



## Unlocking Global Resilience *using* Cloud Native Distributed Datastore

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Mary Grygleski  
Director of Emerging Technologies @ Callibrity  
X @mgrygles

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# Challenges in Modern Data Management

- Increasing data volume and velocity
- Growing global user base and distributed applications
- Need for real-time data processing and analysis
- Complexity of managing multiple regions and data centers

# In The Current Modern Connected World...

- Increasing data volume and velocity from regional to global operations
- Support of multiple regional and national languages
- Need for real-time data processing and analysis \*across regions\*
- Complexity of managing multiple regions and data centers
  - Potential need to comply with regional/national data regulations (e.g. GDPR in EU)
- Concerns for high availability and disaster recovery

# Selection Criteria for the Data Practitioner

- Open, Distributed SQL database with native multi-region support
  - Speed and Performance all within acceptable range
- Seamlessly replicates data across regions for high availability and fault tolerance
- Handles massive workloads with horizontal scalability
- Strong security features for data protection

# YugabyteDB – Beyond the "Ordinary"

- Low Latency
  - Data stored closer to users for faster application performance
- Regional Compliance
  - Store sensitive data within specific regions
- Business Continuity
  - Minimize downtime and disruptions with automatic failover
- Global Growth
  - Easily expand your database footprint without major infrastructure changes

# YugabyteDB – Multiple "Facets"

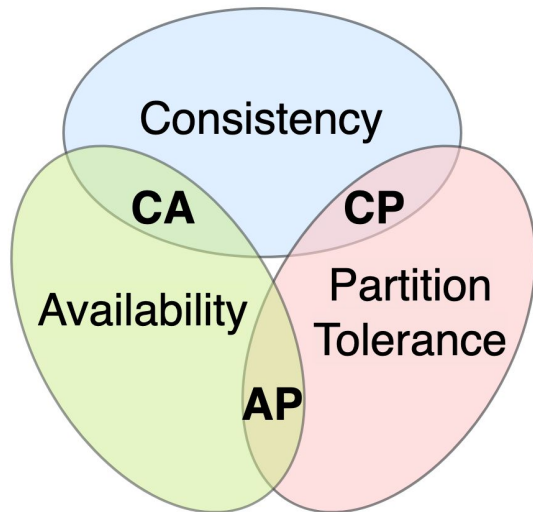
- YugabyteDB flavors:
  - YugabyteDB – open source
  - YugabyteDB Anywhere – self-hosted DB on the cloud
  - YugabyteDB Aeon – managed cloud (AWS, Azure, GCP)
- API Support:
  - SQL (YSQL)
  - NoSQL (YCQL - \*Cassandra CQL)
- 100% Compatible with (wire-protocol level and runtime)
  - PostgreSQL

# YugabyteDB – Multiple Languages Support

- Smart Driver has multiple language interfaces:
  - Java
  - Python
  - Node.js
  - Go
  - C#
  - Rust

# YugabyteDB and the CAP Theorem

- Partition Tolerance is high
- Consistency is high
  - Raft consensus protocol
- Availability is near perfect





Key Insights

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# Key Features for Modern Data Management and System Design

# Architectural Principles of Cloud-Native Distributed Databases

- Resiliency comes first!
    - Redundancy
    - Multi-regional Deployments
    - Data Replication
  - Scalability
    - System is multi-component based / Microservices-based
  - Infrastructure Automation is very important
  - Latency plays a part
  - Backups keep data data safe
  - Security
- ➡ Transparency should be part of system design

# Be Prepared for the Future of Data

- Distributed SQL for scalability and performance
- Multi-region replication for high availability and disaster recovery
- ACID transactions for data integrity
- Flexible deployment options: cloud, on-premise, hybrid
- Strong security features: encryption, access control
- Flexibility for Growth: GenAI and LLM Integrations

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# Resources

## Yugabyte Multi-Region Deployments:

<https://docs.yugabyte.com/preview/explore/multi-region-deployments/>

## Resiliency, High Availability, Fault Tolerance:

<https://docs.yugabyte.com/preview/explore/fault-tolerance/>

*Yugabyte and the Raft Protocol:*

<https://docs.yugabyte.com/preview/architecture/docdb-replication/raft/>

## Tutorial Suggestions from Yugabyte (The YugaPlus Streaming Platform):

<https://docs.yugabyte.com/preview/tutorials/build-and-learn/>

*Parts 3 & 4 zoom in on building resiliency and geo replication:*

- <https://docs.yugabyte.com/preview/tutorials/build-and-learn/chapter3-tolerating-outages/>
- <https://docs.yugabyte.com/preview/tutorials/build-and-learn/chapter4-going-global/>

# Follow Mary's Stream

[Different topics: GenAI/ChatGPT, Java, Python, JS/TS, Open Source, Distributed Messaging and DataStore, Event-Streaming, Cloud, DevOps, etc]

**Wed|Thurs|Fri-afternoon-US/CST**



<https://twitch.tv/mgrygles>

<https://youtube.com/@marygrygleski9271>

# Let's Build Your Data Future Together

- Contact us for a free consultation and demo of the YugabyteDB Aeon.
- Explore our partner ecosystem for specialized consulting services.
- Visit our website for more information and resources:  
<https://www.callibrity.com>



# THANK YOU

*Mary Grygleski*

**in** <https://www.linkedin.com/in/mary-grygleski/>

 <https://discord.gg/RMU4Juw>

