

STORAGE DEVELOPER CONFERENCE



Fremont, CA
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BY Developers FOR Developers

A **SNIA** Event

Demystifying Edge Devices Cloud Native Storage for Different Data Sources

Umang Kumar

Subhadip Das

Edge is the new Core

- [Gartner](#) predicts that by 2025, three-quarters of enterprise-generated data will be created and processed at the edge – outside a traditional centralized data center or cloud. (That's up from just 10 percent in 2018)
- Increase in the size of working dataset which would need real time insights at the edge.
- Need to groom the data at the Edge itself and be ready to be able to take actionable measures based on user feedback at real time.

5G Delivers Speed, Scale and Stability for Edge

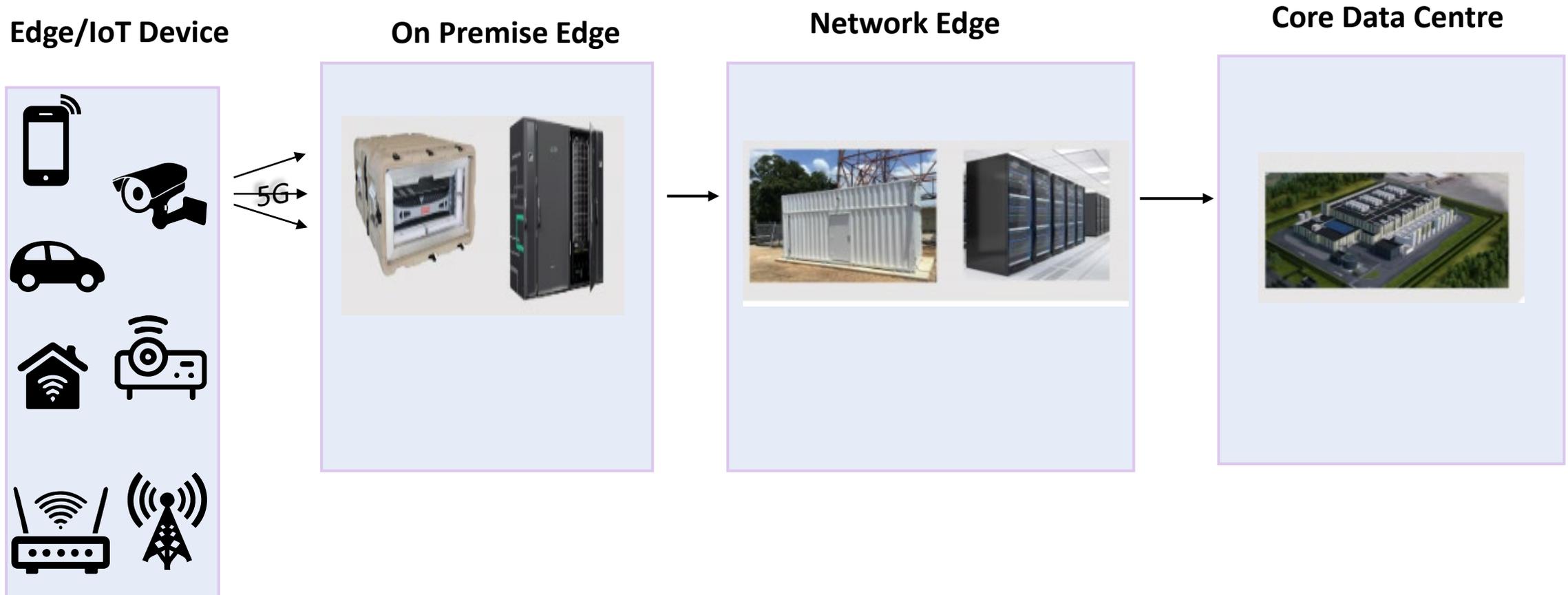
	4G LTE	5G
Average Data Rate	25 Mb/s	100 Mb/s
Peak Data Rate	150 Mb/s	10,000 Mb/s
Latency	50 ms	1 ms
Connection Density	2,000 km ²	100,000 km ²

- With theoretical peak data rates up to 100 times faster than current 4G networks, 5G holds the promise of enabling incredible new applications and use cases such as autonomous vehicles, Telemedicine and the ability to share potentially life-saving high-resolution real-time medical imaging – just to name a few
- The global volume of zettabytes data generated annually is projected to triple between 2020 and 2025 according to IDC report and 5G will be the biggest contributor

Data Explosion at Edge – 5G is going to be a game changer

- Today, more than 5 billion consumers interact with **data** every day — by **2025**, that number will be 6 billion, or 75% of the world's population. In **2025**, each connected person will have at least one **data** interaction every 18 seconds.
 - IDC predicts the average person will have nearly 5,000 digital interactions per day by 2025, up from the 700 to 800 or so that people average today.
- The edge will continue to grow at an exponential rate, driven by
 - Video Streaming (300MB to 7GB /hour) [Source – cctvcalculator.net] → This is only going to grow with 8K resolution and beyond
 - Smart Sensors (Example: Safety sensor in mining ops generate upto 3.6TB /hour)
 - Connected Cars (generating anywhere between 5-20 TB /day) [Source – IOT Now Transport]
- What do we do with all this data at the edge:-
 - 5G technology will shift how data is processed and the need to provide “real-time” data insight instead of data that is stored and acted upon later.

Edge Infrastructure

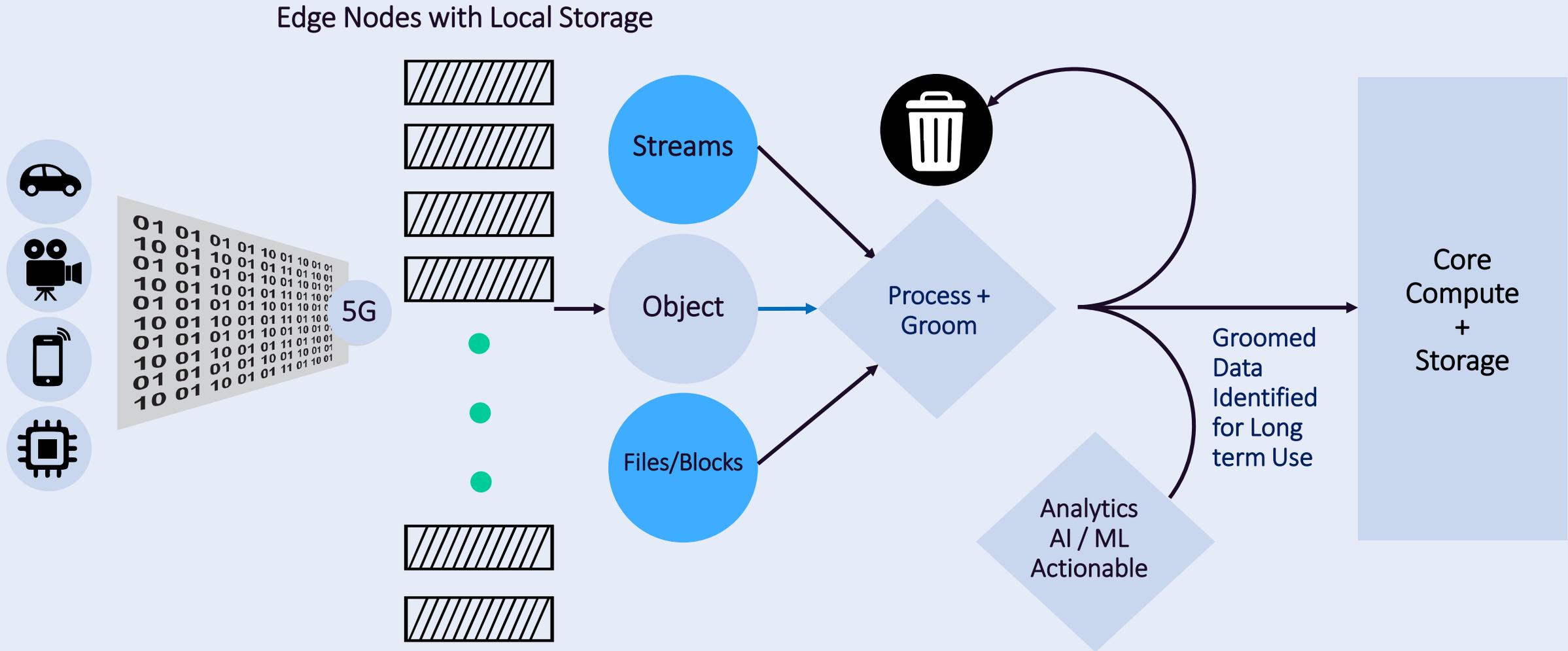


Emerging 5G Use Cases @ Edge

Application	Latency	Storage Capacity	Computing Power
Autonomous Driving / Connected Cars	Low	High	High
Video Surveillance	Low	High	High
Sensor from Smart Factories / Smart Grid	Low	High	High
Telemedicine	Low	High	High
Online Gaming	Low	High	High
Factory Automation	Low	High	High

The role of 5G is to facilitate offloading data to a local edge site for storage and processing

How will it all work – Edge Data Centre

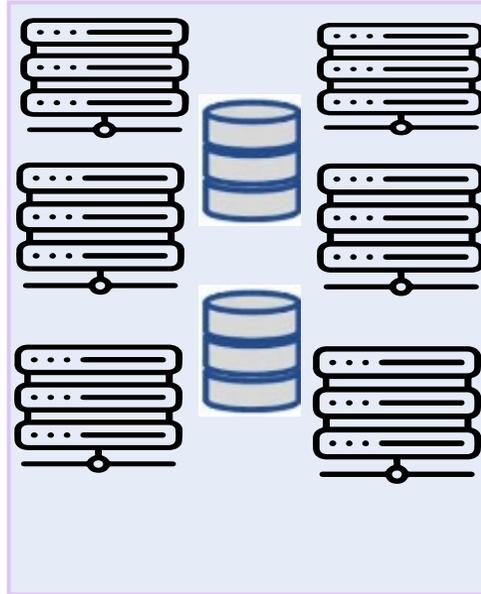


Cloud Native Architecture @ Edge

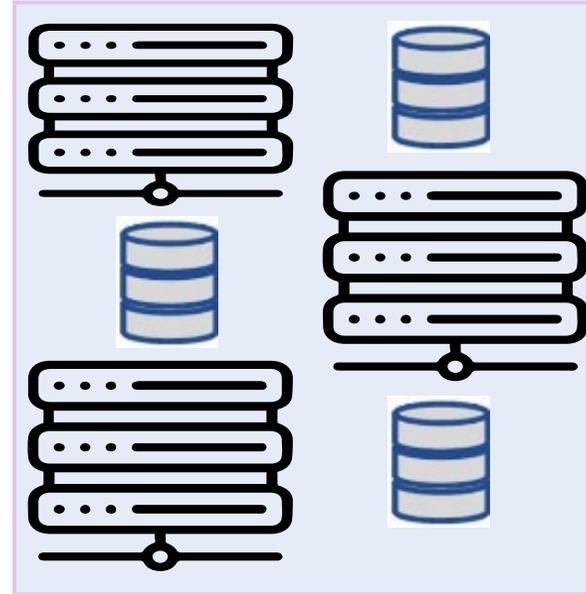
Edge/IoT Device



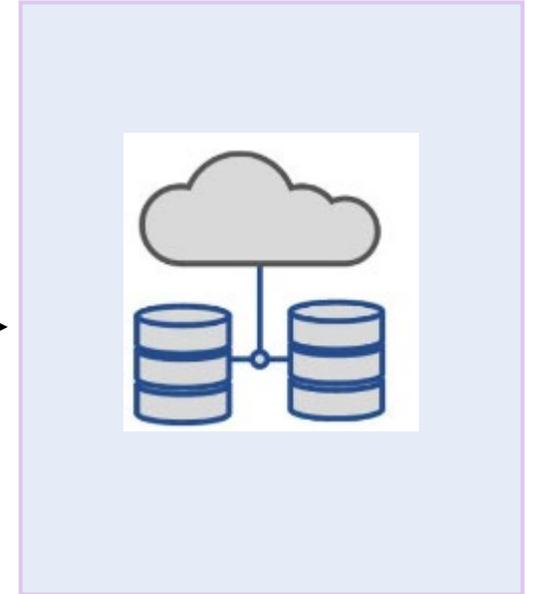
On Premise Edge



Network Edge



Core Data Centre



Centralized Kubernetes Management

Edge Architecture

- Need to have data platform that stretches from edge to core data centre
- Public cloud-based data platform where cloud vendors provide Azure stack, AWS outpost, solution that can be placed on prem at edge location and then extends it to public cloud as core data center
- Private cloud-based data platform where private cloud vendors provides their hardware and solution on edge location and then extends it to customer core private data center
- Hybrid cloud-based data platform where private cloud vendors provides their hardware and solution at edge locations and then extends it to Public cloud as core data centre

Storage Requirement @ Edge Infrastructure

Edge/IoT Device



5G

On Premise Edge



Low TBs

Network Edge



High TBs

Core Data Centre



PBs



0-32 GB

What does it mean for edge Storage

- Need to bring in enterprise class processing and action at the Edge :
 - Faster Storage interfaces to match up to the demands of low latency
 - Lower TCO, Denser, Highly available and Customized offering for different and unique data.
 - Need for operational simplicity and agility like public cloud on on-prem Edge nodes.
 - Better managing data through its lineage (Edge to Core to Archival to Discard)
 - Work with most Recent data → Keep the important data → Discard the rest
 - Stream processing tools
 - AWS Lambda, Azure/Google Functions, Knative, Flink (Apache)

Storage options at Edge

Cloud Native Kubernetes Storage (CSI)		
Commercial Offerings	Product	Vendor
	Container Storage	RedHat
	Kubera	MayaData
	Portworx	Pure
	Robin	Robin systems
	Trident	Netapp
	Greenlake	HPE
Open Source Projects	Projects	CNCF Status
	Ceph	Not Submitted
	LongHorn	Sandbox
	OpenEBS	Sandbox
	Pravega	Submitted



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