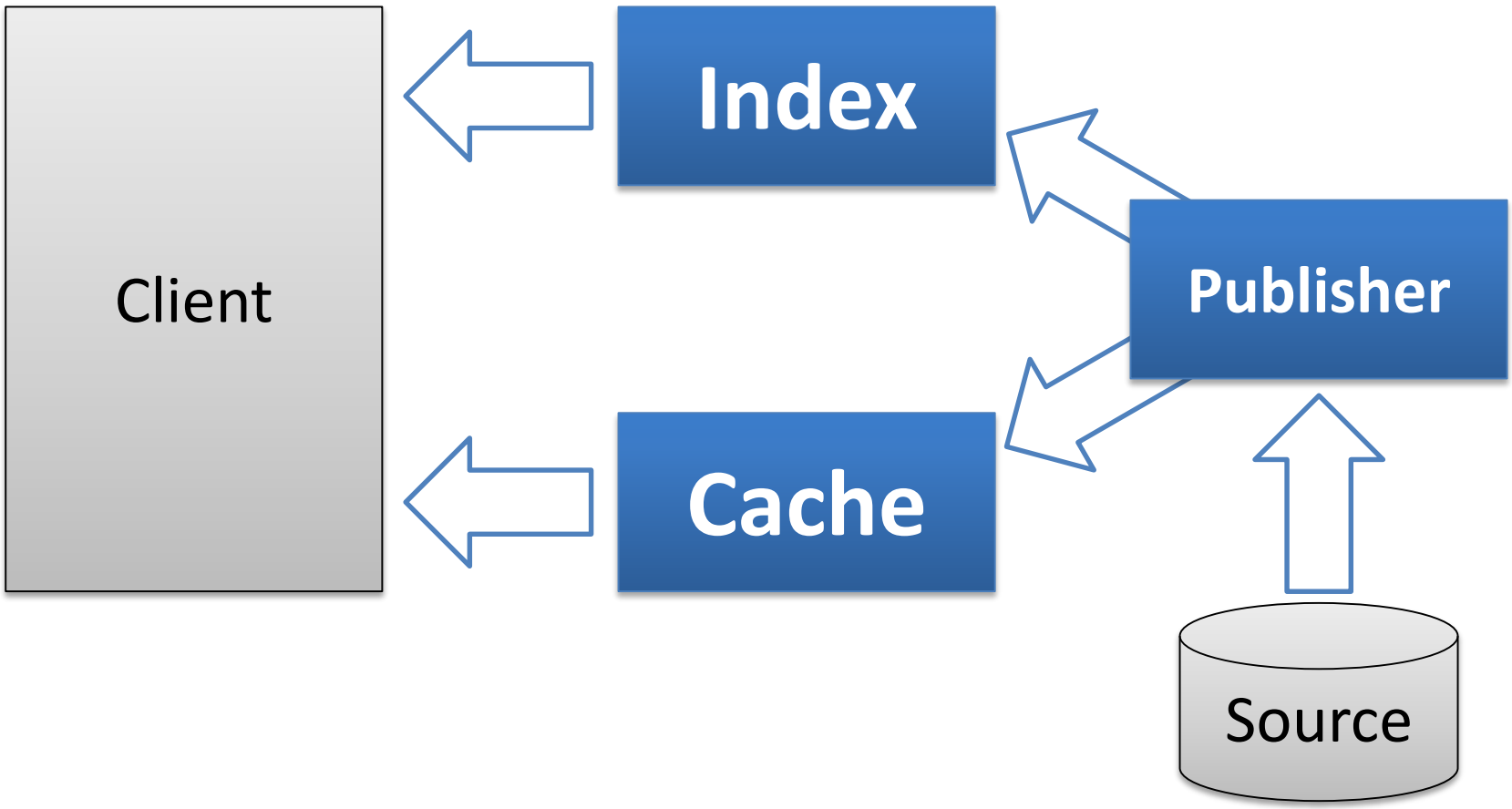
Local storage in browser

Large amount of data

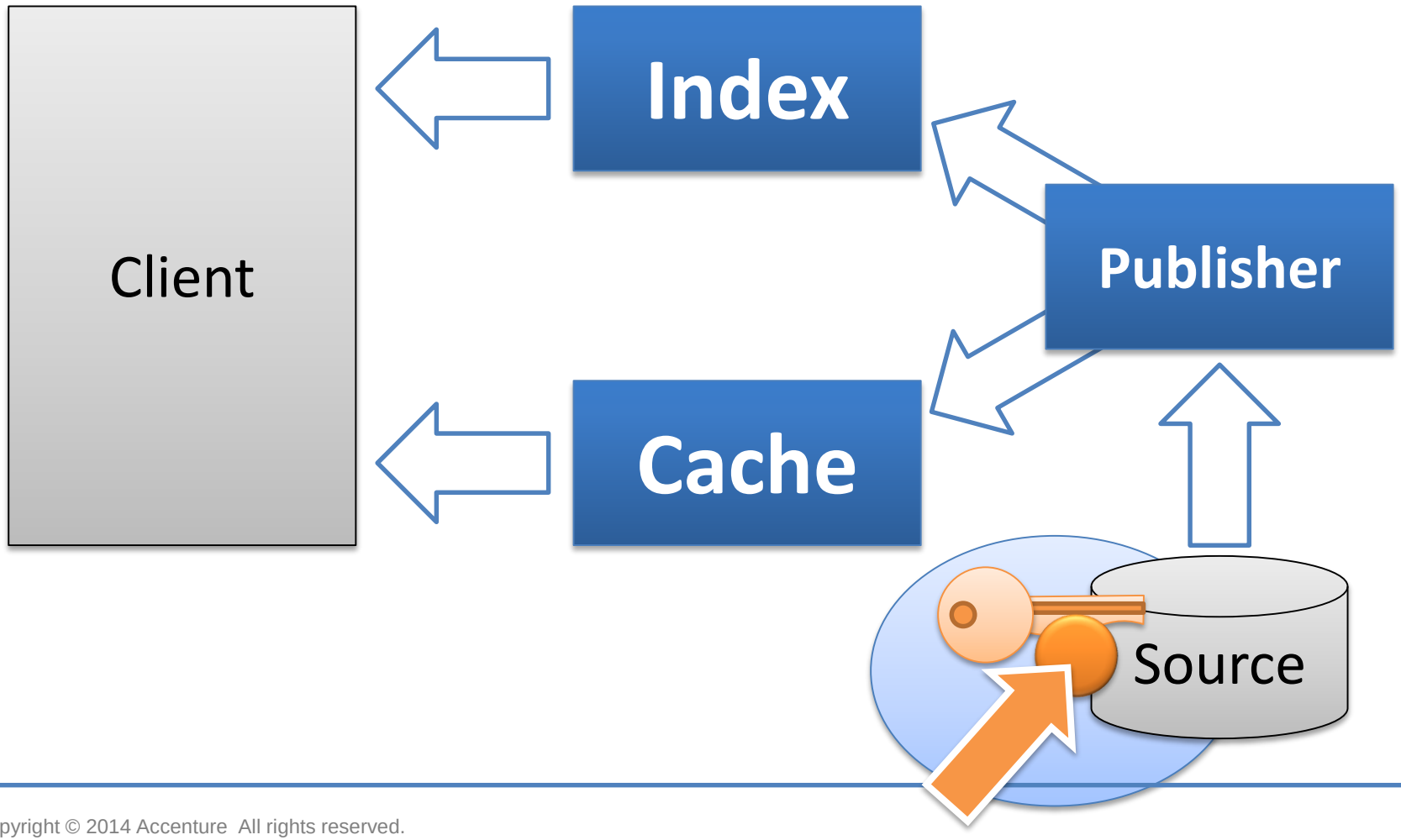
Cache Patterns

Publisher / Refresh Ahead

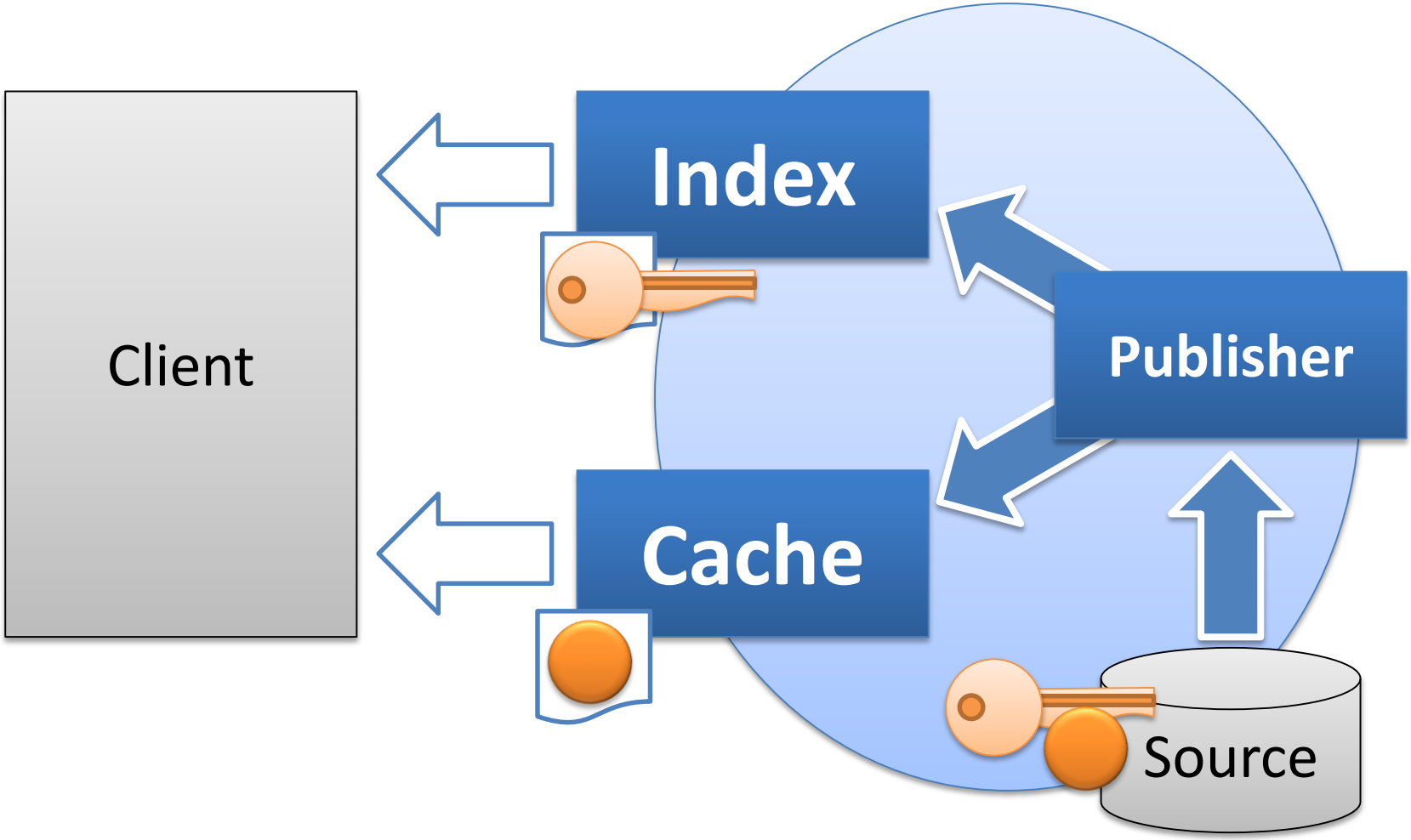
Publisher / Refresh Ahead



Publisher / Refresh Ahead



Publisher / Refresh Ahead



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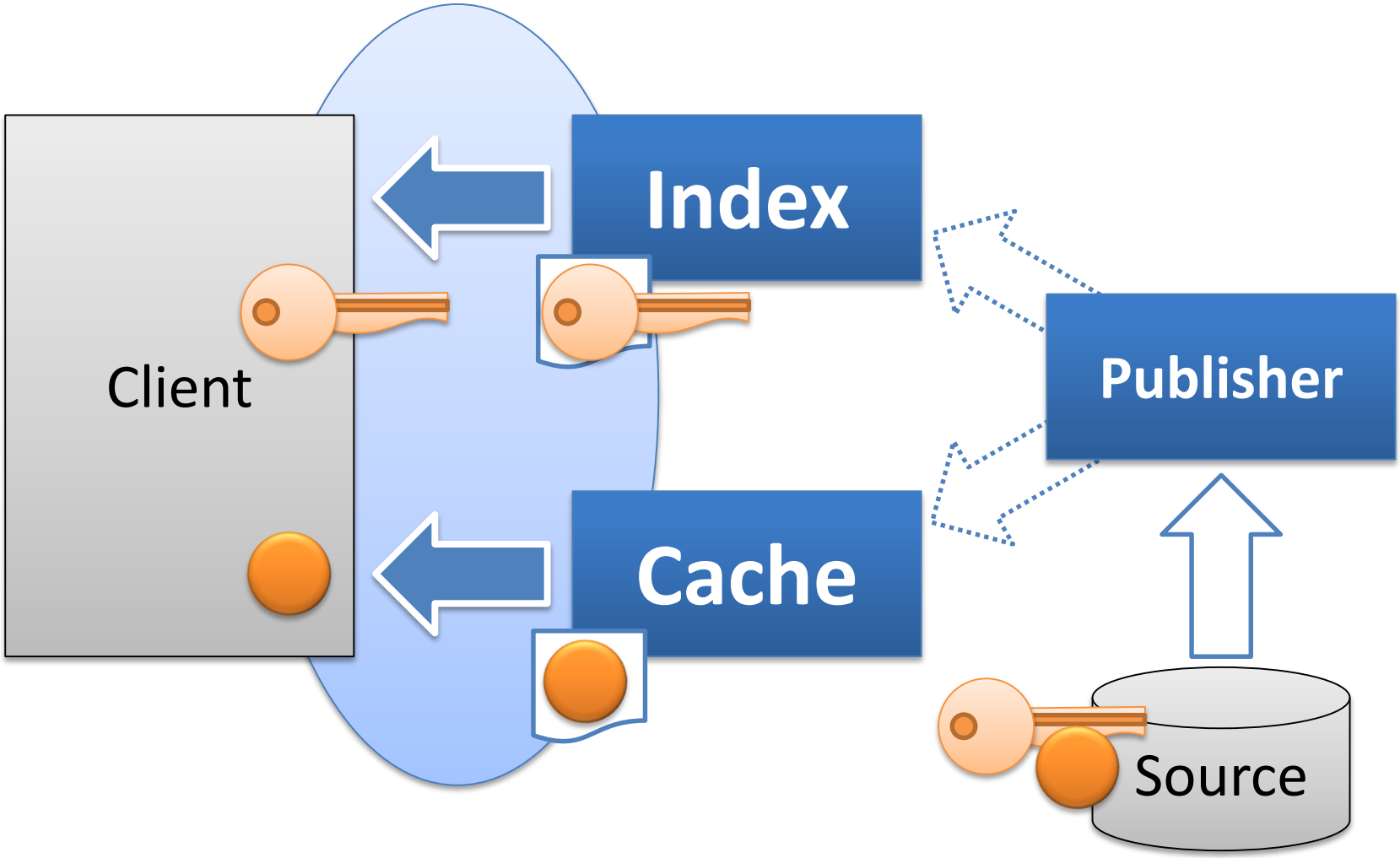


- Very high scalability
- Controlled “freshness” of data
- Distributed
- Data source does not limit the scaling of the application

- Read Only
- Does not reflect frequent changes
- Snapshot of data in history

Publisher usage examples

Good for static data

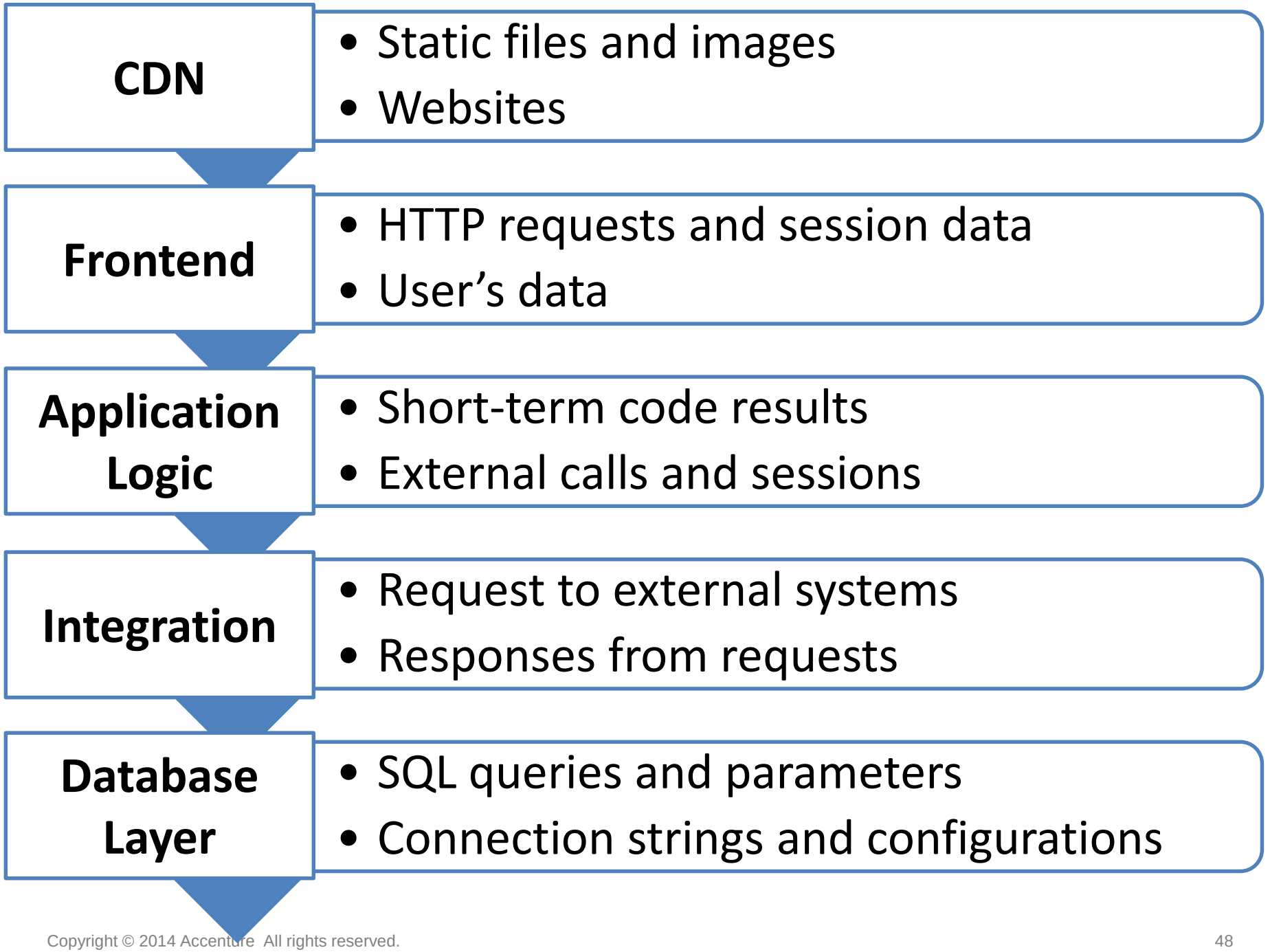
Optimized images for responsive design

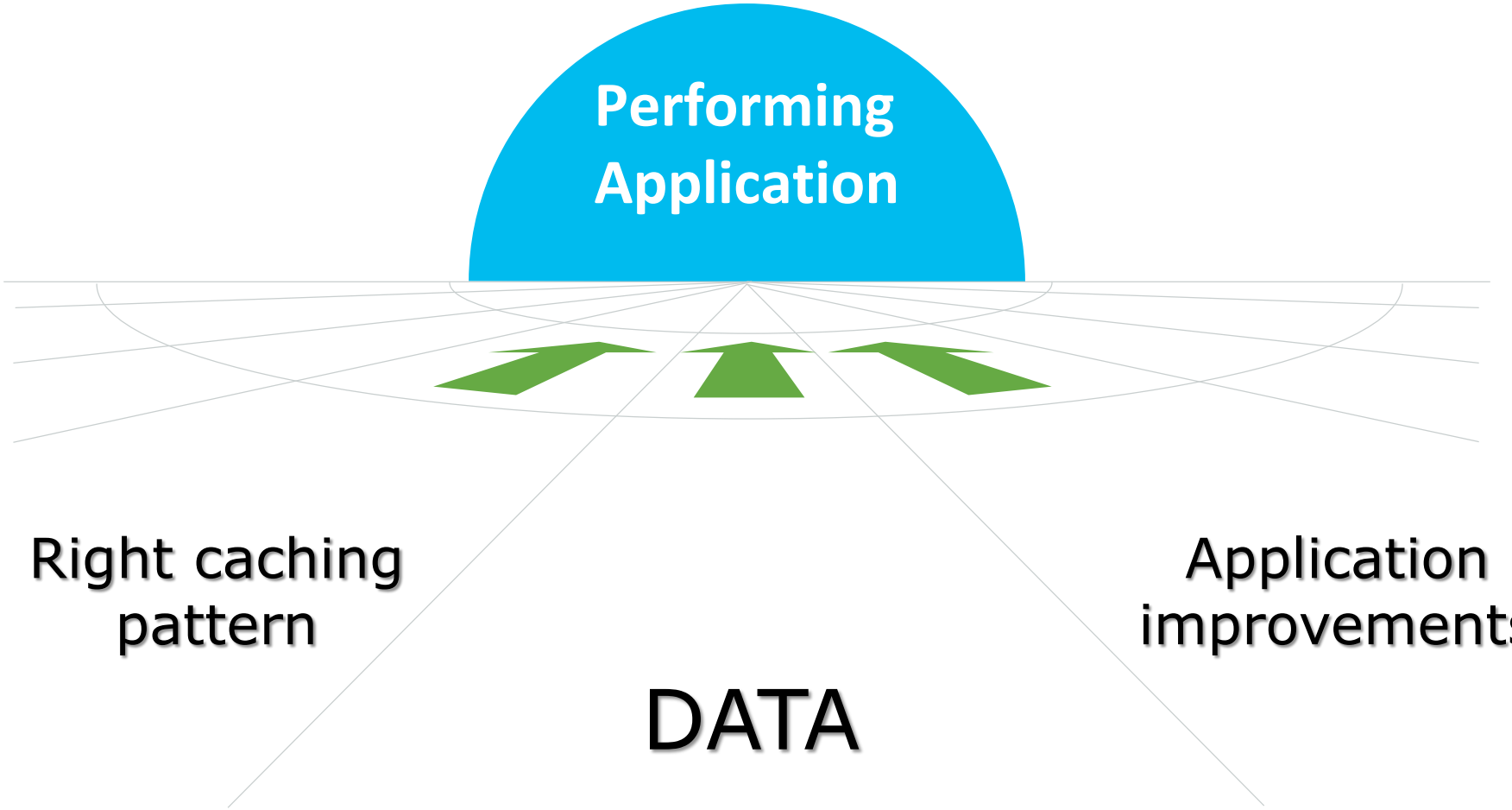
Reports, graphs

Documents in PDF / EPub / Mobi

Stock amount in Eshop

Data Distribution





Questions, Answers & Ratings

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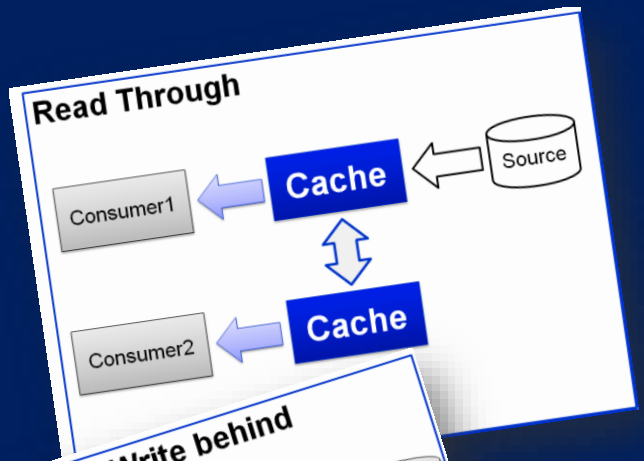

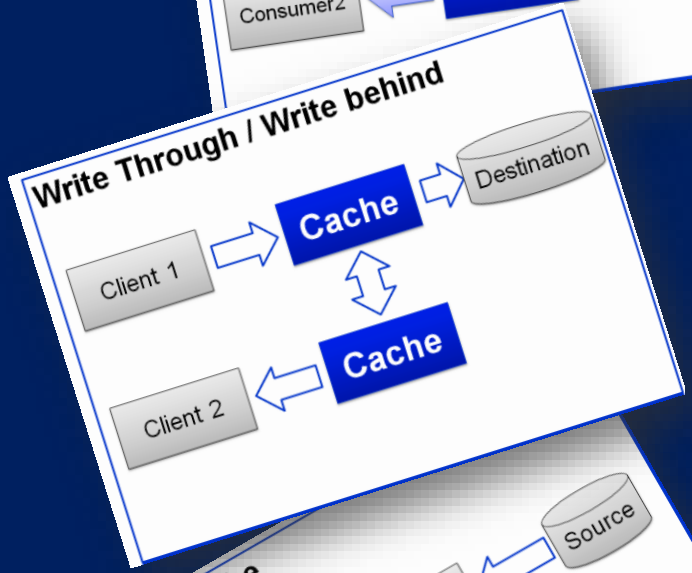

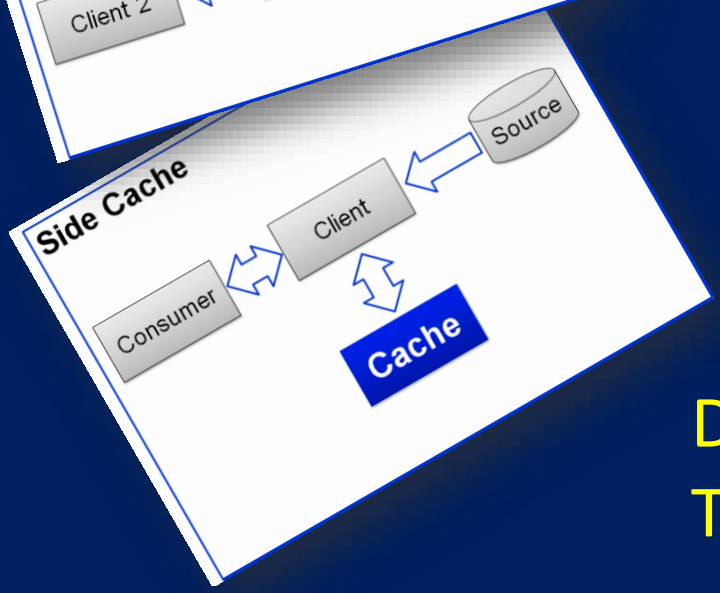

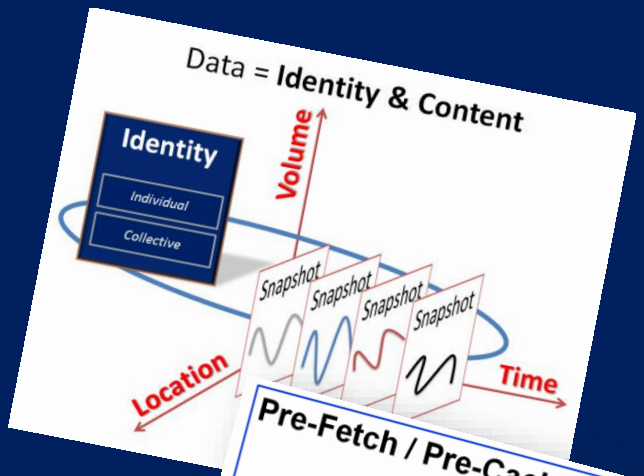

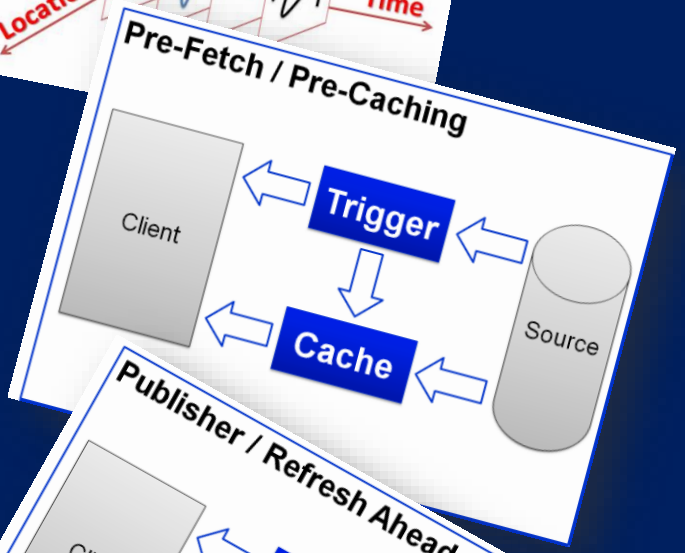

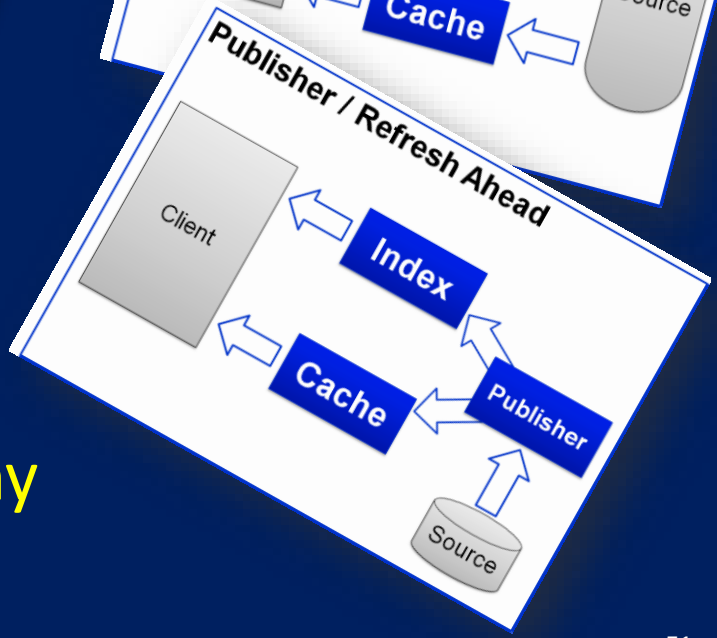

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