Redis for the Enterprise

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Agenda

- Why Redis?
- Overview Redis Labs and Redis\textsuperscript{e}
- Road Ahead in 2017
  - Redis\textsuperscript{e} Flash
  - Geo Distributed Redis\textsuperscript{e}
  - Redis and Redis\textsuperscript{e} Modules
Why Redis?
Why Redis?

- High Performance
- Scalability
- Consistency Controls
- Flexibility
- Eviction Controls
- Durability
- Controls
- Messaging
- Rich Use Cases
- Pub Sub
- Caching
- Data Access
- Sorted Set
- Geo Spatial
- Exploiting Ram
- Session Store
- Rich Commands
- Notifications
- Easy Provisioning
- Realtime Analytics
- Exploiting CPU
Modelling Data == Modelling Interactions

Single Family vs High Rises
Hospitals vs Libraries
Theaters vs Shopping Malls
Data Modeling in Redis

Rich Structures  
- "Verbs" per Structures  
- Optimized Type Specific Processing  
- Native Extensibility (Modules)

as opposed to

Tables or Docs  
- Get/Set & Row Processing  
- Generalized Data Type Processing  
- Abstractions over built-in Core Types
Redis Labs – Home of Redis

The commercial company behind Open Source Redis

Provider of the Redis Enterprise (Redis®) technology, platform and products

- Founded in 2011
- HQ in Mountain View CA, R&D center in Tel-Aviv IL
Redis Labs Products

**SERVICES**

- **Redis® Cloud**
  - Fully managed Redis® service on hosted servers within AWS, MS Azure, GCP, IBM Softlayer, Heroku, CF & OpenShift

- **Redis® Cloud Private**
  - Fully managed Redis® service in VPCs within AWS, MS Azure, GCP & IBM Softlayer

- **Redis® Pack**
  - Downloadable Redis® software for any enterprise datacenter or cloud environment

- **Redis® Pack Managed**
  - Fully managed Redis® Pack in private data centers

**SOFTWARE**

- **RAM** & **Flash**
- **RAM** & **Flash**
- **RAM** & **Flash**
- **RAM** & **Flash**
Mature and Stable Technology & Products

230K+ DATABASES RUN OVER 3 YEARS

450 NEW DATABASES CREATED EVERY DAY

1,000+ CLOUD NODE FAILURE AND OUTAGES EVENTS SURVIVED WITH NO DATA LOSS

100+ MAN-YEARS OF ENTERPRISE REDIS TECHNOLOGY DEVELOPMENT

50+ DEDICATED REDIS ENGINEERS

13 GRANTED AND PENDING PATENTS
Fast Growing Business

Redis® Cloud

SERVICES

6800+
Enterprise Customers

SOFTWARE

Redis® Pack

60,000+
Total Customer Accounts

200+
Enterprise Customers
## Significant New Customer Wins

<table>
<thead>
<tr>
<th>Banks</th>
<th>Financial Services</th>
<th>Retail/E-commerce</th>
<th>Social</th>
<th>Media</th>
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<td>RingCentral</td>
<td>TripAdvisor</td>
<td>Roblox</td>
<td>Edgenuity</td>
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Redis\textsuperscript{e} Technology

Redis\textsuperscript{e} Cluster

- Shared nothing cluster architecture
- Fully compatible with open source commands & data structures
Road Ahead

Redis® 2017
Serving Larger Datasets with Redis® Flash

Geo Distributed Deployments with CRDTs

Native Extensibility with Modules
Redis\textsuperscript{e} Flash

Large Datasets with Near-Ram Latency at a Lower Cost

- Optimize read/writes with RAM-Extension approach
- Gain speed with smart caching between RAM and Flash
- Future proof for persisted-memory technology
Why Redis® Flash?

Serve large datasets at a much lower cost

70%

Lower Cost with RAM+Flash Compared to all-in-RAM
## Redis-on-Flash vs Disk Based Databases?

<table>
<thead>
<tr>
<th></th>
<th>Redis on Flash</th>
<th>Disk Based Databases</th>
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</thead>
<tbody>
<tr>
<td><strong>Hot Value Handling</strong></td>
<td>No IO Required&lt;br&gt;Keep hot values in RAM</td>
<td>Heavy IO Required&lt;br&gt;Keeps writing to disk</td>
</tr>
<tr>
<td><strong>Write Performance</strong></td>
<td>Faster Writes&lt;br&gt;Non-Durable Writes with Ram Extension approach</td>
<td>Slower Writes&lt;br&gt;Durable Writes (WAL, Redo logs etc)</td>
</tr>
<tr>
<td><strong>Data Size on Flash</strong></td>
<td>Smaller data footprint&lt;br&gt;flash store only data that spill from RAM</td>
<td>Larger data footprint&lt;br&gt;flash store all data in ram as well as data spilling from RAM</td>
</tr>
</tbody>
</table>
Serving Larger Datasets with Redise Flash

Geo Distributed Deployments with CRDTs

Native Extensibility with Modules
Geo Distributed Redis

ReplicaOf (Available Today)
Geo Distribution for Local Data Access (CDN Like)
Geo Distributed Redis

Conflict Free Replicated Data Types a.k.a CRDTs (Coming Soon)
Geo Distribution for Active-Active Writes
With Smart Conflict Resolution
Why CRDTs?

• **Fraud Detection**
  - Geo Distributed Event Tracking
    *Sets Gathering Geo Distributed Events*

• **Social Engagement Apps**
  - Encoding Social Engagement
    *Distributed Counters for “Likes”, “Shares”, “Retweets”*

• **Collaboration Apps**
  - Constructing Smart Timelines
    *Merged Lists Ordering Posts*
  - Instant Messaging & Conversation Tracking
    *Merged Lists Ordering Conversations*

• **Geo Distributed Trading/Bidding**
  - Auctions, Bids/Asks
    *Lists/Sorted Sets tracking Bids and Asks*

• **Dashboards & Scoreboards**
  - Tracking Geo Distributed Scoreboards
    *Sorted Sets tracking ordered scores*

• **Real-time Metering Apps**
  - Tracking Usage/Consumption
    *Sets/Lists Tracking Consumption Events*
Learn More - CRDTs

11:40 - Master-Master Replication in Redis with CRDTs - Yossi Gottlieb
Serving Larger Datasets with Redise Flash

Geo Distributed Deployments with CRDTs

Native Extensibility with Modules
Modules: A Revolutionary Approach

Adapt your database to your data, not the other way around

- **Neural Redis**
  - Simple Neural Network Native to Redis

- **ReJSON**
  - JSON Engine on Redis. Pre-released

- **Rate Limiter**
  - Based on Generic Cell Rate Algorithm (GCRA)

- **Redis-ML**
  - Machine Learning Model Serving

- **Time Series**
  - Time series values aggregation in Redis

- **Crypto Engine Wrapper**
  - secure way to store data in Redis via encrypt/decrypt with various Themis primitives

- **RediSearch**
  - Full Text Search Engine in Redis

- **Graph**
  - Graph database on Redis based on Cypher language

- **Secondary Index/RQL**
  - Indexing + SQL-like syntax for querying indexes. Pre-released
Learn More - Modules

12:25 - A Year of Modules - Dvir Volk

14:30 - Redis Graph – New Module - Rio Lipman

16:25 - ReJSON – {“id”:”old dog”, “activity”:”new trick”} - Itamar Haber