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# Managing Edge Computing with Serverless

Lev Radomislensky, Iguazio



#### Current Approaches are Problematic



- Run apps locally in a traditional IT approach
- Requires local IT staff
- Hard to manage and update across branches -
- Combining data between apps in complex

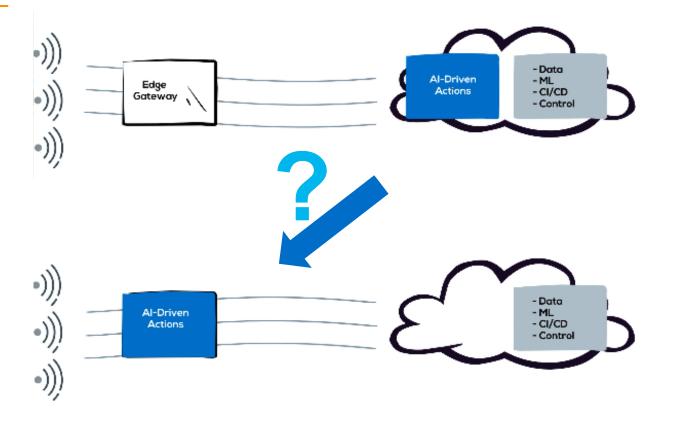


- Send all the data to the cloud and run all apps there
- Bandwidth limitations
  - Intermittent connectivity
- Latency problems

#### A true hybrid approach is needed with an intelligent edge

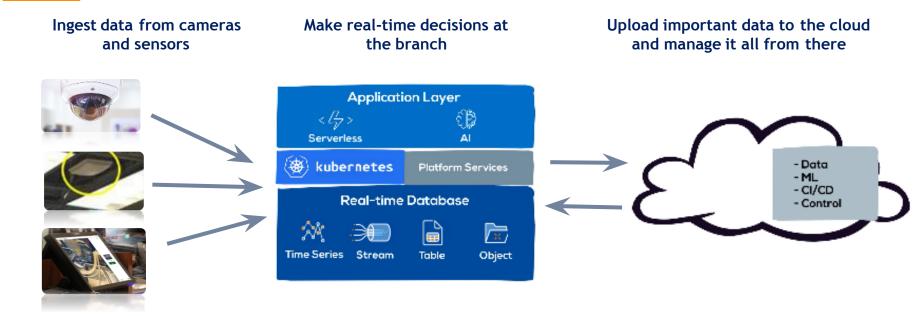


#### What Does it Take to Move Intelligence to the Edge?





## Serverless at the Intelligent Edge



- High-performance pipeline from events to responses, predictions and dashboards
- Simpler deployment and upgrades through integrated apps, AI and data access
- "Set-top box" federated architecture allowing to place apps close to data sources

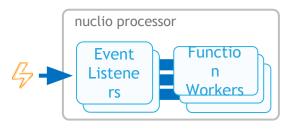
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### But, Serverless Comes with Challenges

- Slow performance, lack of concurrency
- Stateless, limited application patterns
- Limited number or cloud specific event sources
- Hard to debug, diagnose and build dependencies
- Cloud vendor API lock-in



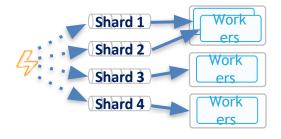




- Non-blocking, parallel
- Zero copy, buffer reuse
- Up to 400K events/sec/proc
- **GPU** Support

#### Advanced Data & Al Features

Nuclio: Taking Serverless to the Next Level



- Auto-rebalance, checkpoints
- Any source: Kafka, NATS, Kinesis, eventhub, iguazio, pub/sub, RabbitMQ, Cron, ...
- Jupyter, Spark, Rapids integration

#### **Statefulness**



- Data bindings
- Shared volumes
- Context cache н.

**Open-source** Serverless for compute and data intensive tasks, **100x faster** than AWS Lambda !



### Best Match: Serverless + Kubernetes



- Abstraction: auto generated code, Docker files and YAMLs
- Automated dev & ops flow, observability
- Maximizing performance and resource efficiency
- Everything is a Kubernetes resource



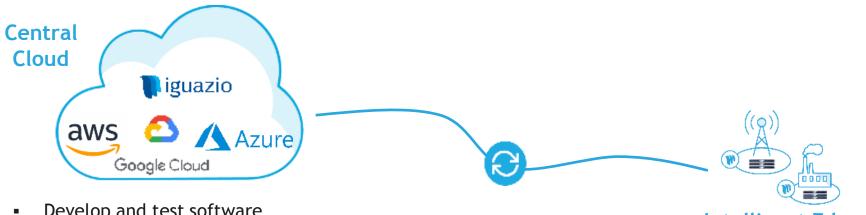
- Cloud independent APIs, on-prem, edge
- Auto-scaling and abstract infrastructure
- One platform for serverless and containers



- "Serverless" data services
- Endless scalability



#### Run Anywhere, Automate Data and Workload Movement



- Develop and test software
- Machine learning
- Data aggregation and archiving
- Central control and monitoring

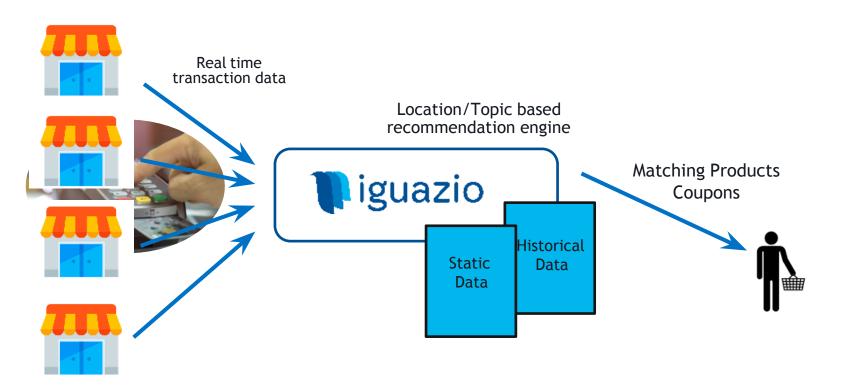
Watch Iguazio-Google Intelligent edge video at: https://www.youtube.com/watch?v=ZMnZNh5XBOs

#### Intelligent Edge

- Deploy software + ML models
- Automate data movement
- Monitor and collect telemetry ٠

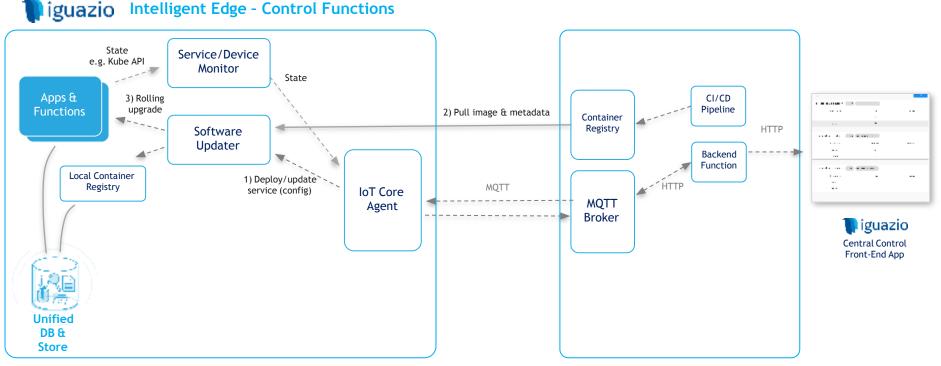


Success story - credit card company Real-time location based recommendation engine



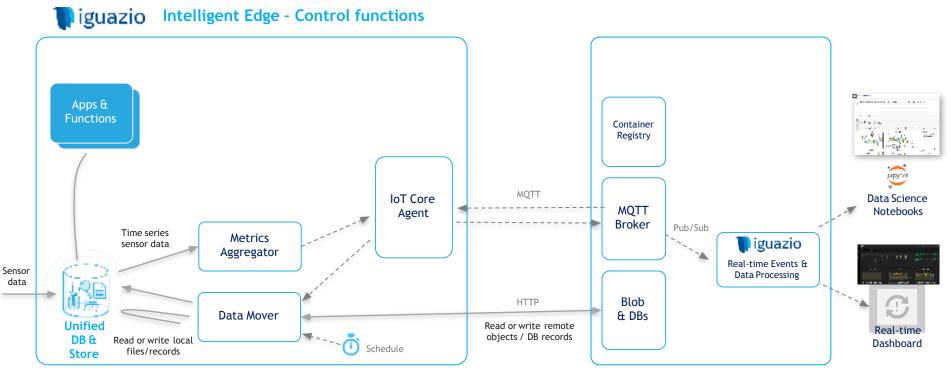


### **Demo: Control Flow Details**



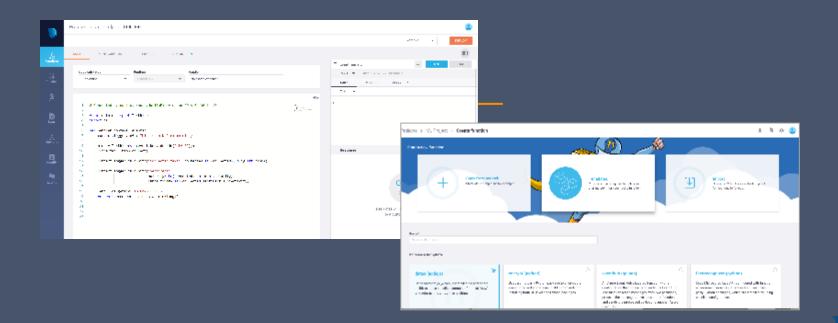
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#### Demo: Data Movement & Analysis Flow Details





## Demo: Build & Test an App in 2 min





### Simple Configuration UI (Over MQTT Broker)

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### Real-time Aggregation Dashboard (Grafana)

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Using iguazio real-time KV and Time-series DB in the

cloud

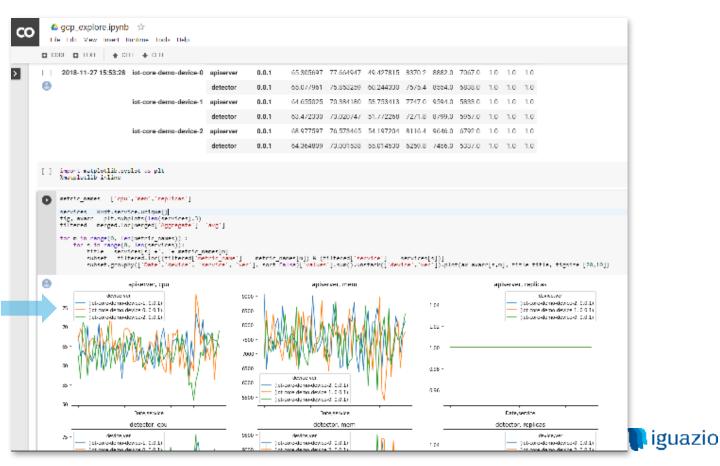


#### Interactive Data-Science Workbench on Real-time Data



Using Google Collaboratory Service (Jupyter)

Data served by iguazio realtime analytics & TSDB solution





#### Serverless is the Optimal Solution for the Edge

- Enrich data, take actions and persist the information within the database
- Accelerate application performance (400k events/ sec/proc, 0.1ms latency)
- Cut dev and ops overhead, shorten time to production and reduce costs

