

AEROSPIKE
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Development of highly scalable applications with Aerospike at Schwab



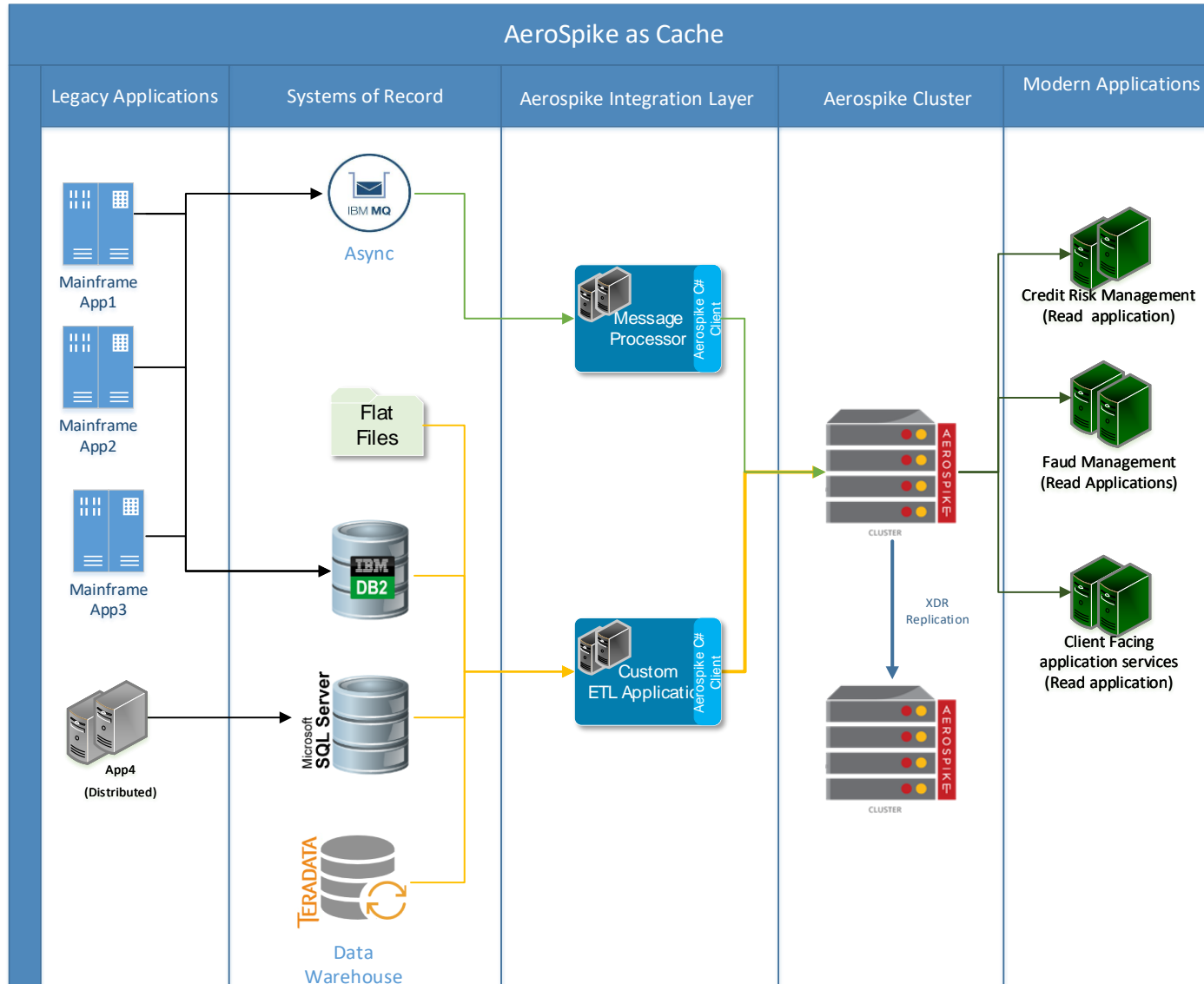
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Developing highly scalable applications at Schwab

- Goal
 - To deliver faster, cheaper and highly scalable solutions
- Key outcomes
 - Ultra low latency
 - Highly scalable
 - Highly available
- Application categories
 - Read applications
 - Write applications
 - New applications that generates lots of historical data

Read applications- Aerospike as Cache

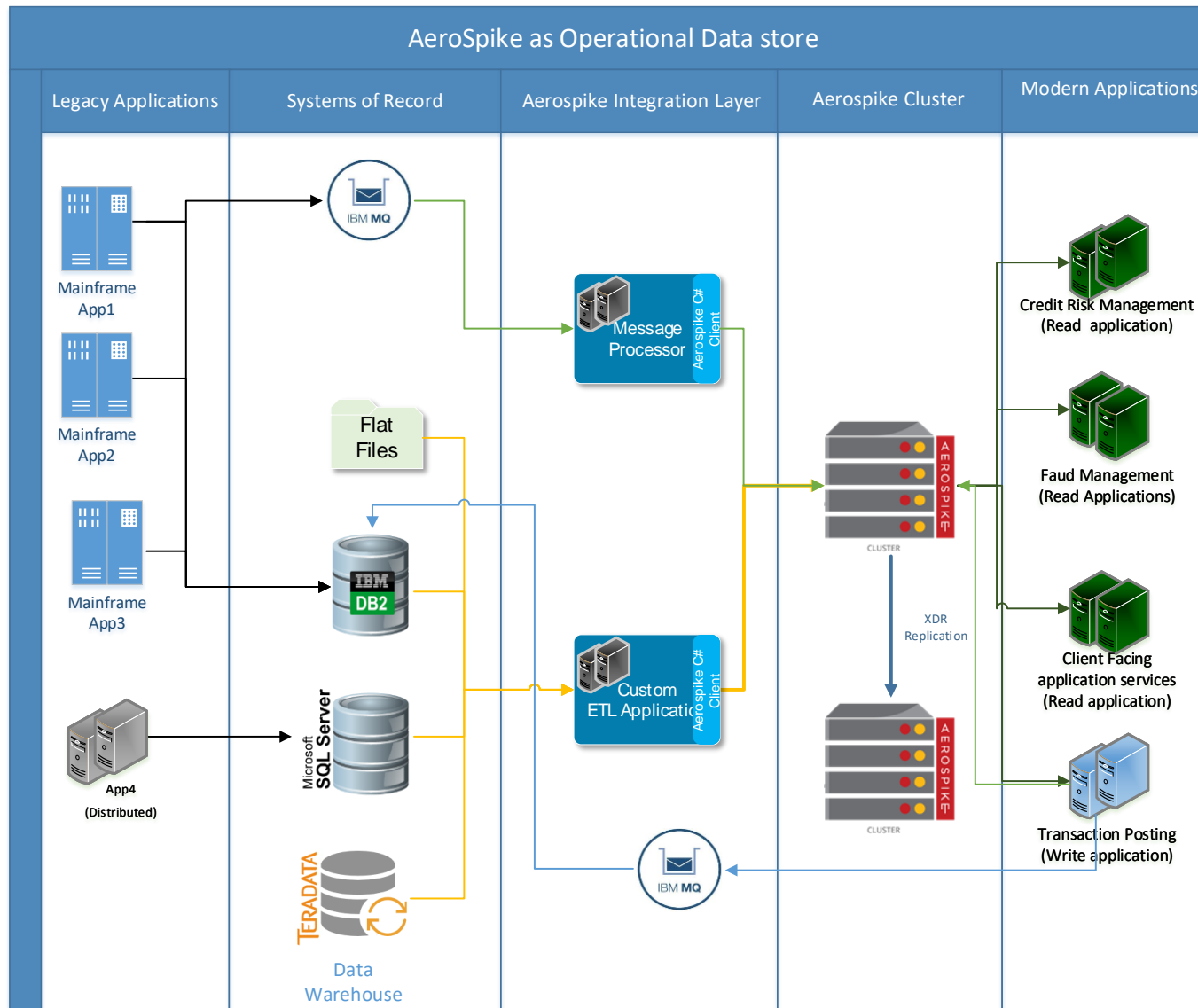


- Depending on the source system capabilities, implemented daily refresh of the data by various strategies like daily file refresh, intraday event-based refresh, weekly file refresh etc.
- For consistency to customer experience during daily refresh time, implemented blue/green kind of set switching
- Majority of the data is refreshed on daily basis
- Account level refresh of data is implemented for operational needs.

Business capabilities delivered

- **Client interaction is independent of source systems availability**
- **Highly performing application layer** - Scaling is easy with application layer deployed in private cloud and for Aerospike adding nodes to cluster
- **Application availability is decoupled** with systems of record availability.
- **Low latency**
 - 99.9% of reads from Aerospike are < 1 ms
 - Data is stored in readily consumable format
 - performing over 13B queries against Aerospike in a day with 99.9% of the requests returned in < 1 ms
- **Highly available database architecture** - There was no outage in production because of Aerospike
- **Enabled to develop near real time Credit risk monitoring system** - an industry leading capability
- **Went live with 1st application in 2015**

Write Applications - Aerospike as intraday operational data store (ODS)

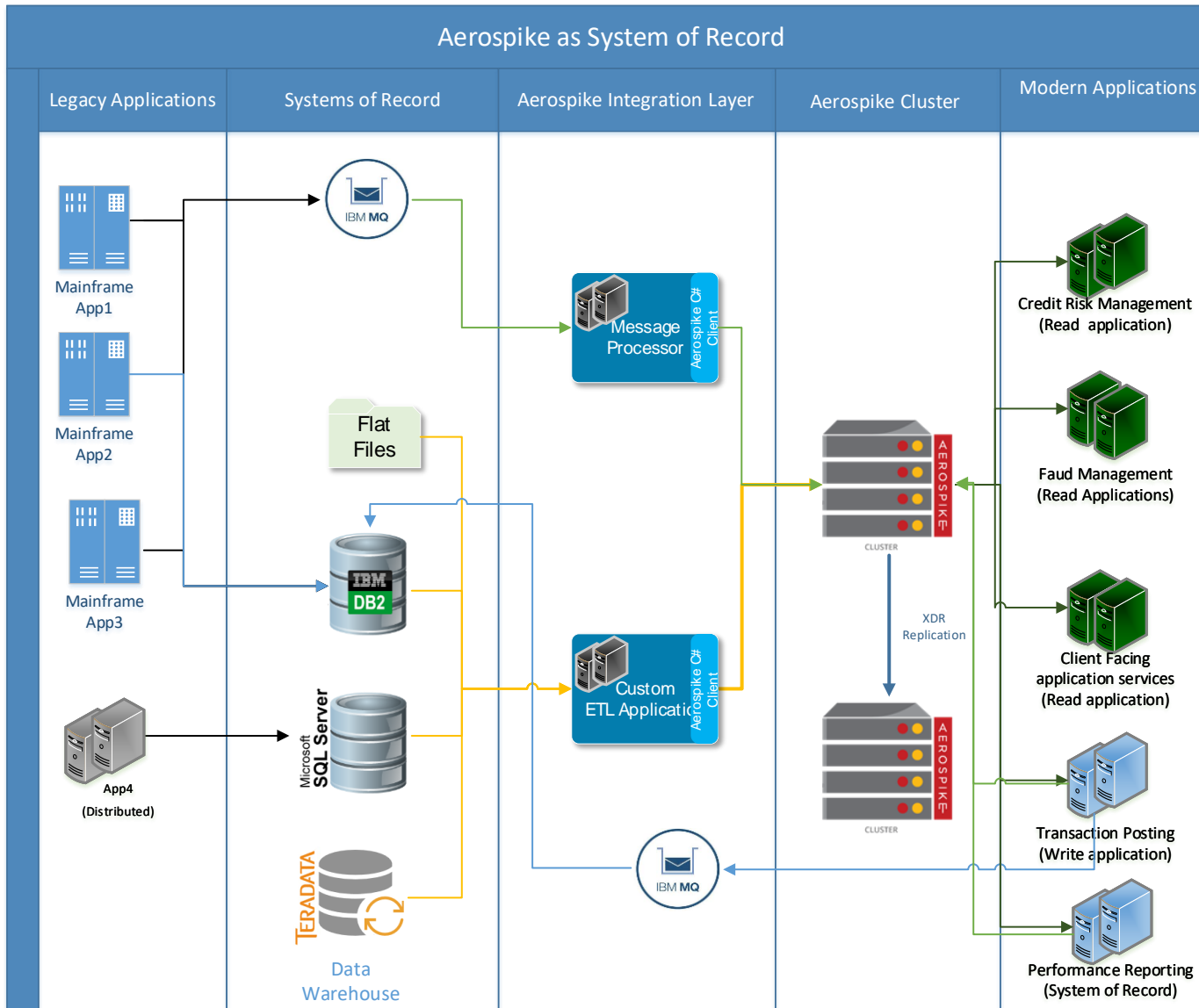


- Write application will read from Aerospike and will also write to Aerospike
- Implemented business needs like sequential processing, strong consistency at high throughput
- System of record is updated async, so even if that application is not available there is no impact to customer experience

Business capabilities delivered

- **Client-facing write capabilities** are handled by middle tier application layer deployed on Aerospike
- **Asynchronously system of record is updated**, a complete shift in paradigm
- **Even when a source system is not available**, clients are not impacted
- **Highly available and highly reliable middle tier application layer**
- **Aerospike is system of record during intraday**, a true Operational data store
- **Went live with 1st application in 2018**

New Applications that generates lots of data- Aerospike as System of Record



- This use case is applicable for new capabilities developed that are not on Legacy and the data generated is not required by Legacy applications.
- When the data generated by the new application is huge, then this use case has more value.

Business capabilities delivered

- The data is expected to grow very large, into 500 TB in next few years
- Real time access to all data, easy to scale and manage
- Leveraging Backup and recovery capabilities of Aerospike
- Plan to go live with this application in Q4'2020
- With this use case, both read, write as well as system of record are developed in Modern app tier

Thank You

Questions?

