



OPENWORKS

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HOW HUGHES ACHIEVED SCALABILITY AND HA FOR ITS IOT SMART PLUG WITH SKYSQL + XPAND

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AGENDA

- General business need for IoT solutions
- How Xpand meets requirements for IoT applications
- Hughes' problem and why did it needed to be solved
- Overview of solution with Xpand
- How Xpand meets Hughes business and technical goals
- Near and long-term plans
- Q&A

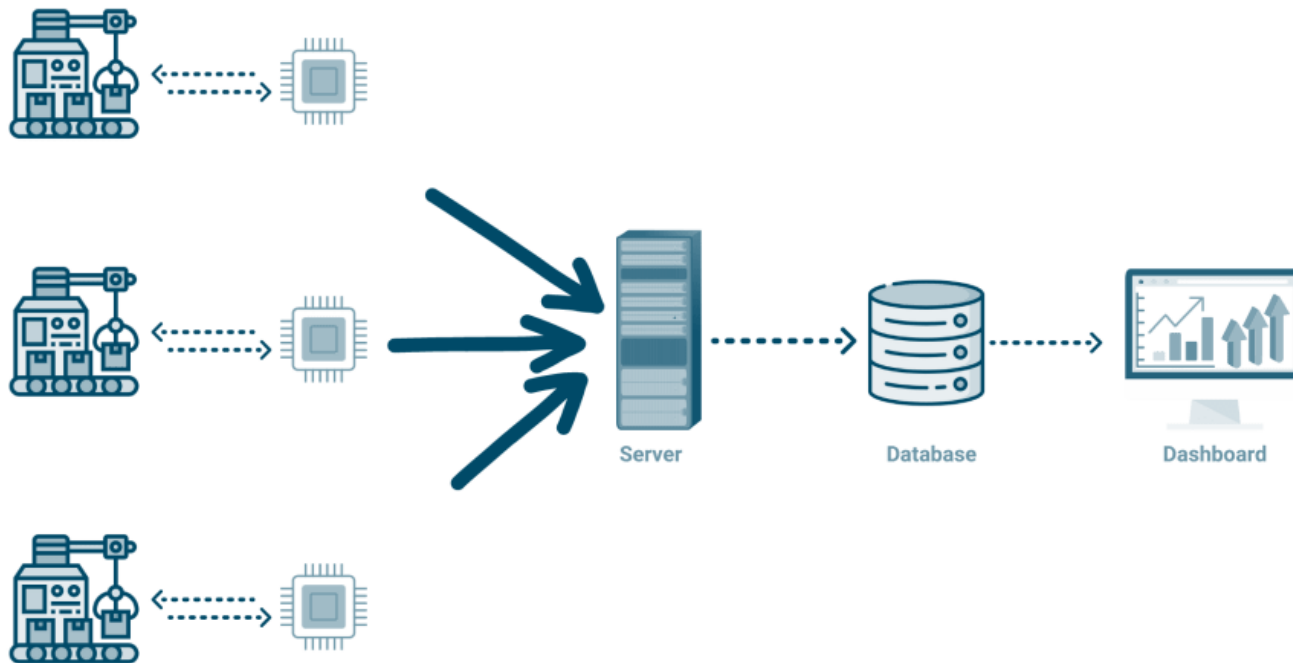
GENERAL BUSINESS NEED FOR IOT SOLUTIONS

Generated by Midjourney



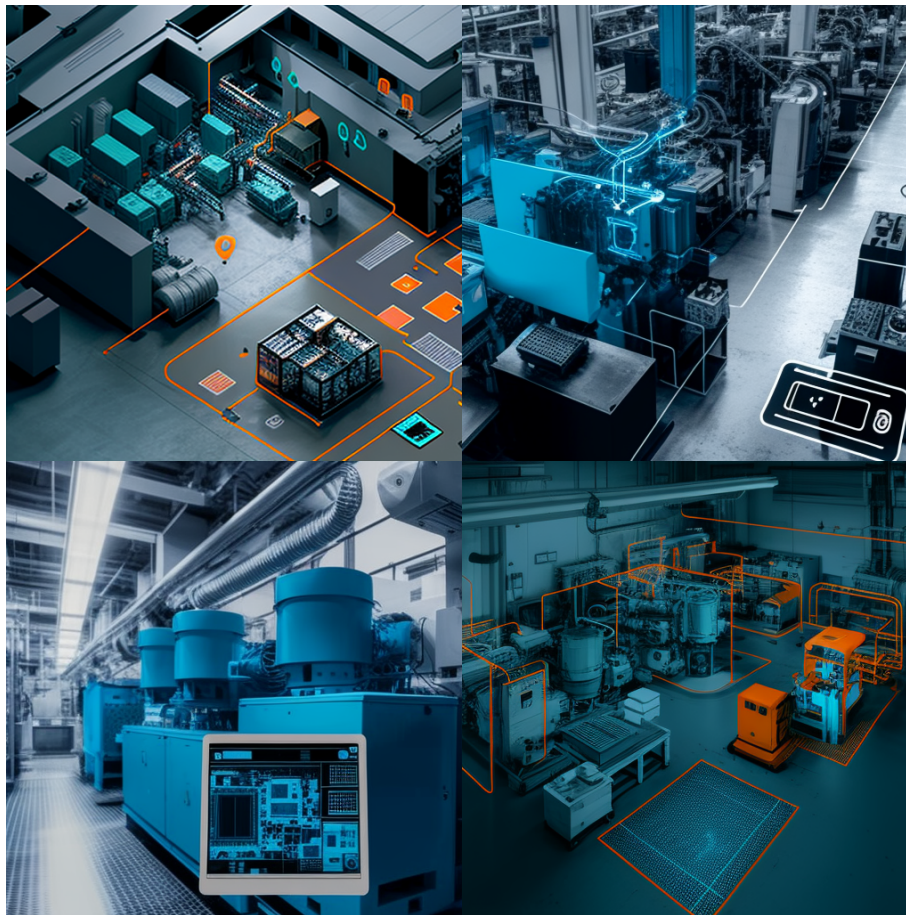
Prompt was /imagine caricature cartoon of baby robotcop

PREDICTIVE MAINTENANCE

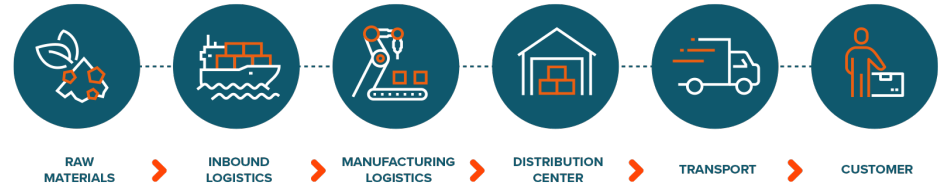


*Image From <https://dev.to/josethz00/learn-iot-from-scratch-7-best-databases-for-iot-5511>

PREDICTIVE MAINTENANCE



SUPPLY CHAIN

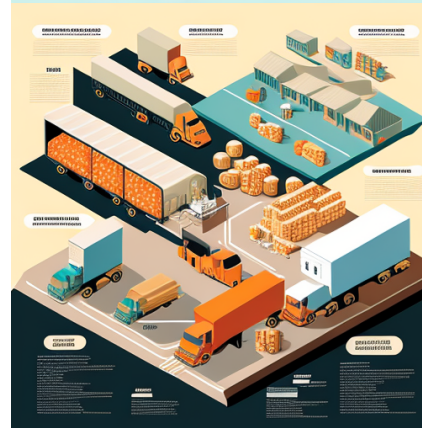
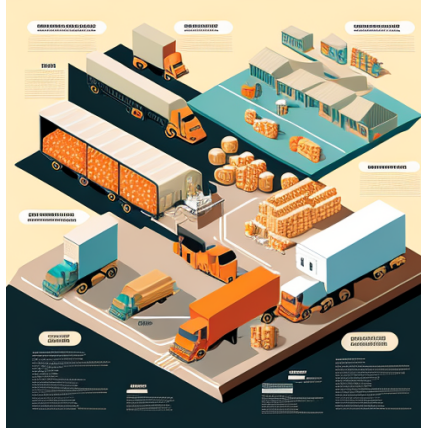


Data Labs India enable organizations to embrace digital transformations and achieve business excellence

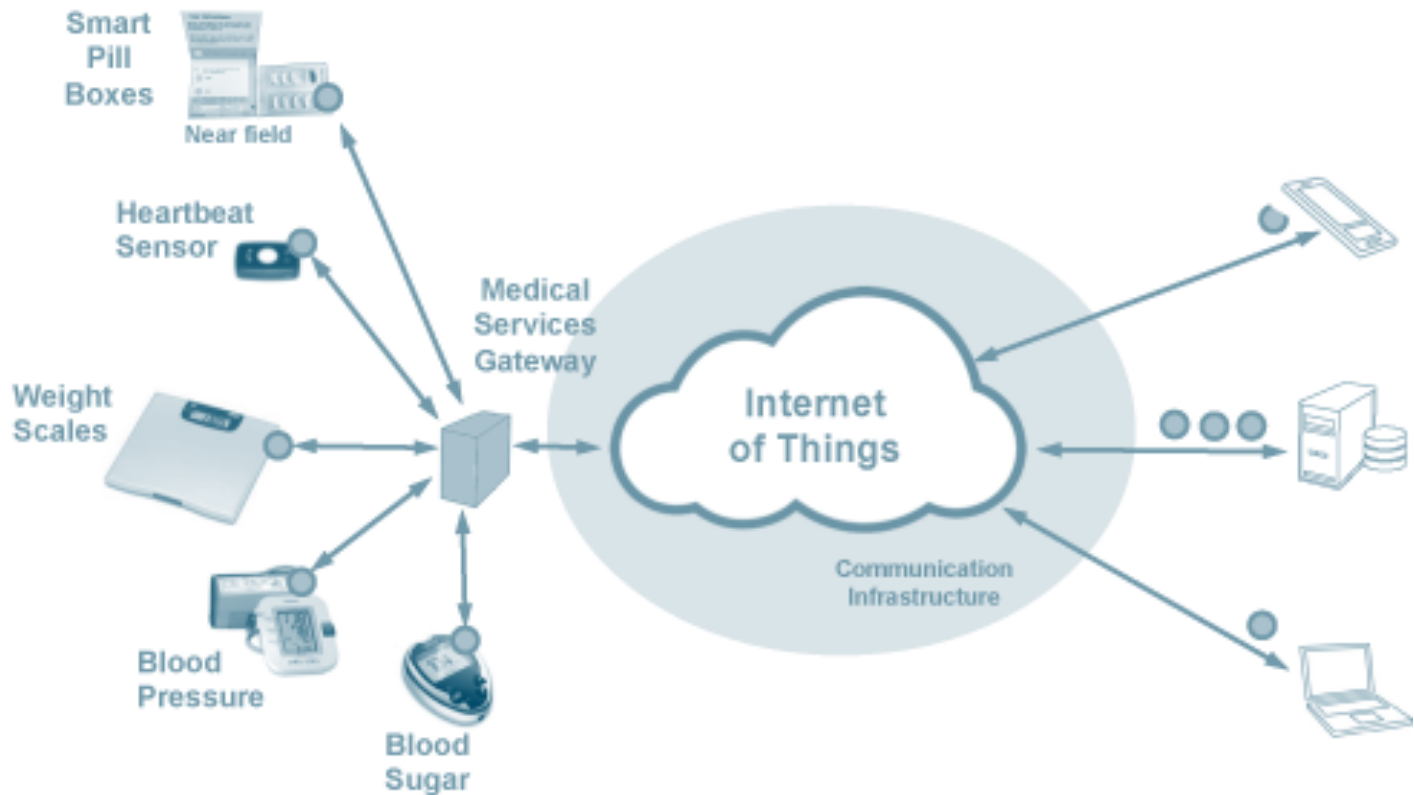
For More Details
info@datalabsindia.com
www.datalabsindia.com



SUPPLY CHAIN



PATIENT CARE



*Image From <https://www.eclipse.org/proposals/technology.mihini/>

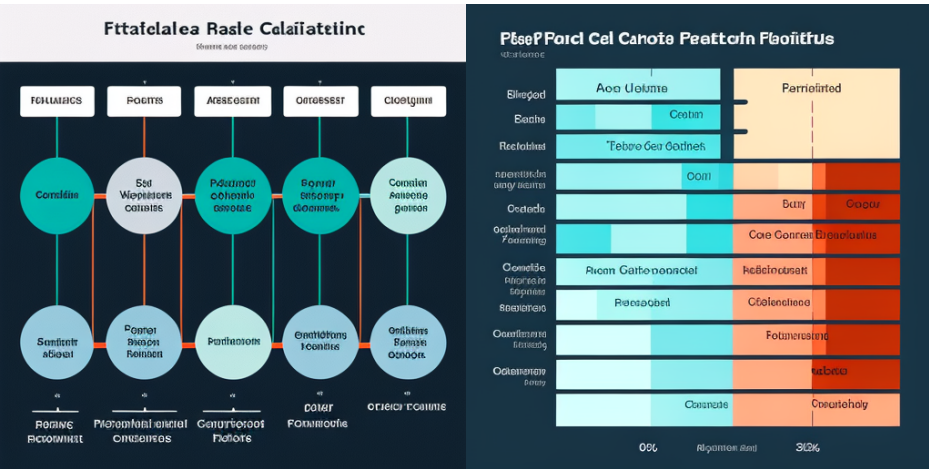
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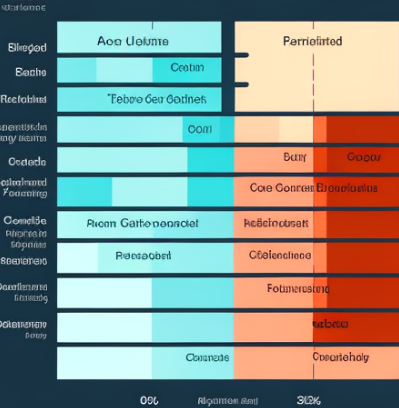
FRAUD DETECTION



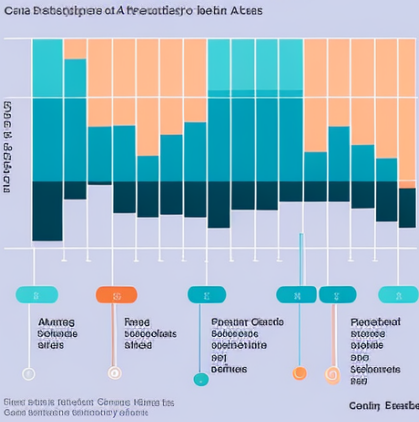
FRAUD DETECTION



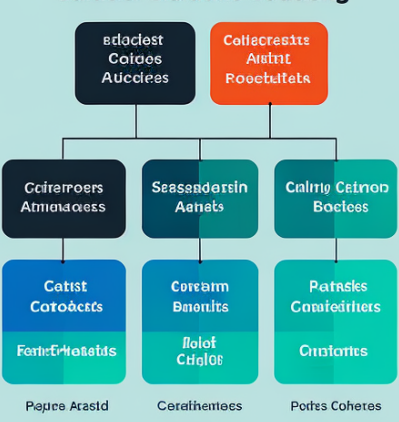
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HOW XPAND MEETS REQUIREMENTS FOR IOT APPLICATIONS

XPAND/MAXSCALE TOPOLOGY – MULTI-ZONE

HIGH AVAILABILITY

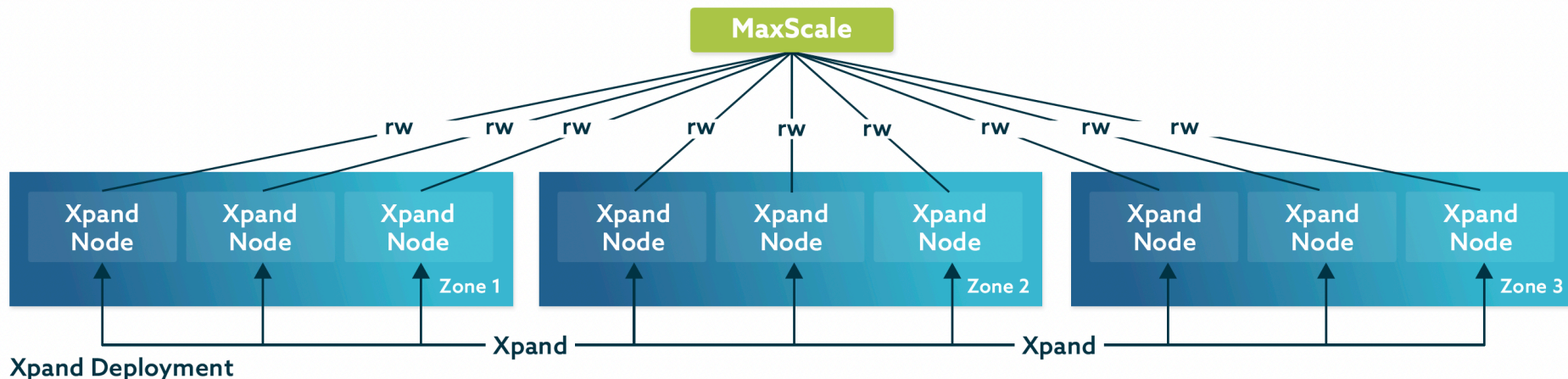
- Automatic failover
- Connection migration
- Session restore
- Transaction replay

SCALABILITY

- Load balancing
- Read/write splitting
- Causal reads
- Query result caching

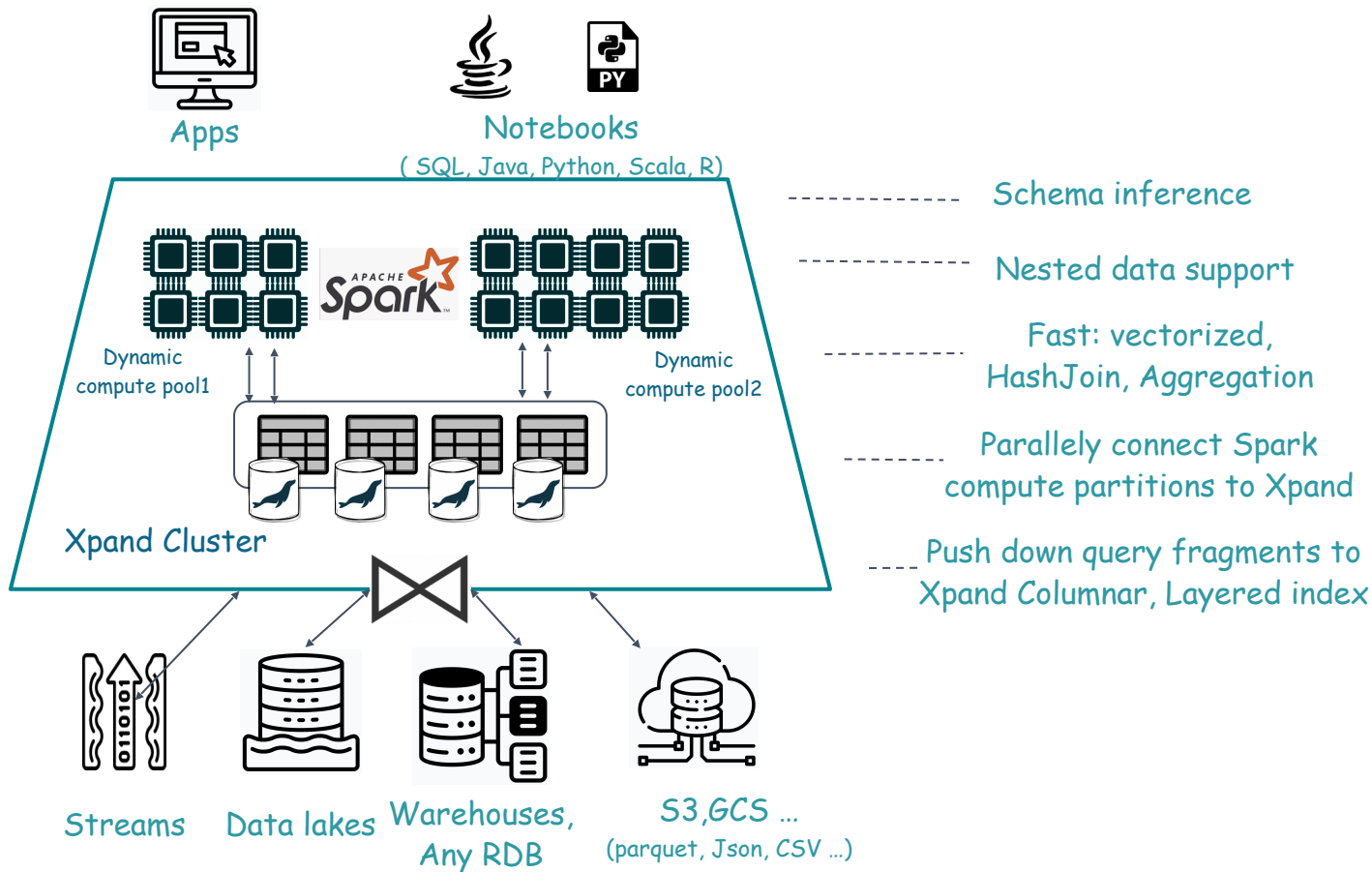
SECURITY

- Database firewall
- Dynamic data masking
- Query throttling
- Query result limiting

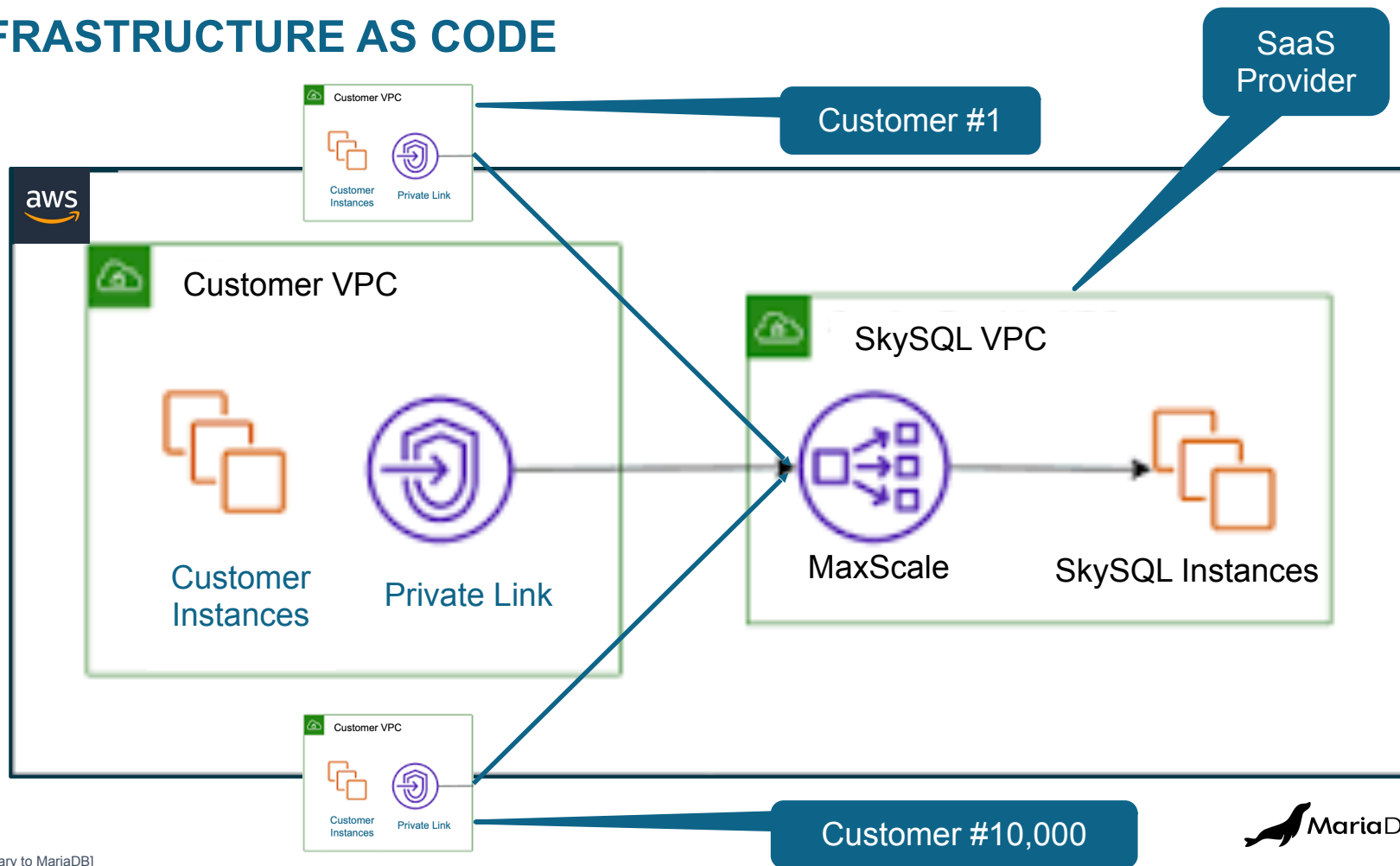


Xpand Performance Topology – Multi-Zone

Any Data Source, Format and Feature Rich

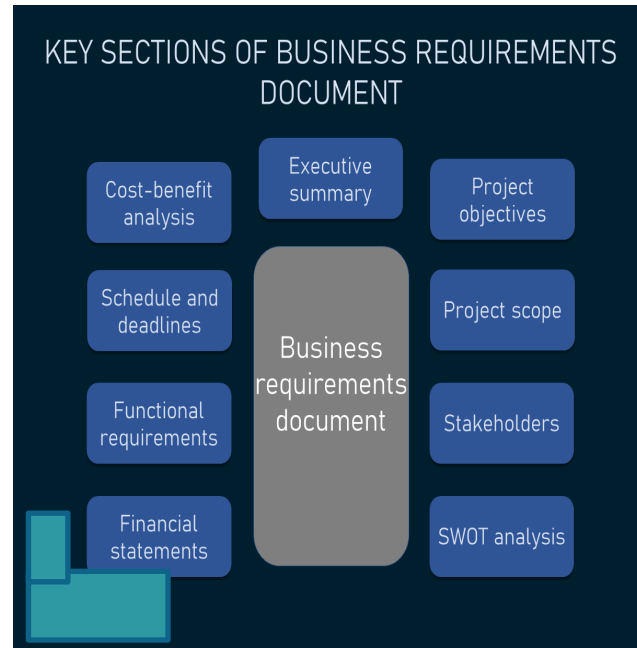


INFRASTRUCTURE AS CODE



Wrap Up

- Constant change in business requirements
- New opportunities, technology, competition, regulations, customer requirements
- Need scale, data integration, real time analytics
- Need Reliable, Repeatable, Reusable
- Need DB that integrates and analyzes data
- Infrastructure as Code





ACTIVE POWER EDGE



HUGHES PROBLEM AND WHY IT NEEDED TO BE SOLVED

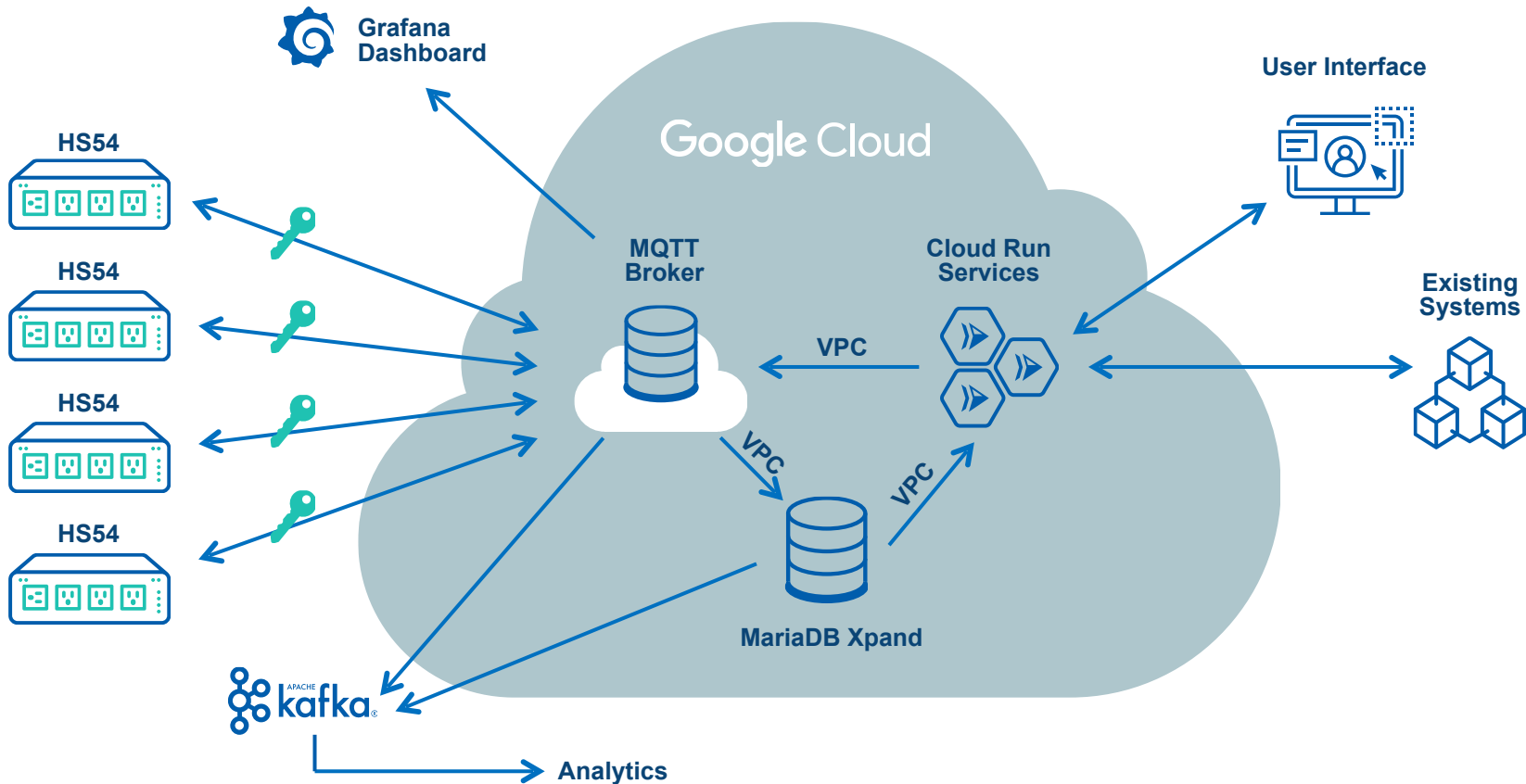
PROBLEM TO SOLVE

- **REDUCE** the number of support calls to / from a remote site. How?
 - By detecting when a remote network-critical device stops working
 - Automatically rebooting the problem device
 - If all that device needed was a reboot, the HS54 just paid for itself!
- **Give support staff the ability to SEE things on the remote network. How?**
 - Show how much power devices are using in each outlet
 - If you know how much power a specific device uses, you have a good idea if the device is at least plugged in and working.
 - Example: No power draw on outlet #2? Check that device is plugged in.
- **Give support staff the ability to DO things on the remote network. How?**
 - Remotely reboot devices connected to the Active Power Edge from HughesON Portal
 - The ability to run simple network checks (ping) on the remote network from the HughesON Portal



OVERVIEW OF SOLUTION WITH XPAND

OVERALL ARCHITECTURE



MQTT

- **What is MQTT?**
- **Advantages**
 - Reliable
 - Scalable
 - High Performance
 - Secure
- **Popular MQTT Brokers**
 - Eclipse Mosquitto, EMQ X, Mosca
- **MQTT On Google Cloud**
 - ClearBlade
- **MQTT Topics**
 - `$share/ape/device/heartbeat/+`
- **Shared Subscriptions**

GC CLOUDRUN

- **What is CloudRun?**
 - Serverless Container
 - Managed load balancing
- **Advantages**
 - Language agnostic
 - Easy to implement
 - Auto Scaling
 - Reliable
- **Keep in mind**
 - Must leverage stateless logic

BUSINESS and TECHNICAL GOALS

BUSINESS

- Reduce cost of maintenance
- Increased revenue from enhanced customer experience
- New opportunities from greater brand awareness and analytics

TECHNICAL

- Scale to accommodate increased load
- Integrate with analytical tools
- Preventative maintenance from alerts and analytics

NEAR AND LONG-TERM PLANS

NEAR TERM PLANS

- Increase # of Smart Power Plugs to 10,000 by end 2023
- Migrate to latest SkySQL for new features (autoscale, multi-cloud, serverless analytics)

LONG TERM PLANS

- Increase # of Smart Power Plugs to 1M+ devices
- Leverage analytical capabilities of Xpand
- On board new products

WHAT WE COVERED

- IoT applications are growing and becoming increasingly important across industries
- Enterprises are compelled by necessity and opportunity to rapidly extract value from IoT data
- SkySQL and Xpand deliver a platform ideally suited for managing and leveraging IoT data

NEXT STEPS

Check out these sources to learn more about MariaDB.

- Check out the [MariaDB Enterprise Server Datasheet](#)
- For migrating to SkySQL, check out the [MariaDB SkySQL Lift and Shift Migration whitepaper](#)
- To learn more about Xpand, please check out the following OpenWorks breakout:
 - [MariaDB Xpand Under the Hood: From Architecture to Reality](#)



THANK YOU



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