



2022 OFA Virtual Workshop

High Performance Object Storage

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SAMSUNG

HPOS S3 SELECT w/ Computational SSD Acceleration

Use Cases

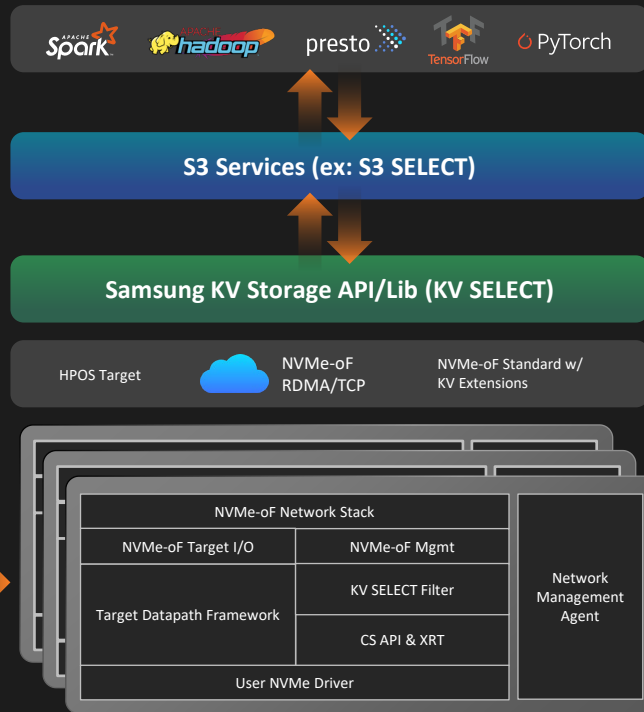
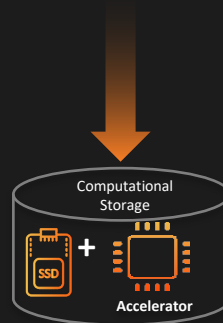
Large scale real time analytics - Smart City, Smart Home, eHealth, IoT, Images, Video, Security

Benefits

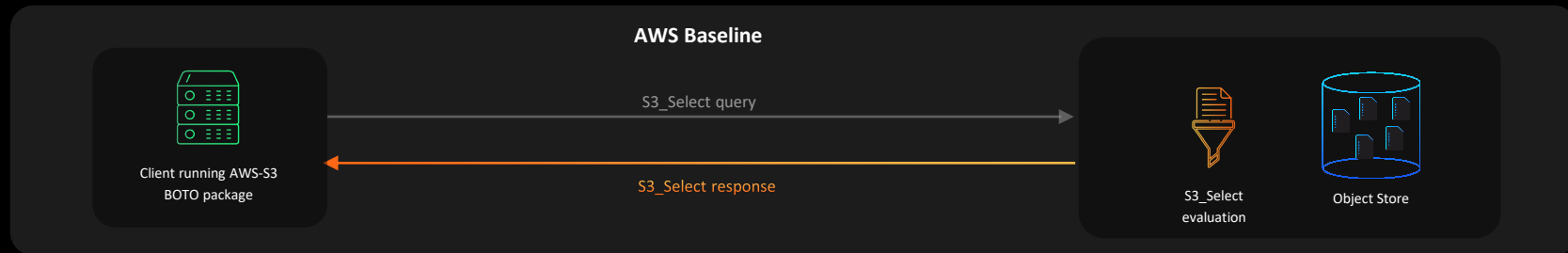
- **Faster** queries
- **Lesser** network traffic
- **Lower TCO** due to reduced CPU and network traffic



Tagged and
Partitioned Data



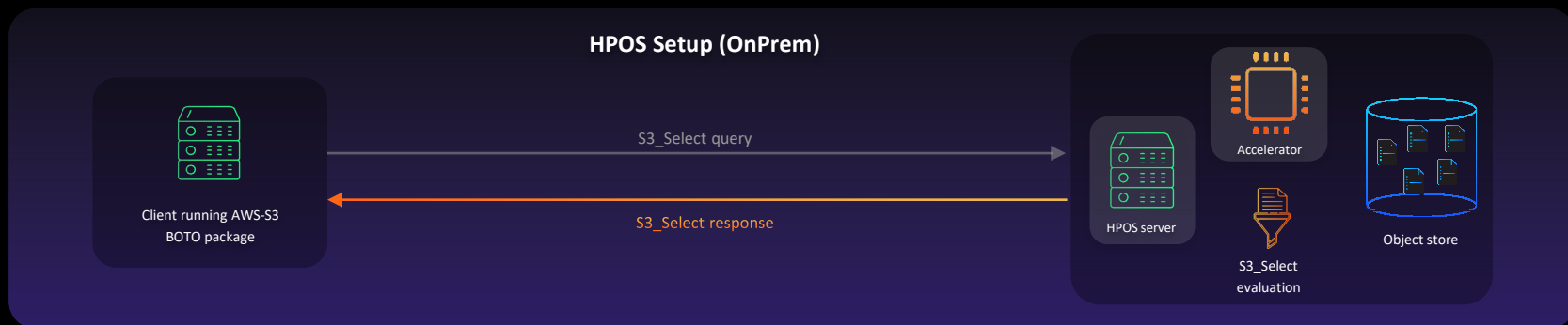
Near data processing for S3_Select



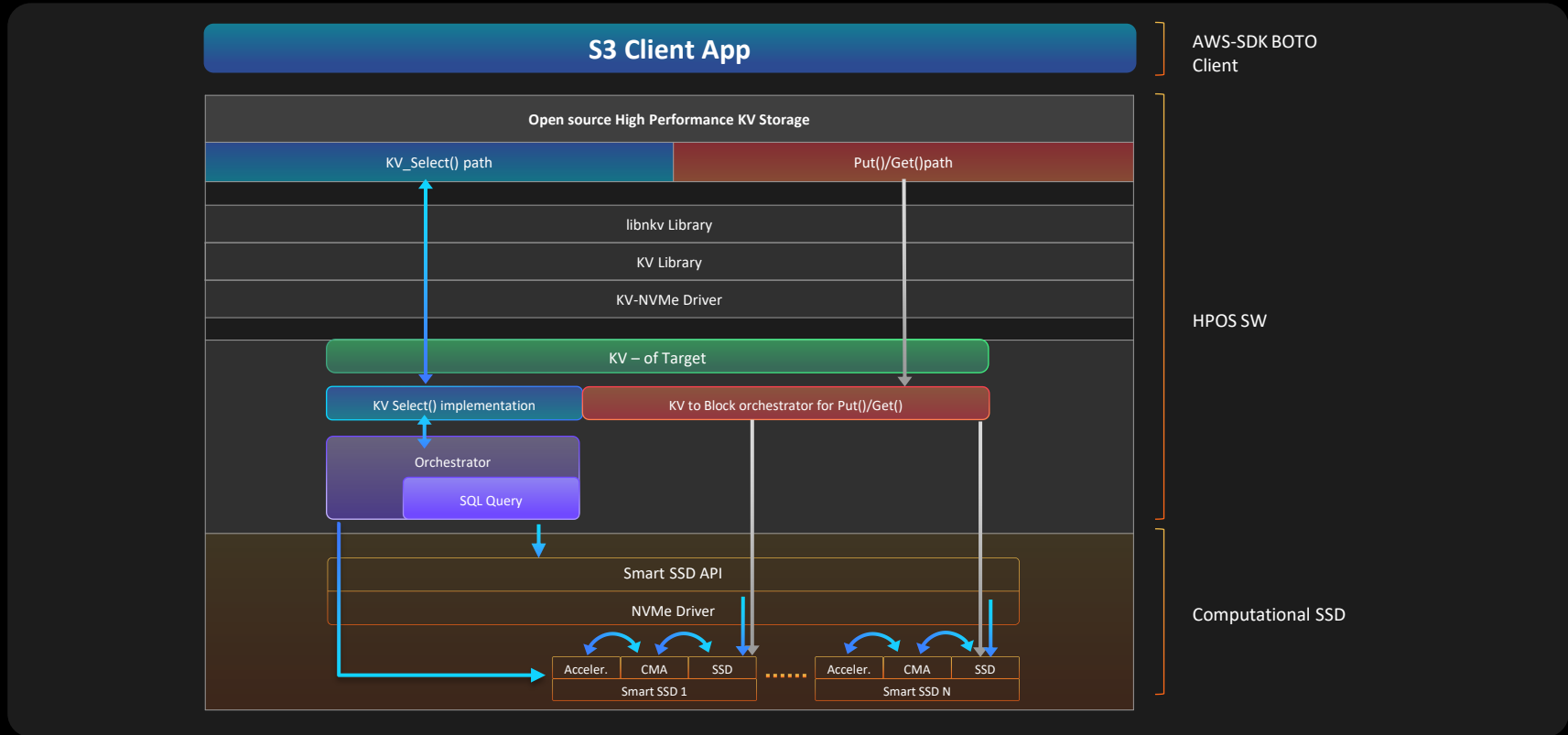
Customer's Sample Dataset

Index	Year	DayOfYear	Precipitation	ET0	tMax	tMin	RS
0	1	1	0	0	-26.8808	-29.7298	0
1	1	2	0	0	-27.0202	-30.9575	0
2	1	3	0	0	-28.0491	-31.0459	0
3	1	4	0	0	-26.2893	-29.3781	0
4	1	5	0	0	-25.1941	-27.9265	0
5	1	6	0	0	-23.5173	-27.2421	0
6	1	7	0	0	-23.8696	-29.4691	0
7	1	8	0	0	-24.4267	-29.0663	0

S3_Select Query ('Select COUNT(*) FROM S3Object s WHERE dayofyear < 55');



End-to-End S3 Select with HPOS



→ Normal data path → Path for SmartSSD offload CMA Computational Memory Area



AWS S3 Select vs HPOS S3 Select

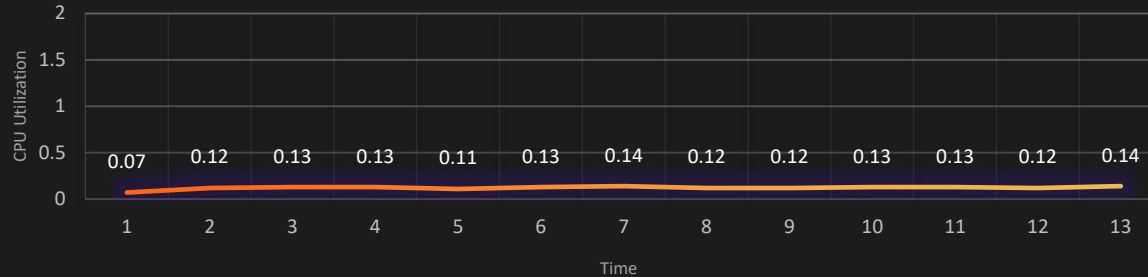
Throughput in MB/sec



Latency in Seconds



HPOS CPU Utilization Percentage



Power Savings Analysis

Observations

- On average there is ~6 Watts/hr of power saving using **single Smart SSD**
- Amounts to ~2 % of total power usage

Average watts/hr during test run



The background is a dark, navy blue gradient. It features several overlapping, semi-transparent geometric shapes, primarily triangles and quadrilaterals, in shades of dark grey and black. Scattered throughout the scene are numerous out-of-focus light points, or bokeh, in various colors including light blue, yellow, green, and red. Some of these lights are arranged in faint, linear patterns that suggest movement or data paths.

Thanks