Better Indexation

without Performance

Penalty

Charities helping Ukraine

Ukrainian Foundation "Come Back Alive"

https://savelife.in.ua/en/

Dutch Foundatation "Sails of Freedom"

https://zeilenvanvrijheid.nl/





Passionate about open source projects

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Expert in optimizing web appplications

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one of grand-parents of Magento

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👲 Experienced in putting out fires on production systems

Normalized database structure is slower to query

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Expensive calculations on listing pages

- Normalized database structure is slower to query
- Expensive calculations on listing pages
- Text based search tokenization

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- Does not take into account changes from import/export
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- Prone to wait timeouts and deadlocks
- Update by Schedule
- Named mview, but not a real materialized view
- Observes data modifications with triggers
- Litters up your database with {mview_name}_cl tables

2.2.x - Blows up large databases because core team did not understand how <=> operator works

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- #23077 Triggers created by MView are triggered all the time
- 🤦 2.4.x Introduced better batching but made things worse
- #30012 Asynchronous indexing can break large servers
- #37367 Schedule index entities processed multiple times

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🔄 Dangerous when not configured properly in multi-origin replication

Can We do Better?

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Experienced DevOps already use it for replication

- Enabled by default on AWS RDS
- Row based format is default since MySQL 8.x
- Experienced DevOps already use it for replication
- 🣜 Gives complete access to data change history

```
[mysqld]
# Enables binary loggin with default file paths
log_bin
# Make sure you row based replication is used
binlog-format = row
# Reduce size of binary log to not include text and binary fields if they are not of
binlog-row-image=noblob
# Nice to have automatic clean up of binlog files
expire_logs_days = 5
max_binlog_size = 100M
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```

User Permissions

Make sure you have the following permission for your MySQL user

```
GRANT SELECT, REPLICATION SLAVE, REPLICATION CLIENT ON *.* TO '[USER]'@'%';
```

Not needed if you have all GRANT ALL, but it is good practice to create separate user with only this permissions.

Mritten in Rust as static binary

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No root permissions needed

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Connects to MySQL as Replication Client

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Analyzes Binary Log since last run



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Transforms Binary Events into Row Changes



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Maps Row Changes into Domain Updates



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Aggregate reduces Domain Update into Log Output



- 🥵 Analyzes Binary Log since last run
- 📩 Transforms Binary Events into Row Changes
- Maps Row Changes into Domain Updates
- Aggregate reduces Domain Update into Log Output
- Magento processes Log Output and updates MView

Nailable also as Cargo library

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X Easy to create own Mappers

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X Easy to create own Mappers

Sample Application Skeleton (coming)

```
pub struct MyAwesomeTableMapper;
impl ChangeLogMapper<ProductChange> for MyAwesomeTableMapper {
    fn map event(&self, event: &Event, schema: &impl TableSchema)
        → Result<Option<ProductChange>, Error> {
        Ok(match event {
            Event:: UpdateRow(row) ⇒ FieldUpdate
                :: new(row.parse("product id", schema)?)
                    .process_field_update("not_awesome_field", row, schema)
                    .process_field_update("super_awesome_field", row, schema)
                    .into change log()
                None.
```

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pub struct MyAwesomeTableMapper;
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```
impl ChangeLogMapper<ProductChange> for MyAwesomeTableMapper {
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Event:: UpdateRow(row) ⇒ FieldUpdate
    :: new(row.parse("product id", schema)?)
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```
.process_field_update("not_awesome_field", row, schema)
.process_field_update("super_awesome_field", row, schema)
```

```
.into change log()
```

```
Ok(match event {
        None,
```

```
pub struct MyAwesomeTableNameMatchMapper;
impl ChangeLogMapper<ItemChange> for MyAwesomeTableNameMatchMapper {
    fn map event(&self, event: &Event, schema: &impl TableSchema)
        → Result<Option<ItemChange>, Error> {
         Ok(match schema.table name() {
            "my_awesome_table_for_product" ⇒ MyAwesomeTableMapper
                .map event(event, schema)?.map(ItemChange:: ProductChange),
              → None
        })
```

```
fn map event(&self, event: &Event, schema: &impl TableSchema)
    → Result<Option<ItemChange>, Error> {
```

```
Ok(match schema.table name() {
   "my_awesome_table_for_product" ⇒ MyAwesomeTableMapper
       .map event(event, schema)?.map(ItemChange:: ProductChange),
```

```
Ok(match schema.table name() {
     → None
```

Add to App Skeleton

```
Application::parse()?
    .with_mapper(MyAwesomeTableNameMatchMapper)
    .run().await?;
```

Eager for Nmbrs?

Updating Product Data with Changelog

Product Category MView Time: 7.19157s

```
"attributes":{
    "106":[ 31, 14, 27, 58 ],
    "124": [ 16, 76, 10, 2 ],
    "97":[ 646, 403, 773, 41553, 306, 756 ],
    "99":[ 712, 45, 334, 690, 426 ]
},
"entity": "product",
"metadata":{
    "file": "47de4c575982-bin.000001",
    "position":3086928,
    "timestamp":1683532855
```

```
"attributes":{
```

```
"106":[ 31, 14, 27, 58 ],
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```
"metadata":{
    "file": "47de4c575982-bin.000001",
    "position":3086928,
    "timestamp":1683532855
```

```
enum AggregateKey {
    Created,
    Deleted,
    Field(&'static str),
    Attribute(usize),
    WebsiteAll,
    WebsiteSpecific(usize),
    CategoryAll,
    CategorySpecific(usize),
    Link(usize),
    Composite,
    MediaGallery,
    TierPrice,
```

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Created,
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Composite,
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Support for Category Entity

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Support for Staging in Adobe Commerce

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X Support for Custom Tables via Configuration File

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- Support for Magento 1.x

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- Support for Staging in Adobe Commerce
- X Support for Custom Tables via Configuration File
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- Note: Plug-and-Play Composer based Module with Binary

Get Invovled

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Join Mage-OS Community mage-os.org

Get Invovled

Union Mage-OS Community mage-os.org

Follow on GitHub EcomDev/mage-os-database-changelog

Bright Future Ahead

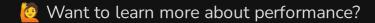
Bright Future Ahead

Security monitoring tool based on database changelog

Bright Future Ahead

Security monitoring tool based on database changelog

Thank You



🌴 Join performance training this July in Barcelona, Spain



bit.ly/mage-performance-training