
AWS
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NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

DAT215

Samsung SmartThings powers home automation with Amazon MemoryDB

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Agenda

What is SmartThings?

Core requirements of a home IoT platform

Where we are and where we are going

Why SmartThings chose Redis and Amazon MemoryDB for Redis

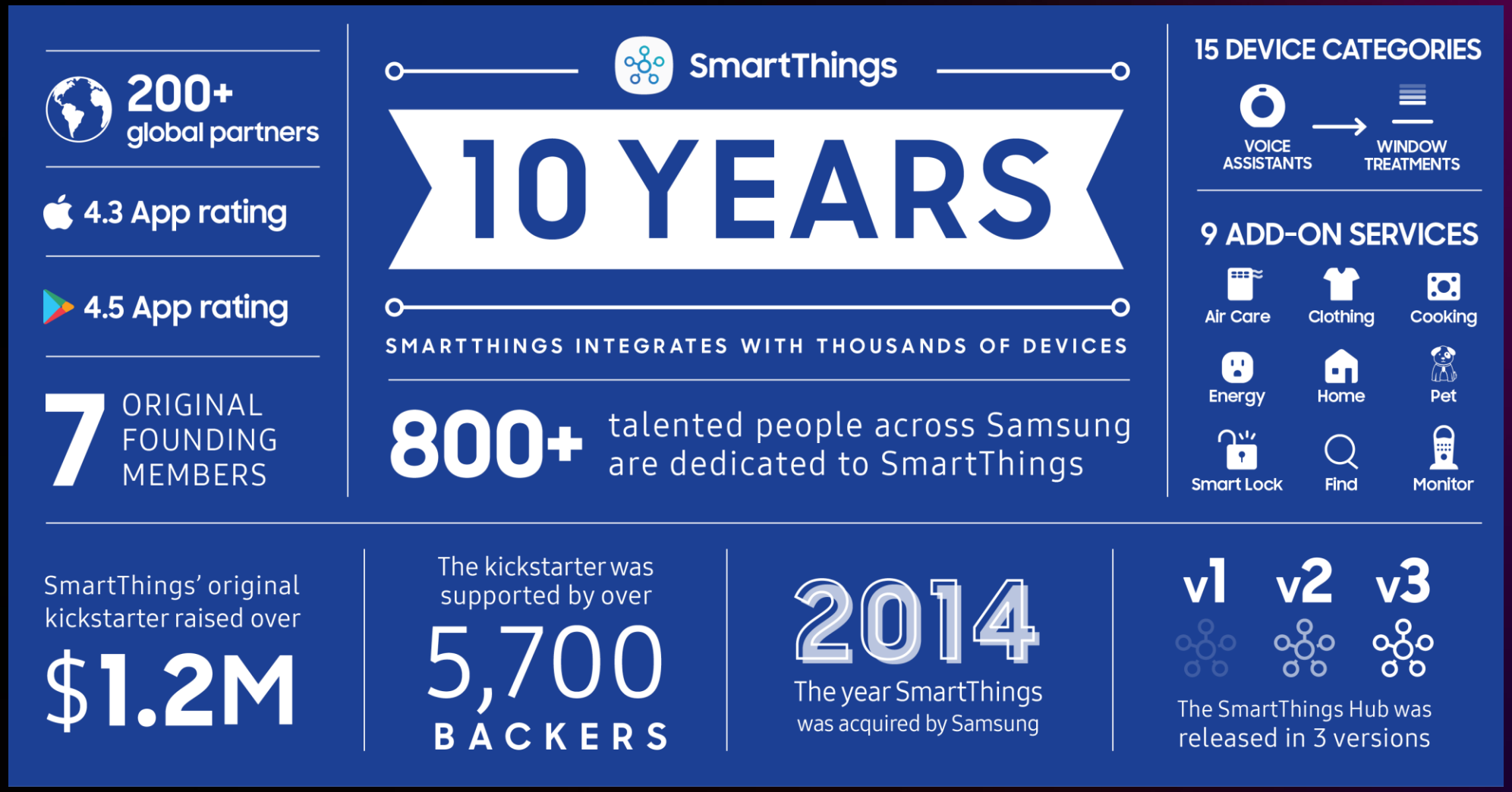
What is MemoryDB?

SmartThings new architecture

Q&A

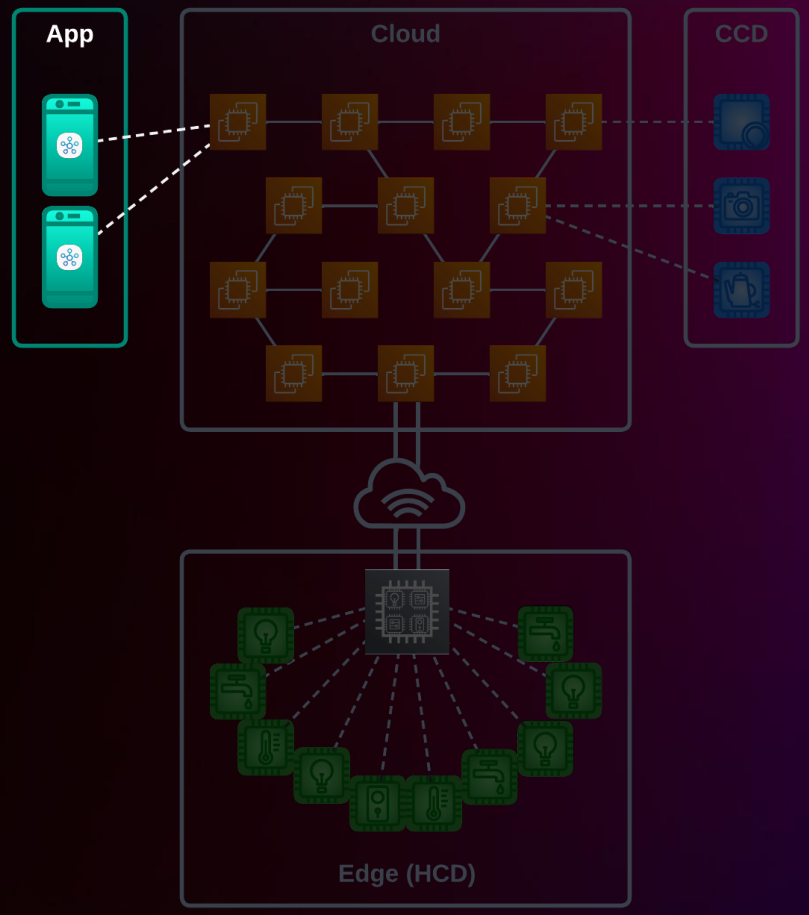

My home
Favorites
30°
My home
Updated: 16:20
Living room
Hub
Connected
Living room
Outlet
Off
The Weather Channel
Updated: 16:19
Favorites
Devices
Life
Automations
Menu

About SmartThings



SmartThings ecosystem

- **SmartThings app**
  - User experience



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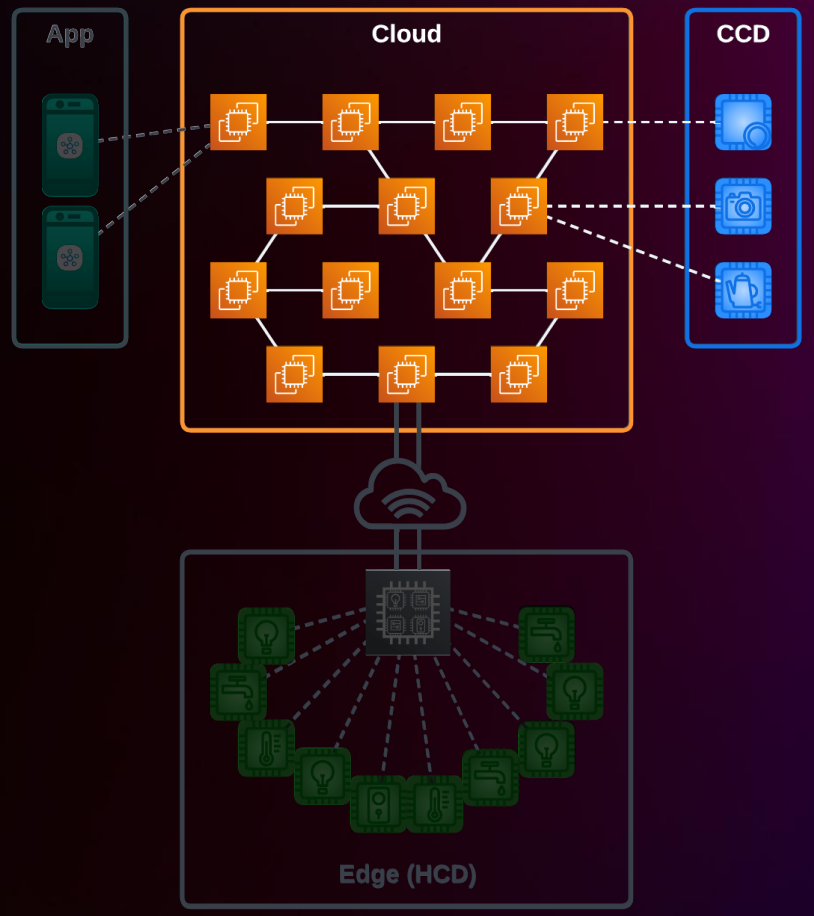
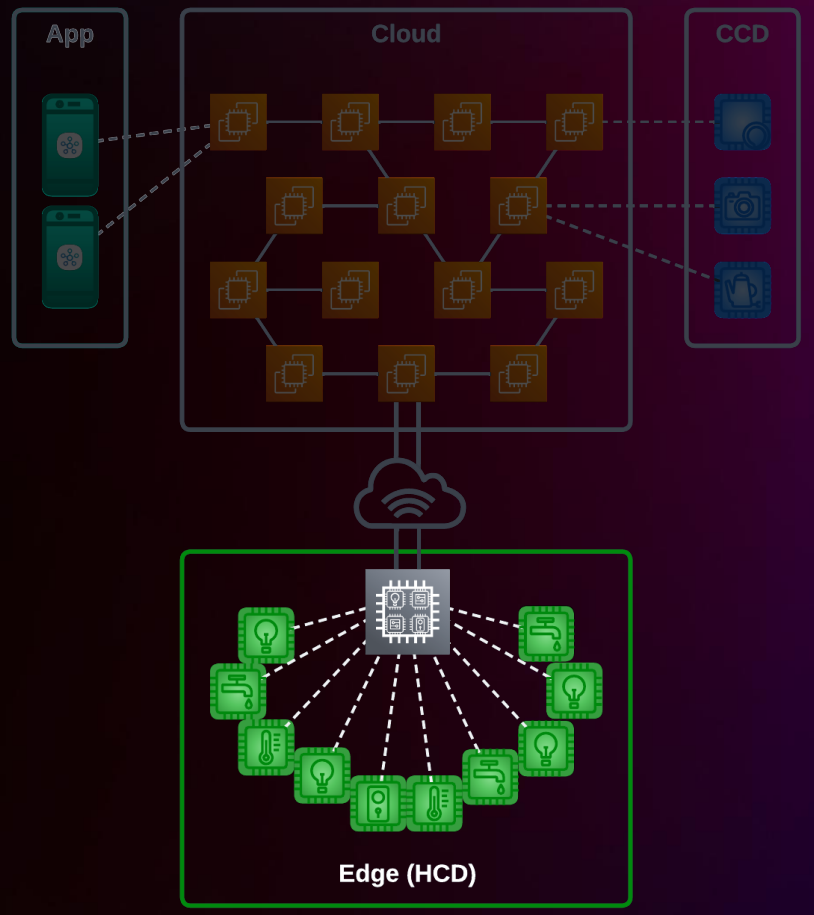
  - Cloud-connected devices (CCD)
  - Automations



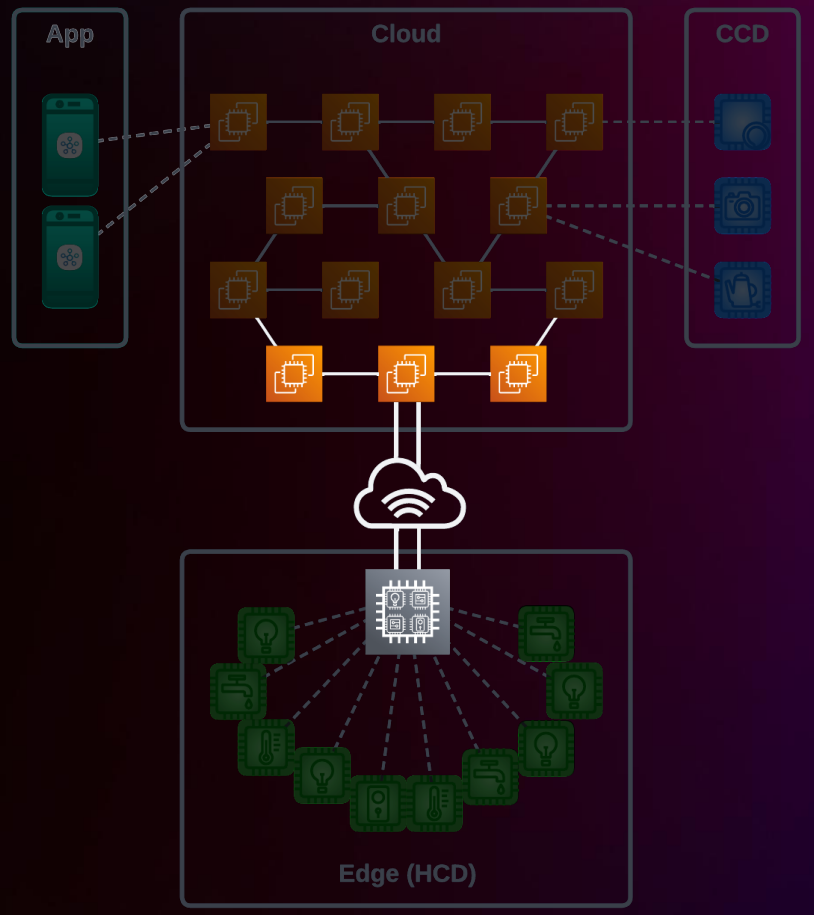
SmartThings ecosystem

- **SmartThings app**
  - User experience
- **SmartThings cloud**
  - Cloud-connected devices (CCD)
  - Automations
- **SmartThings edge**
  - Hub-connected devices (HCD)
  - Automations



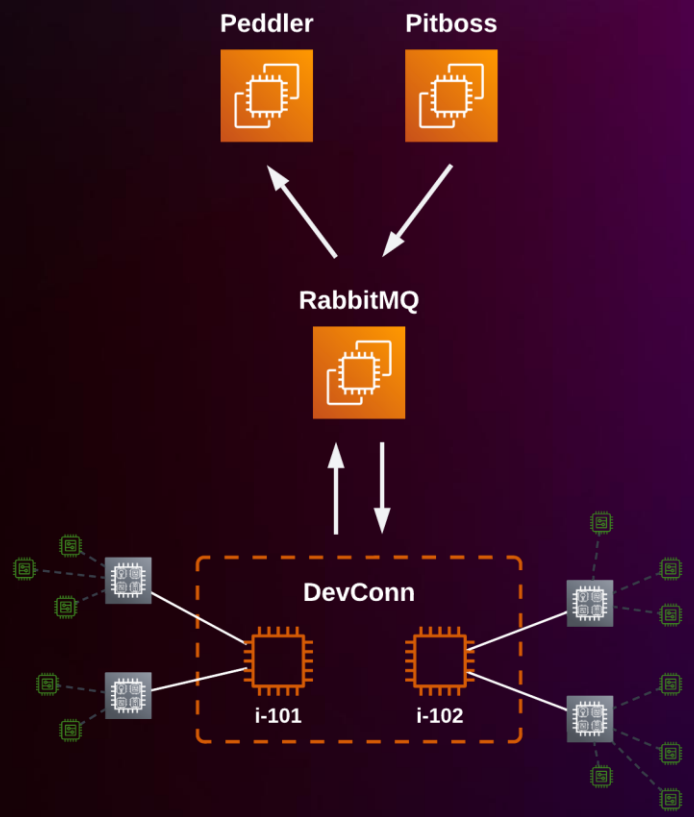
SmartThings ecosystem

- **SmartThings app**
  - User experience
- **SmartThings cloud**
  - Cloud-connected devices (CCD)
  - Automations
- **SmartThings edge**
  - Hub-connected devices (HCD)
  - Automations
- **Hub Connectivity Platform**
  - Bridge between cloud and edge



Hub Connectivity Platform

- Hundreds of thousands of hub connections
  - Long-lived connections
  - Custom binary data format
- Bidirectional communication
- One of the oldest parts of SmartThings



Hub Connectivity Platform 1.0

- Shard architecture
- Aging infrastructure
- Growth outpacing architecture

Core principles

Ultra-fast performance

Reliable

Scalable

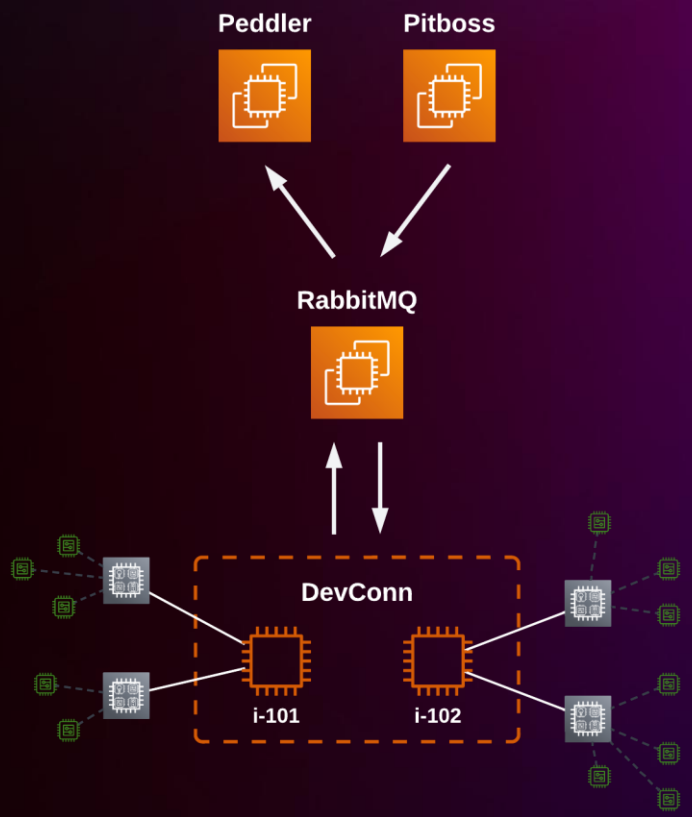
Easily maintainable

Hub Connectivity Platform 1.0

CORE PRINCIPLES CHECKLIST

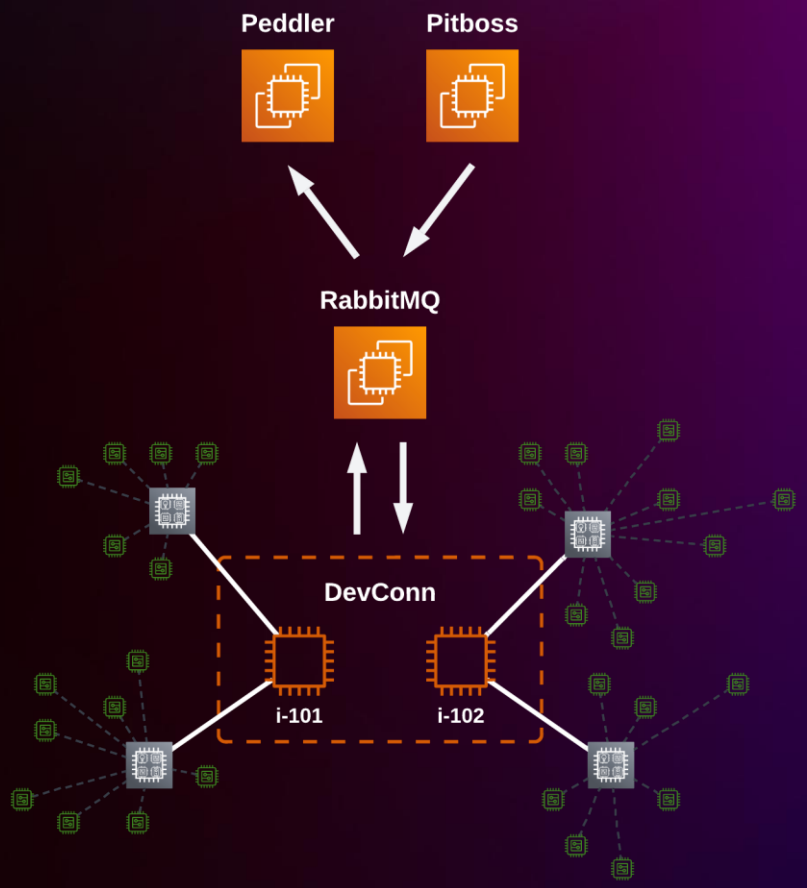
	Natural growth		
Low latency	Pass		
Reliable	Depends		
Scalable	Barely		
Maintainable	Fail		

Future of home IoT



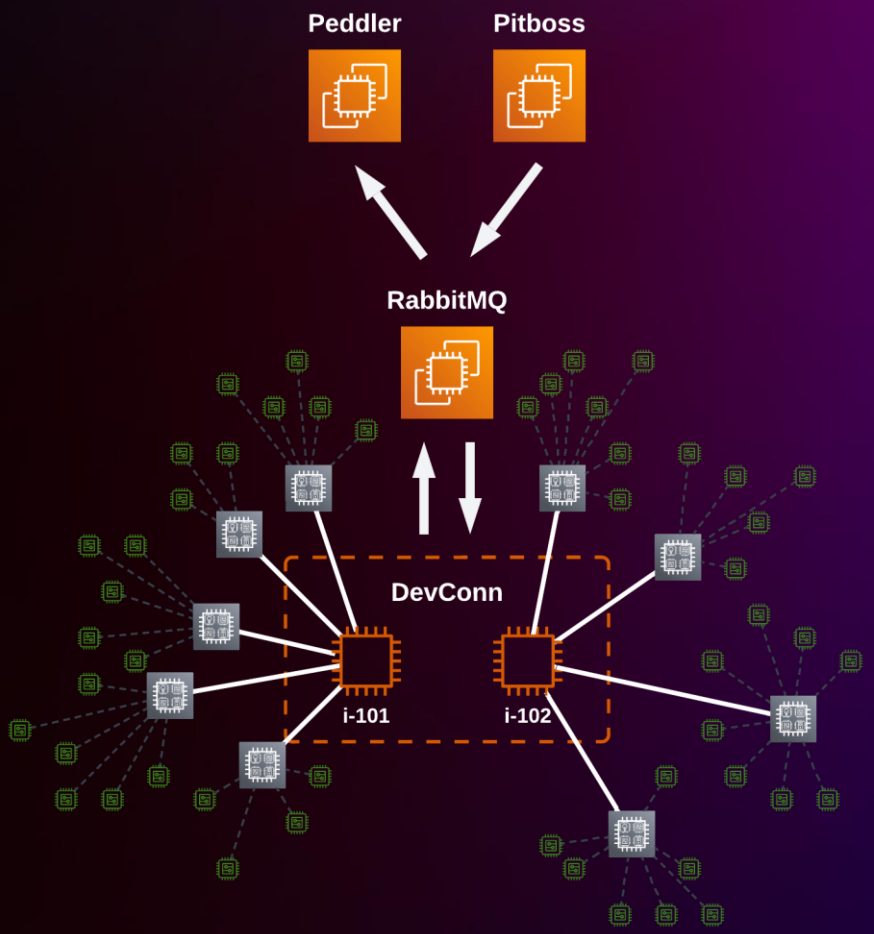
Future of home IoT

- Matter
  - Billions of devices by 2030
  - More devices per hub



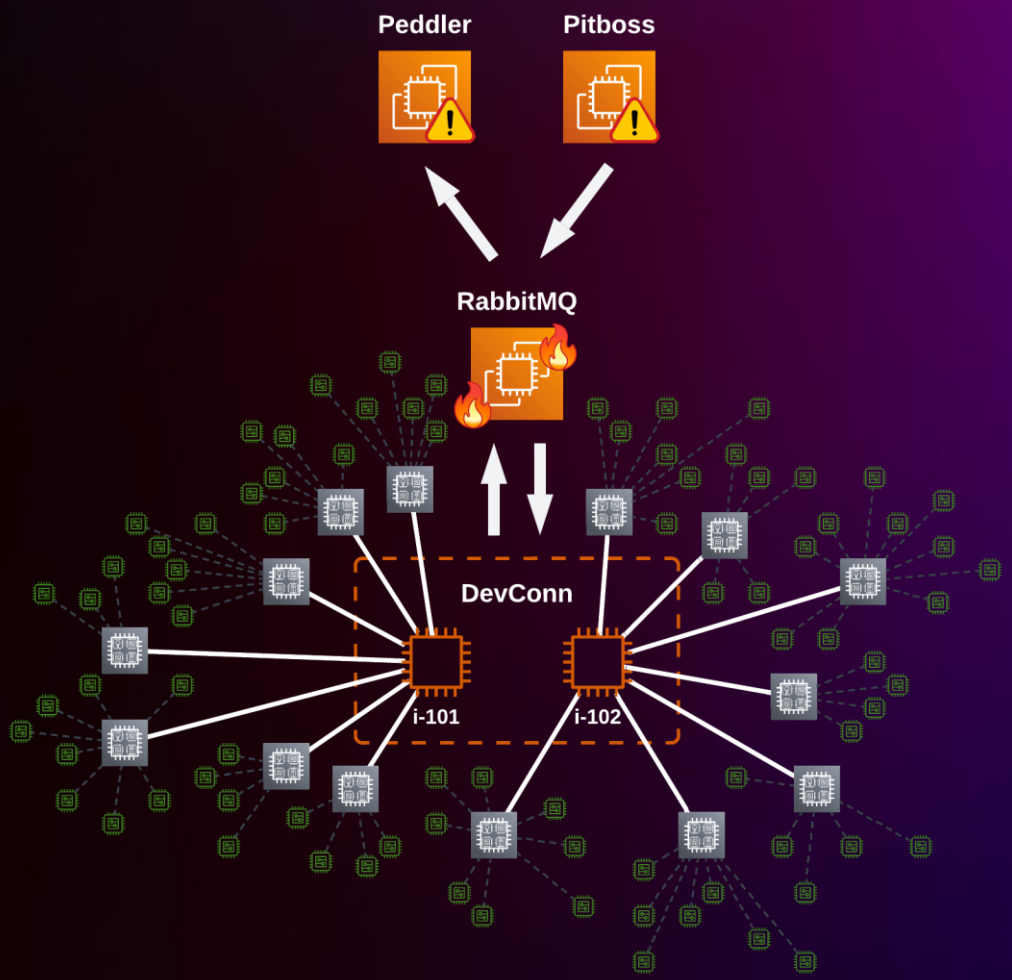
Future of home IoT

- Matter
  - Billions of devices by 2030
  - More devices per hub
- Hub Everywhere
  - Hubs in more devices (for example, TVs)
  - Massive increase in connected hubs



Future of home IoT

- Matter
  - Billions of devices by 2030
  - More devices per hub
- Hub Everywhere
  - Hubs in more devices (for example, TVs)
  - Massive increase in connected hubs
- Actual future is unknown
  - 500 million users in the next three years
  - What's the impact? 5x increase? 100x increase?



Hub Connectivity Platform 1.0

CORE PRINCIPLES CHECKLIST

	Natural growth	Matter + Hub Everywhere	
Low latency	Pass	Depends	
Reliable	Depends	Fail	
Scalable	Barely	Fail	
Maintainable	Fail	Fail	

Requirements

- Ultra-fast performance
  - <10 ms for each hop

- Reliable
  - Fail fast, tolerate multiple failure scenarios

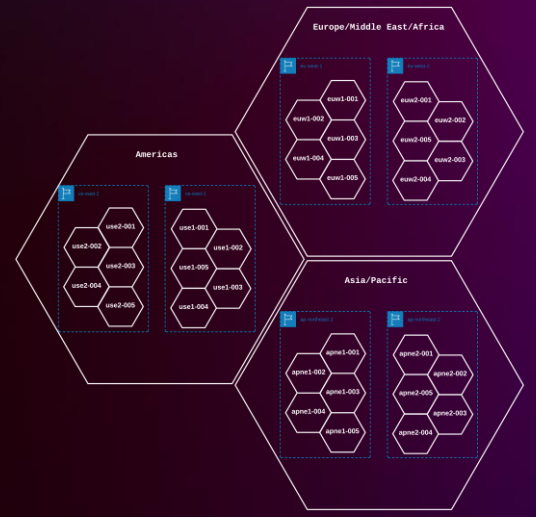
- Scalable
  - Support 100 million hubs and beyond

- Easily maintainable
  - Less time on infrastructure

Hub Connectivity Platform 2.0

Hub Connectivity Platform 2.0

- Cell topology
  - Smaller blast radius (fixed number of hubs per cell)
  - Greater fault tolerance (AZ and Region fail-over)
  - Need more capacity? Add more cells



Hub Connectivity Platform 2.0

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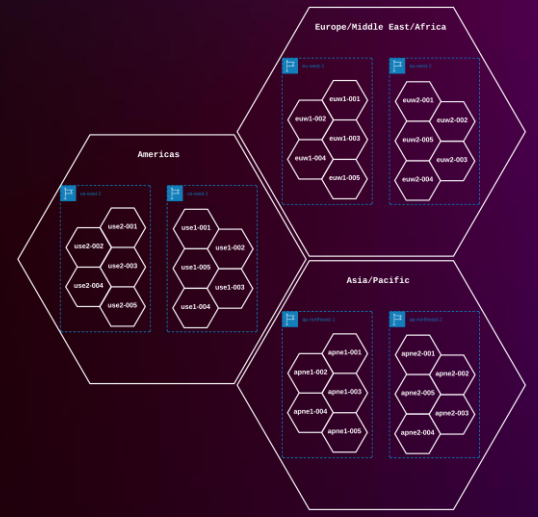
- Amazon MemoryDB for Redis



Why Amazon MemoryDB for Redis?

- Multiple uses
  - Streams, hashes, sorted sets, etc.
- Fast
  - Testing over 155,000 messages/second (using MemoryDB)
    - Mean round-trip time: <7 ms
    - p99 round-trip time: <25 ms
- Massively scalable
- Elastic clients

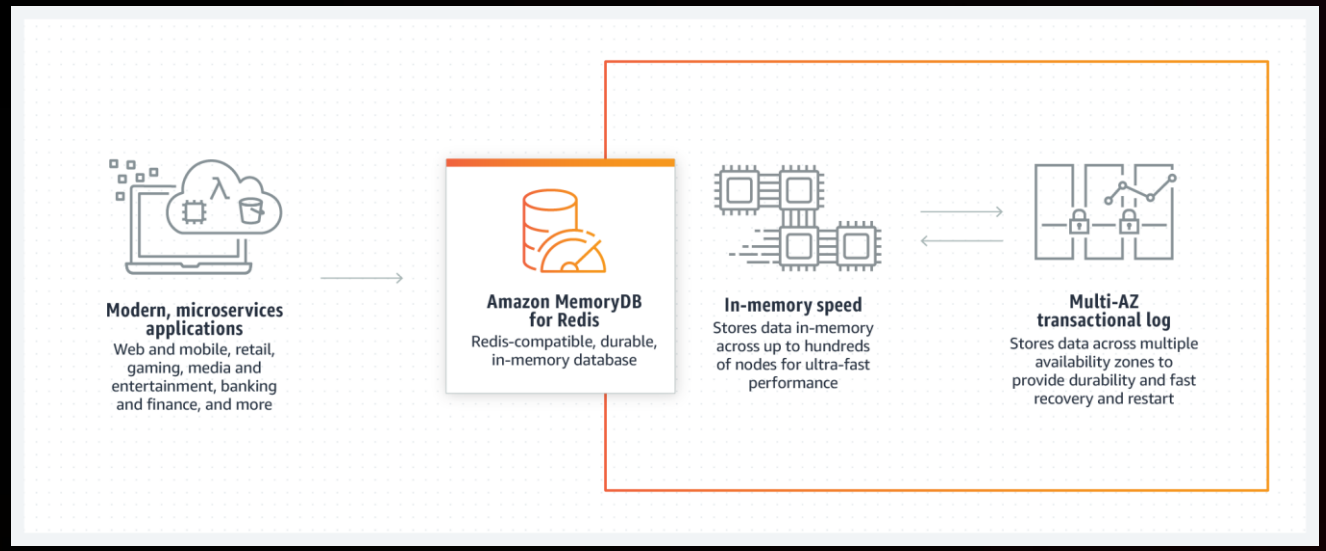
Why Amazon MemoryDB for Redis?

- Durable
- Managed service
- Easy self-service
- Existing Amazon partnership

What is MemoryDB for Redis?

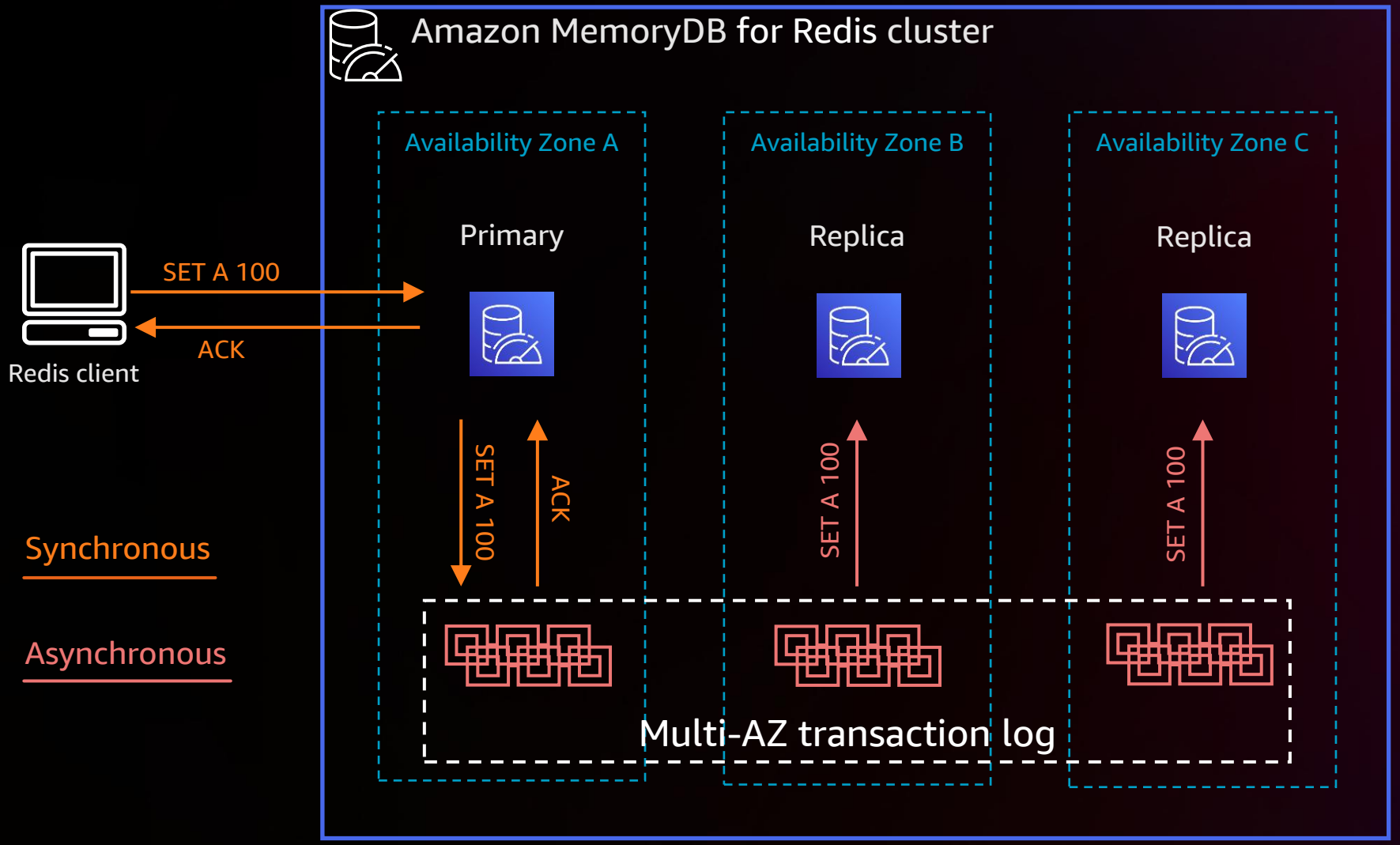
- Redis-compatible, highly durable, in-memory database service
- Access data with microsecond reads, process more than 160 million requests per second
- Multi-AZ data durability using distributed transactional log

In-memory performance, Multi-AZ durability



- Performance and durability
  - Microsecond reads, single-digit millisecond writes
  - Multi-AZ data durability
- Designed for scale
  - Scale horizontally and vertically
  - Online scaling
  - High availability with read replicas
- Features
  - Expand storage with data tiering
  - HIPAA, PCI-DSS, and others
  - Automatic failovers

Multi-AZ durability

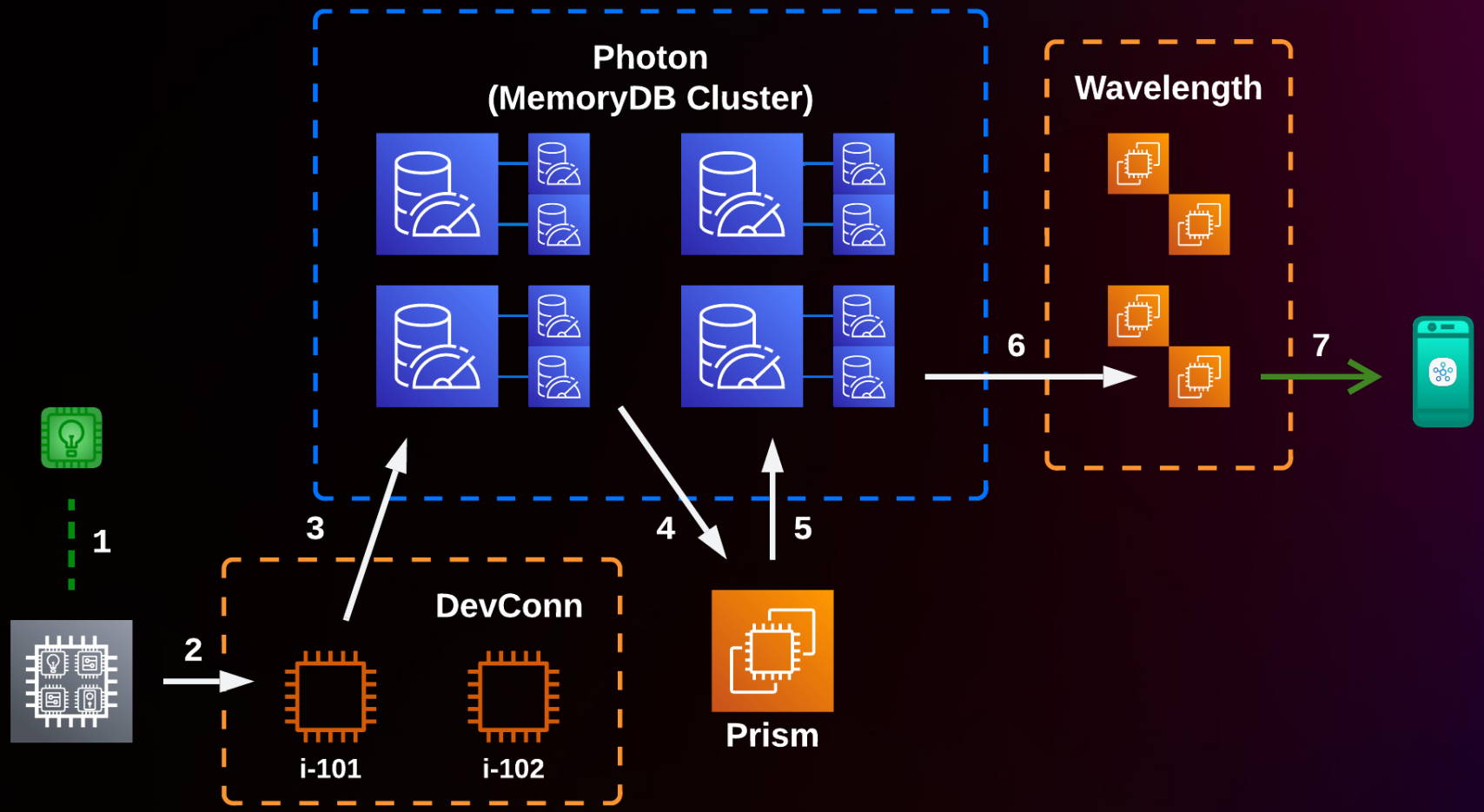


Automatic multi-AZ durability

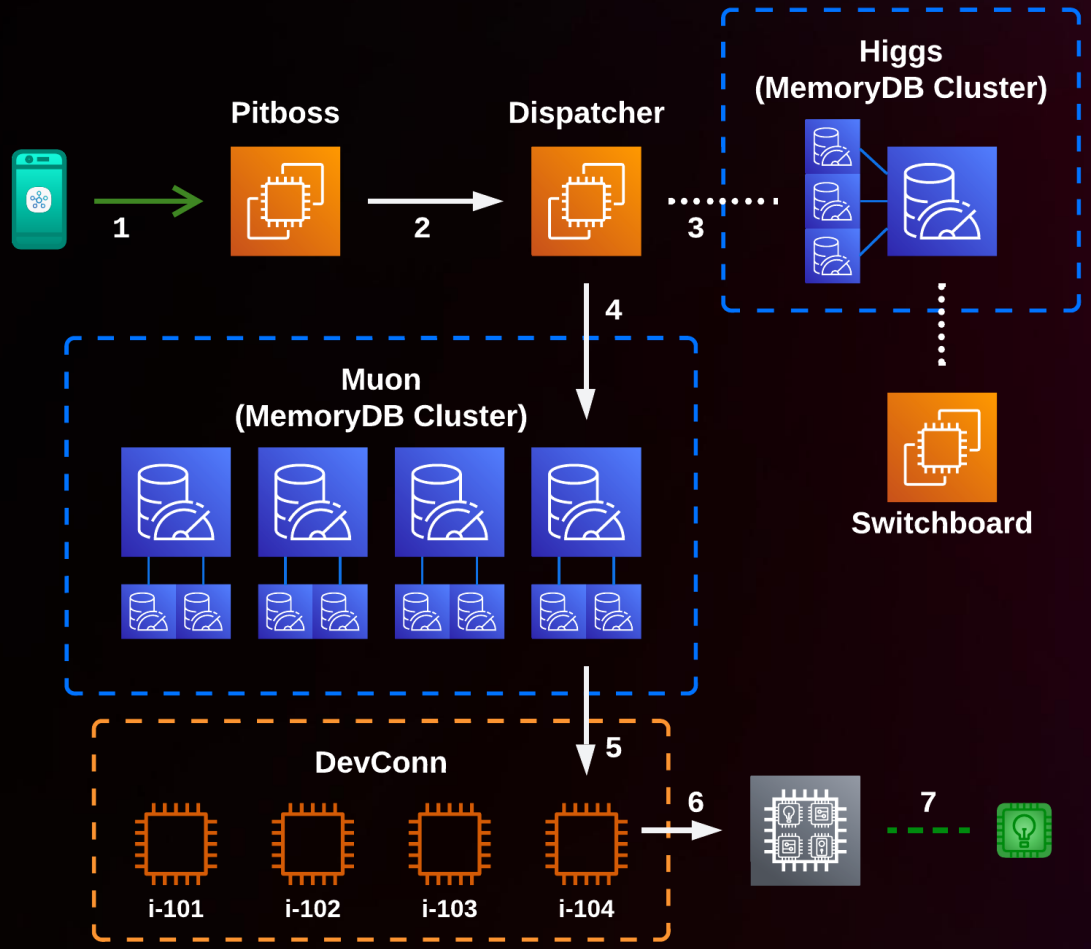
No data loss, even in case of node or AZ failure

Architecture

HCP 2.0 – Ingress



HCP 2.0 – Egress



HCP 2.0 with Amazon MemoryDB

CORE PRINCIPLES CHECKLIST

	Current architecture		HCP 2.0
	Natural growth	Matter + Hub Everywhere	All future growth
Low latency	Pass	Depends	**Pass**
Reliable	Depends	Fail	**Pass**
Scalable	Barely	Fail	**Pass**
Maintainable	Fail	Fail	**Pass**


My home
Favorites
30°
My home
Updated: 16:20
Living room
Hub
Connected
Living room
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What’s next

- Explore compression and/or other serialization
  - Currently uncompressed JSON strings
  - Using a more tightly packed payload can save money
- Better stream consumer health awareness
  - Current consumer “idle time” does not include all interactions
  - Needed for better stream/consumer cleanup
  - Redis changes are coming!

Additional resources

Get started with a 2-month free trial of MemoryDB

MemoryDB service documentation

Contact the MemoryDB team for more questions or help

Learn more about Samsung SmartThings and Matter

Thank you!

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