

FINOS

Fintech
Open Source
Foundation



Open Source Technology to Build and Constantly Evolve a Low Code Application Platform

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FINOS Director of Community

Presenter - Stephen Murphy
CEO - Genesis Global

May 2020



Presentation Agenda

- **Genesis Vision & History**
- **The Genesis Low Code Application Platform (LCAP)**
- **Challenges of using Open Source**
- **Genesis's Lessons Learned using Open Source**
- **Examples of Open Source in the Genesis LCAP**

Genesis Vision & History

“The Leading Low Code Application Platform
Provider in Capital Markets”

Perfect Storm

Microservices

Open Source

Cloud Services

Industry

Genesis 0.0

Technology R&D

Genesis 1.0

Launch

2013

2014

2015

2016

2017

2018

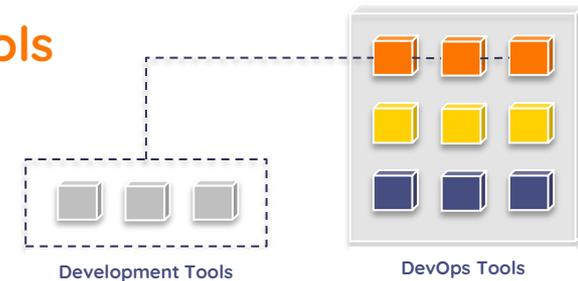
2019

2020

“Throughout the platform whether tooling, business components or core technology we use open source technology”

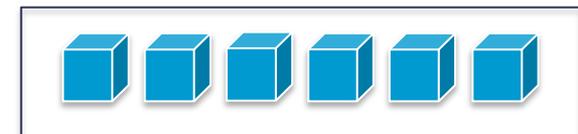
No Code / Low Code / Pro Code Platform Tools

Whether it is building new Web UI's, creating new environments or monitoring the production infrastructure we provide a complete set of tools



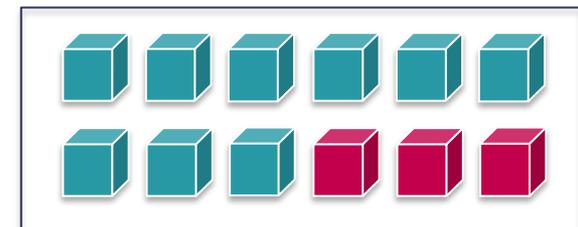
Business Component Library

Specific Financial Markets adapters such as FIX, FpML, Pershing, Murex, Calypso, Bloomberg TOMS & SSEOMS, TT, IRESS, Geneva and many more



Microservices Application Infrastructure

Architecture and development building blocks for all highly resilient, performant and scalable Capital Markets applications



In some ways Open Source is “low code” because with Open Source software you need less code

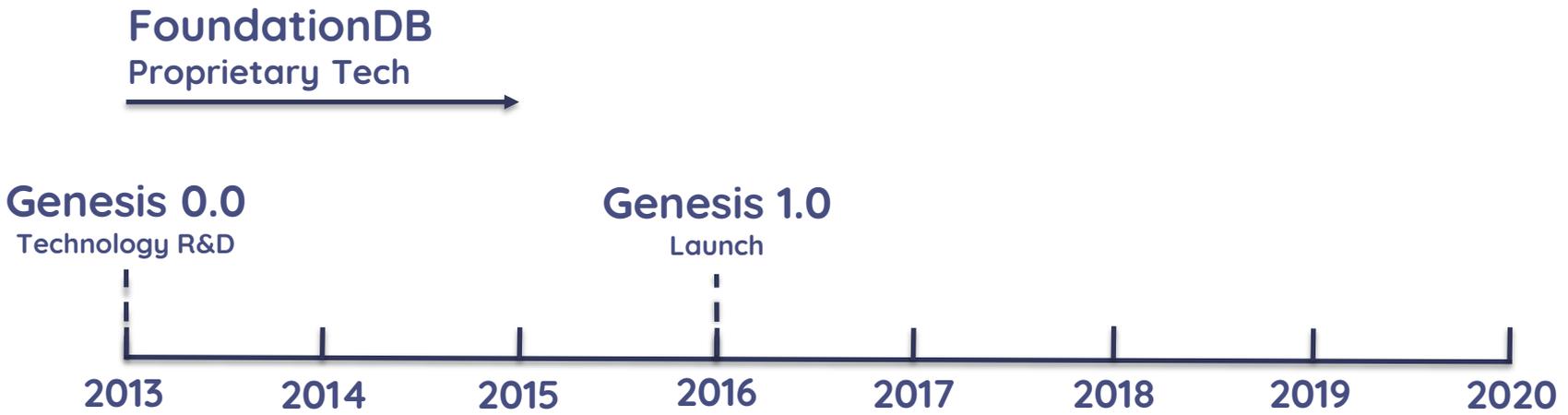
Challenges

With so many Open Source technologies available such as database, network libs, etc... there is a risk in choosing one:

- Choose the wrong technology for the use case
- Better technology comes along afterwards
- If you need to change technology how much time & cost
e.g. NoSQL Databases have their own specific API which are not trivial to use

Genesis Database - History

FoundationDB
Proprietary Tech



Genesis 0.0
Technology R&D

Genesis 1.0
Launch

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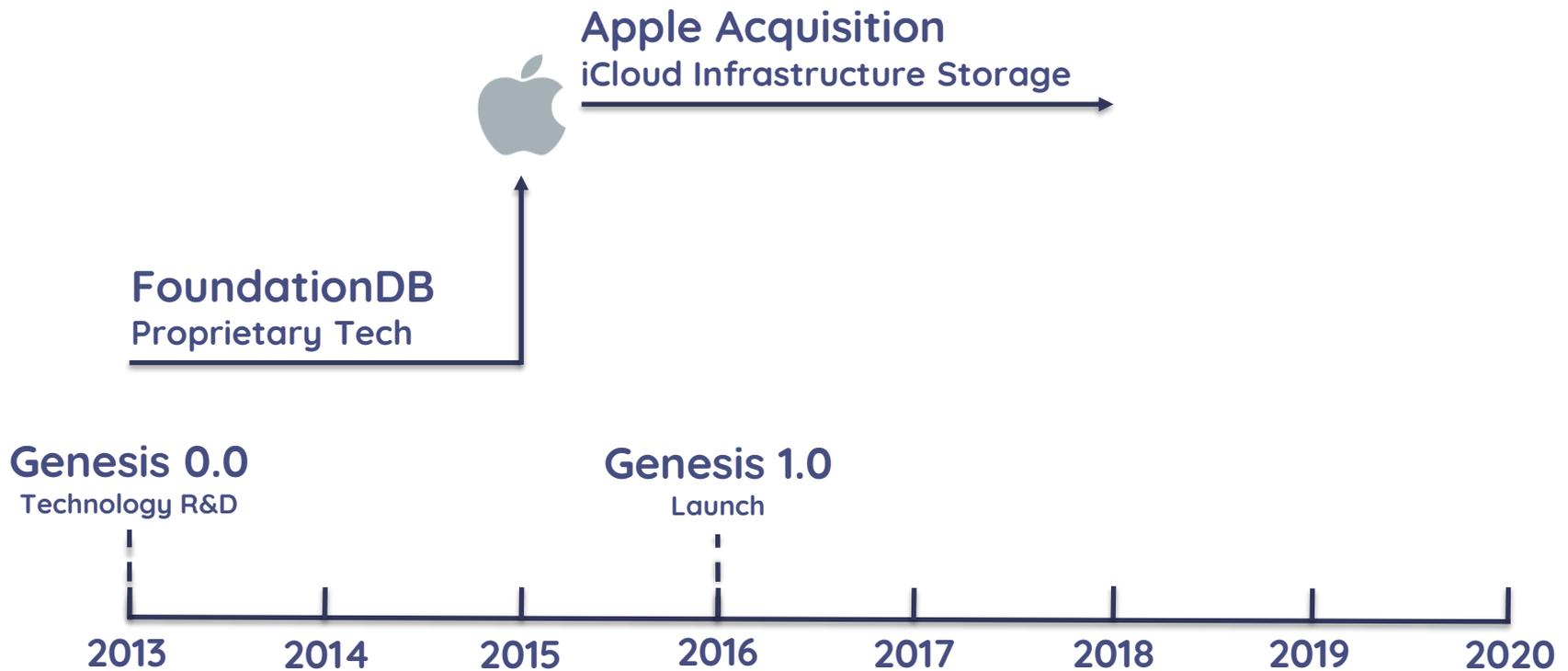
2018

2019

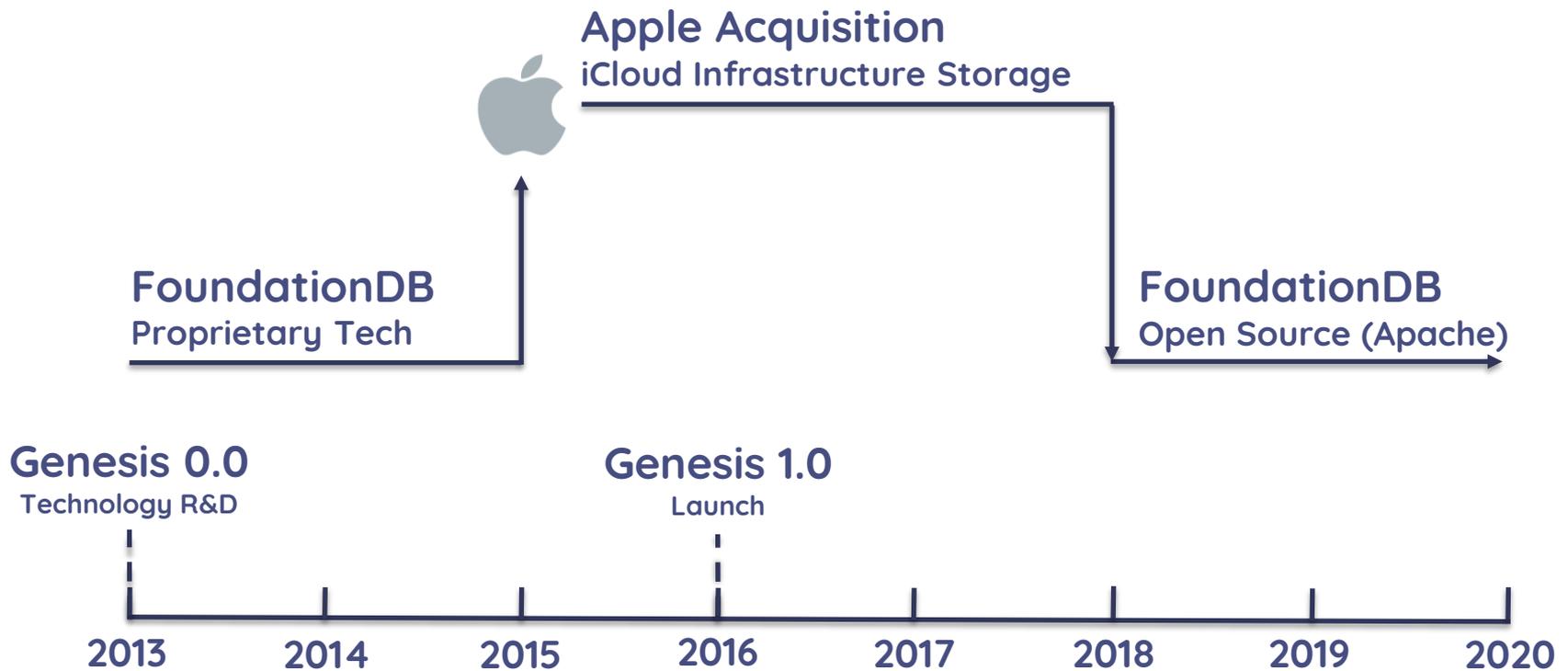
2020

<https://dbdb.io/db/foundationdb>

Genesis Database - History



Genesis Database - History



Genesis Database - Lessons Learned

Proprietary technologies posed high risk

Fortunately we learned early in our journey
e.g. at the time “fortunately” = “unfortunately”

Our platform had to provide an abstraction layer to each core part of the system

Genesis 0.0
Technology R&D



Genesis 1.0
Launch

2013 2014 2015 2016 2017 2018 2019 2020

Genesis Platform Today - Database Abstraction

Harness the power & efficiency of a particular DB for the specific business use case

DB Abstraction Layer

Aerospike

FoundationDB

Postgres

& Others

Genesis 0.0
Technology R&D



Genesis 1.0
Launch



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2020

Three important examples where we use Open Source:

1. Event Processing

Reactive Extensions for composing asynchronous & event based observables sequences (www.reactivex.io)

2. Event & Notification Message Bus

Initially ZeroMQ, then due to challenges in the cloud (multi-cast between servers) we move to **Aeron** (we also support Solace)

3. Database Layer

Depending on the use case we support 3 open source databases FoundationDB, Aerospike and Postgres (which supports others)

1. Event Processing – Reactive Extensions (RX)

- **Abstraction**

RX abstracts concerns around low-level threading, synchronization, thread-safety, concurrent data structures & non-blocking I/O

- **Simplification of Asynchronous Events**

RX model allows you to treat streams of asynchronous events with the same sort of simple, composable operations that you use for your classic collections of data items

- **Robust & Familiar Library (Microsoft & Netflix)**

Widely used in software solutions: database APIs (e.g. Couchbase), front-end platforms (e.g. Angular), libraries (e.g. Retrofit).

2. Event & Notification Message Bus - Aeron

- **ZeroMQ**

Great initial messaging bus within the platform but had downsides within cloud infrastructure, widely used technology

- **Aeron**

Built for performance with highest throughput & most predictable messaging with Simple Binary Encoding (SBE) also FIX aligned (<https://www.fixtrading.org/standards/sbe/>)

- **Solace**

Again in a similar way to databases we also support another messaging technology for Capital Markets & Finance based clients

3. Database Layer (Non-Timeseries Data)

- **FoundationDB**

Horizontally scalable, multi-record ACID guaranteed transactions, focus on reliability and consistency (CP mode)

- **Aerospike**

Horizontally scalable, single-record ACID guaranteed transactions, focus on performance and availability (CA mode, CP mode available in Enterprise edition)

- **Postgres**

Traditional relational database, over 30 years in development, reliable, robust and performant. Also other DB Support as well

The importance of the FINOS community

- **Leveraging Open Source**

Fundamental to the Genesis LCAP & Solutions

- **Contributing to Open Source**

We contribute to a variety of cross-industry Open Source initiatives

- **Contributing to FINOS Initiatives**

FDC3, Financial Objects, Cloud, Data Masking, etc...

THANKS, STAY SAFE & WELL!