Setting New Performance and Energy-Efficiency Standards for Streaming with Intel and Broadpeak

Intel Network Builders Webinar

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broadpeak
This is streaming at its peak

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01.

Introduction

01. Streaming has exploded (now overtaking broadcast viewing)

Generalization of multi-screen usage

Explosion of OTT streaming service offerings

Increase of non-linear consumption (VOD, catch up TV, start over)

02. Video service providers needs

Efficient content delivery networks (CDN) capable of delivering…

bigger streaming capacity

at controllable costs

03. Carbon footprint is a growing concern

Approach of Broadpeak

- **Analyze and take initiatives at industry level (co-founder with Intel of Greening of Streaming)**
- **Promote and deploy multicast streaming technology (multicast ABR)**
- **Encourage HW mutualization (multi-purpose, multi-tenancy use)**
- **Design denser configurations**

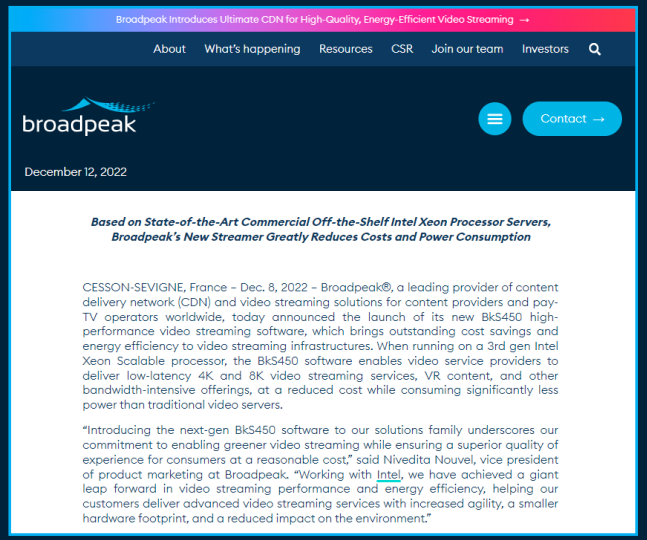
Greening of Streaming

The benefits to design denser configurations

Requires less HW to produce

Consumes less energy *(baseline consumption effect)*

04. The solution: Broadpeak BkS450 streaming software



Broadpeak Introduces Ultimate CDN for High-Quality, Energy-Efficient Video Streaming →

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December 12, 2022

Based on State-of-the-Art Commercial Off-the-Shelf Intel Xeon Processor Servers, Broadpeak's New Streamer Greatly Reduces Costs and Power Consumption

CESSON-SEVIGNE, France – Dec. 8, 2022 – Broadpeak®, a leading provider of content delivery network (CDN) and video streaming solutions for content providers and pay-TV operators worldwide, today announced the launch of its new BkS450 high-performance video streaming software, which brings outstanding cost savings and energy efficiency to video streaming infrastructures. When running on a 3rd gen Intel Xeon Scalable processor, the BkS450 software enables video service providers to deliver low-latency 4K and 8K video streaming services, VR content, and other bandwidth-intensive offerings, at a reduced cost while consuming significantly less power than traditional video servers.

"Introducing the next-gen BkS450 software to our solutions family underscores our commitment to enabling greener video streaming while ensuring a superior quality of experience for consumers at a reasonable cost," said Nivedita Nouvel, vice president of product marketing at Broadpeak. "Working with Intel, we have achieved a giant leap forward in video streaming performance and energy efficiency, helping our customers deliver advanced video streaming services with increased agility, a smaller hardware footprint, and a reduced impact on the environment."

BkS450

Broadpeak next-gen HTTPS caching and streaming software

- **Modern HTTP(S) engine dedicated to streaming and caching applications**
- **Delivers HD, 4K, XR and volumetric content at scale**
- **Fully exploits latest generation hardware**
- **Set new standards for performance and energy-efficiency**

02.

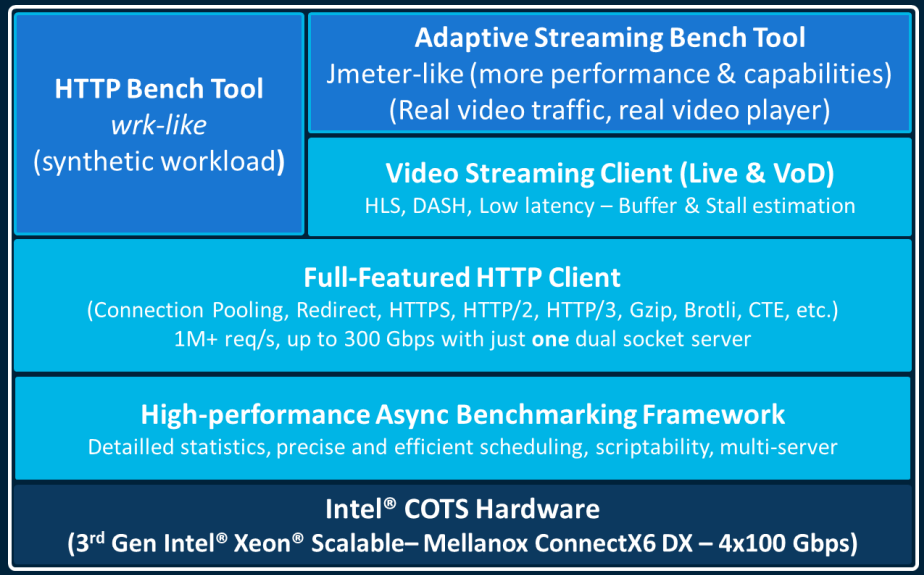
New records in streaming performance

01. Broadpeak full-featured benchmarking tool

- **Resulting from a collaboration with Intel (*)**
- **Generate various kinds of realistic, high-concurrency traffic patterns with very high efficiency**
- **Makes it easy to repeat benchmarks in development phase to deliver highly optimized and efficient software**

« If you want to be a reference in streaming performance, you first need to be a reference in measuring performance »

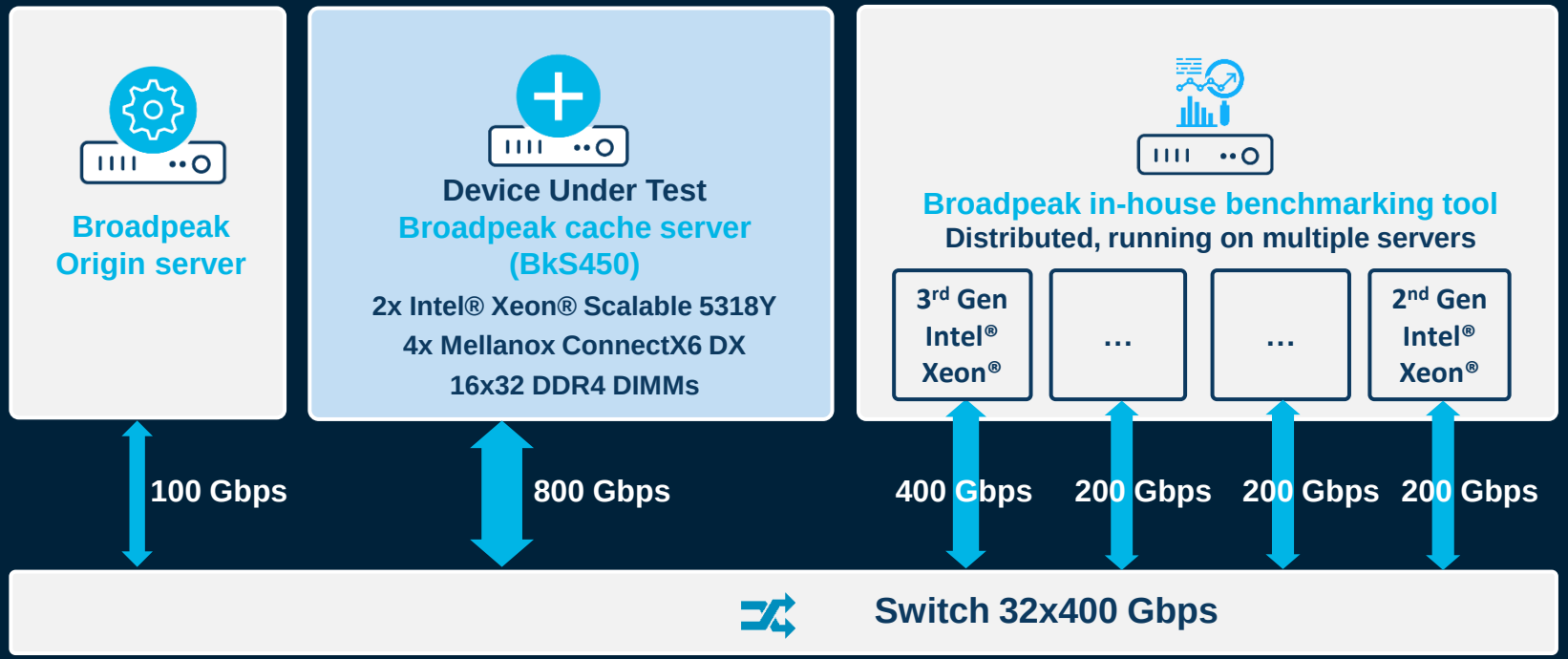
Nivedita Nouvel, VP Products & Marketing, Broadpeak



Broadpeak benchmarking tool

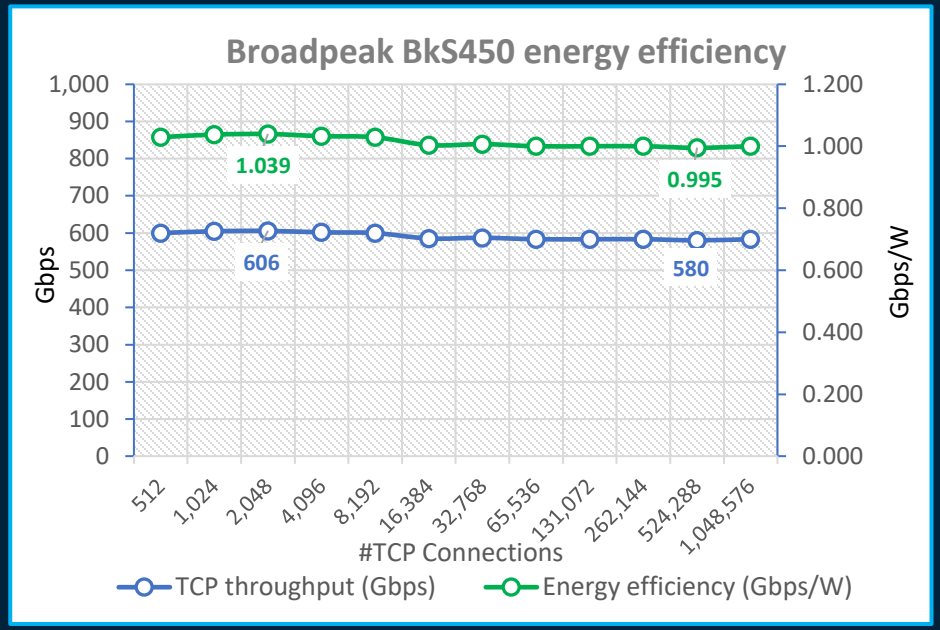
(*) https://networkbuilders.intel.com/solutionslibrary/broadpeak-builds-no-compromise-cdn-benchmarking-tool

02. Benchmarking setup



03. Breaking records in throughput and energy-efficiency

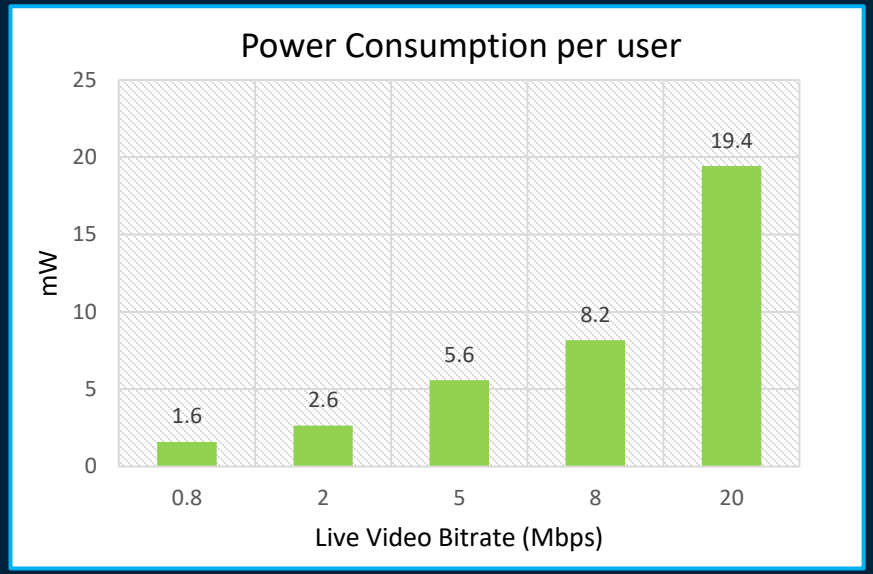
- Synthetic live-linear workload that randomly picks fixed-size 1MB objects with a 100% cache hit ratio
- Unprecedented range of concurrent TCP connections, up to 1 million
- 600+ Gbps raw network throughput, 1.04 Gbps/W power-efficiency
- Low variability across all TCP connection levels



(*) on comparable hardware

04. Streaming energy-efficiency per user with real video players

- New metric to better reflect business needs: consumed power per supported user
- Real HLS/DASH video players in high-concurrency conditions
- 1.6mW per user for 0.8 Mbps mobile streaming, only 19mW for residential 20 Mbps UHD streaming



Video bit rate	0.8 Mbps	2 Mbps	5 Mbps	8 Mbps	20 Mbps
TCP throughput	280 Gbps	435 Gbps	531 Gbps	575 Gbps	595 Gbps
Number of concurrent users	350 000	220 000	104 333	71 333	30 000
Power consumption	560 W	583 W	583 W	583 W	583 W
Power utilization per user	1.6 mW	2.6 mW	5.6 mW	8.2 mW	19.4 mW
Energy efficiency	0.5 Gbps/W	0.75 Gbps/W	0.91 Gbps/W	0.99 Gbps/W	1.02 Gbps/W

03.

Drivers for success

02. Unique, high performance and sustainable design

Efficient use of hardware potential – including CPU capabilities and latest OS features – combined with fully redesigned and modern HTTP(S) stack

- **Intel® Xeon® Scalable Processors with Intel® Data Direct I/O Technology (Intel® DDIO)**
- **Intel® Xeon® Scalable Processors with Intel Crypto Acceleration**
- **Profiling capabilities**

01. Working with Intel

« Our collaboration with Intel and their highly-skilled performance experts has allowed us to discuss our design, get extremely valuable feedback on what is the best approach to exploiting their CPUs, and guidance how to design modern software, with an architecture adapted to high-core count CPUs »

Guillaume Bichot, Head of Exploration, Broadpeak

04.

Benefits for the industry

01. Higher density and energy-efficiency, now

- Ready for new services (4K, XR, Volumetric)
- Higher energy-efficiency, including high-concurrency traffic patterns
- Density and better use of resources
- Benefits modest configurations (far edge)
- Safety margin on performance
- Immediate energy-efficiency gain for most service providers

05.

Conclusions

01. Key achievements

Best ever throughput and energy-efficiency with dual 24 core Intel® Xeon® based servers for a video streaming use case

- **600+ Gbps raw network throughput**
- **1.04 Gbps/W power-efficiency**

Stunningly low energy consumption for wide range of use cases, large numbers of concurrent users (up to 350 000), without observable playback issues

- **1.6mW per user for typical 0.8 Mbps mobile streaming**
- **Only 19mW per user for fixed residential 20 Mbps UHD streaming**

01. Just the beginning of the journey

Promising efficiency and performance-per-Watt envelope improvements expected with 4th and 5th Gen Intel® Xeon® Scalable Processors for the rapidly growing media streaming market

Thank you !

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