VICKI MILHOAN

VISUAL RETAIL / RETAIL SOLUTIONS DIVISION / INTEL

PLATFORM SOLUTIONS ENGINEER – DIGITAL SIGNAGE

Internet of Things Group

Visual Retail Additional Public Information

For end customers - Digital Signage Technology at Intel

- http://www.intel.com/content/www/us/en/retail/retail-digital-signage.html
- Includes getting started guides, case studies, solution and blueprints

For developers – Intel Technology for Retail

- http://www.intel.com/content/www/us/en/retail/solutions/developers.html
- Includes reference designs, specifications, evaluation kits, where to buy

Intel Ecosystem Enabling Technologies

SOFTWARE REFERENCE CODE

Intel® Media SDK

Intel® Distribution for OpenVINO™ toolkit

Intel(R) Media Accelerator Reference Software

FORM FACTOR / FEATURE SPECIFICATIONS

INTEL SILICON LONG-LIFE IOTG ROADMAP

IOTG SILICON GENERATIONAL IMPROVEMENTS

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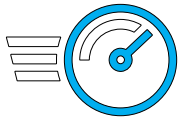
8TH GEN INTEL® CORE™ (COFFEE LAKE) PLATFORM HIGHLIGHTS



PERFORMANCE

Multiple offerings for scalable performance

Enhanced performance over previous generation with up to **6 Cores**

IMMERSIVE GRAPHICS AND MEDIA PERFORMANCE

Intel's 9th generation graphics engine

Fast video acceleration

3 independent 4K Ultra HD displays

Extensive media codec library

HDMI 2.0/HDCP 2.2 (w/LSPCON)

ENHANCED OS OFFERING

Windows© 10 Enterprise & IOT Enterprise (64b),

Linux*

VxWorks*

I/O

IMPROVED I/O CAPABILITY

Up to 30 High-Speed I/O lanes on PCH

Integrated **USB-C / USB 3.1** Gen2 (10Gb/S)

IOTG Roadmap SKUs are 15 year life availability!

*Other names and brands may be claimed as the property of others

INTEL® ATOM™ PROCESSOR E3900 SERIES HIGHLIGHTS

PERFORMANCE

Multiple offerings for scalable performance

Enhanced performance over previous generation

Exceptional performance per watt in a compact package

IMMERSIVE GRAPHICS AND MEDIA PERFORMANCE

Intel's 9th generation graphics engine/up to 18 EUs

Fast video acceleration

3 independent 4K Ultra HD displays

Up to 15 simultaneous 1080p30 decode streams

Extensive media codec library

IMAGE PROCESSING

4 vector image processing units

13MP still capture

4K video capture

HDR video up to 1080p30

Supports up to 4 MIPI cameras

IMPROVED I/O CAPABILITY

4 PCIe* ports with 6 lanes

6 USB 3.0 ports

eMMC 5.0, SD card 3.01, 4 HSUARTs, 3 SPI interfaces

ENHANCED OS OFFERING

Support for: Windows© 10 Enterprise, Windows 10 IoT core, Linux*, VxWorks* , Android

RELIABLE COMPUTING

Enhanced data integrity with ECC

T_J -40°C to 110°C temperature rating

Extended product life

*Other names and brands may be claimed as the property of others

**See PCIe overview spec (https://www.intel.com/content/www/us/en/io/pci-express/pci-express-architecture-devnet-resources.html)

*** All Customer Support on TCC Technology feature available starting Q3'18

Intel Confidential – NDA Platform Roadmap. All dates and plans are subject to change without notice.

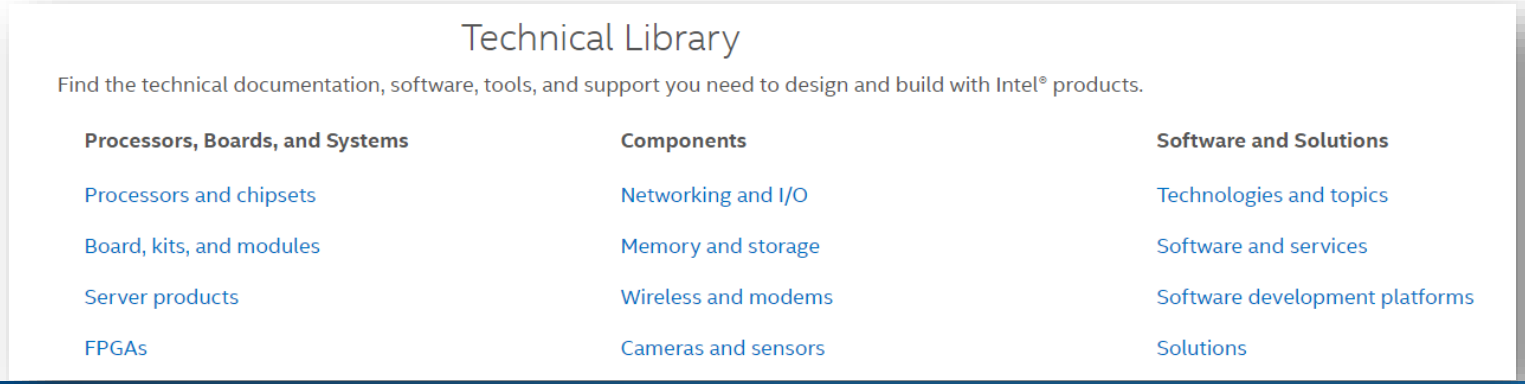
RESOURCE & DESIGN CENTER

https://www.intel.com/content/www/us/en/design/resource-design-center.html

Site overhaul– content now easier to find! RDC includes access to External Design Specification (EDS) and design-in presentations, among other documents.

Use in conjunction with https://ark.intel.com/ for SKU comparisons

Registration will verify or prompt creation of a Confidential NDA (CNDA)



INTEL VDD – VISUAL DATA DEVICE

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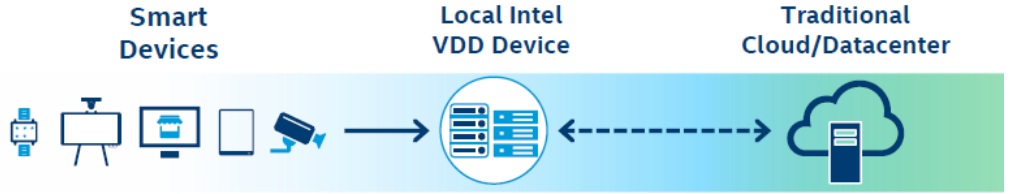
VISUAL DATA DEVICE SPECIFICATION

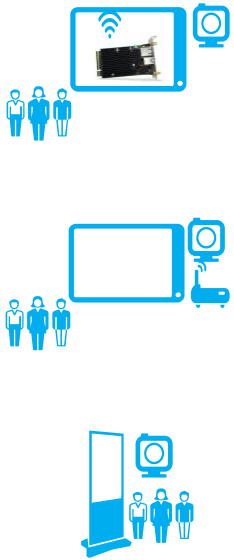
Hardware Specification for Audio/Video processing enabling server capabilities at the edge without requiring operational conditions of a data center

- Remote Manageability with Intel® vPro
- Security
- Long-life product availability
- High CPU and GPU processing capabilities
- Low latency to on-site devices
- Compliance with the OpenFOG specification
- Expansion (FPGA, Accelerators)
- Support for a variety of operating environments
    - Higher operating temperature
    - Noise limitations
    - Touch temperature limitations



VISUAL DATA DEVICE FOR DIGITAL SIGNAGE & KIOSKS

DIGITAL SIGNS & KIOSKS

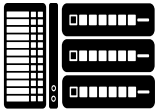


- Camera feeds
- Immediate Camera Inferencing can occur on Media Player
- Video playback log/Proof of Play

- Content Updates
- Near real-time content triggering
- Schedule Updates

ON-SITE-NETWORK INFRASTRUCTURE

INTEL VDD



- Single user of site-to-cloud network bandwidth
- Short-term video inferencing
- Cached video content
- Transcoding & transrating video for a variety of endpoints
- Short-term analysis for video playback scheduling

CELLULAR OR FACILITY BACKHAUL

- Video analytics metadata (filtered to meet privacy demands)
- Video playback log (Proof of Play)

DATA CENTER / CLOUD

- Generate Insights from a variety of source
- Longer-term analysis for video playback schedules
- Complete Video Content Library
- Hosts Data Dashboard

- Content Distribution
- Scheduling Updates

Low-latency, On/Near-Premise, Configurable Workloads

Environmental & Audio Sensing

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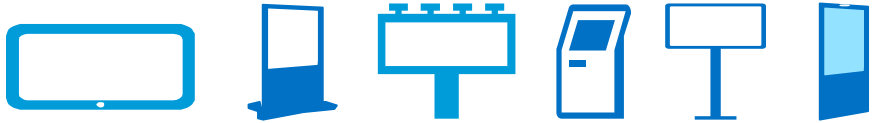
Sensor Data Aggregation for Visual Devices/ IoT Endpoints



SENSING

CONTROL

AUDIO

PAYMENTS

Pioneer Pass Sensor Hub

3rd Party Sensors

Temperature/Pressure /Humidity

Poisonous Gas

Air Quality

Audio Codec (MIC)

USB 2.0

Media Player

Analytics *

Sensor & Control App (Audio SW)

Content Player*

Beacon[1](WiFi-BLE)

MQTT/ TLS 1.2

AWS Cloud

REST API

UI

intel

INTEL PLUGGABLE FORM FACTORS

INTEL ® OPEN PLUGGABLE SPECIFICATION+ (INTEL ® OPS FAMILY)

INTEL® SMART DISPLAY MODULE (INTEL® SDM)

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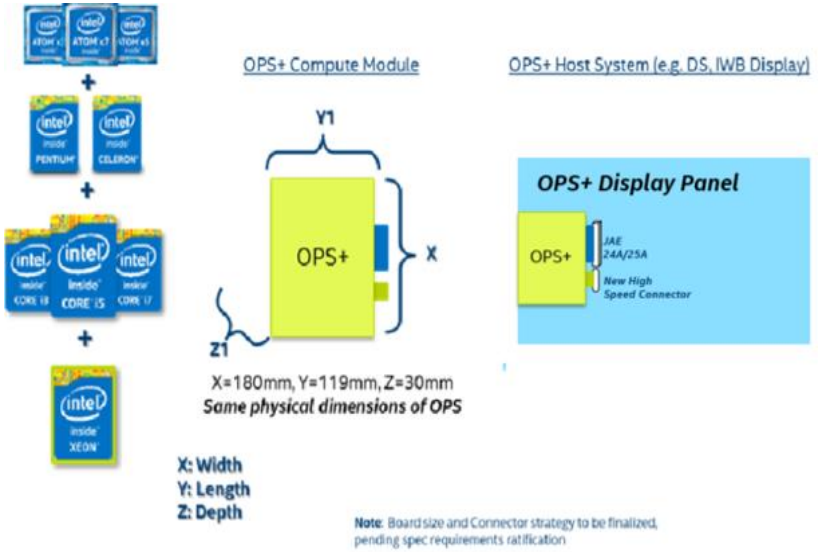
Next Gen Open Pluggable Specification – OPS+

- Intel freely licensed specification for next-generation pluggable media players, displays, and adjacent visual retail devices. OPS+ compute board includes:
  - CPU
  - Memory and Storage
  - Voltage Regulation
  - Networking device
- Backward compatibility through JAE TX 24A/25A connector architecture
- New high-speed connector to meet high-speed bandwidth for different connection interfaces like 8K display support, PCIe
- OPS+ supports basic and extended features, with continuum of Intel® Atom®, Core™, **Xeon®** processors and Intel® FPGAs
- Enhanced thermal characteristics to support up to CPU TDP 45W

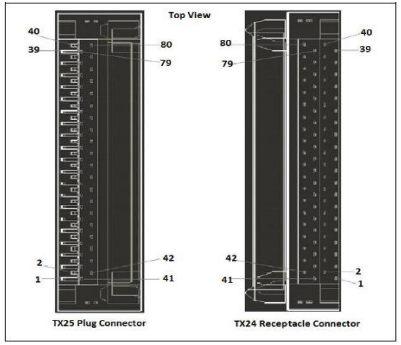


- Webpage: intel.com/ops

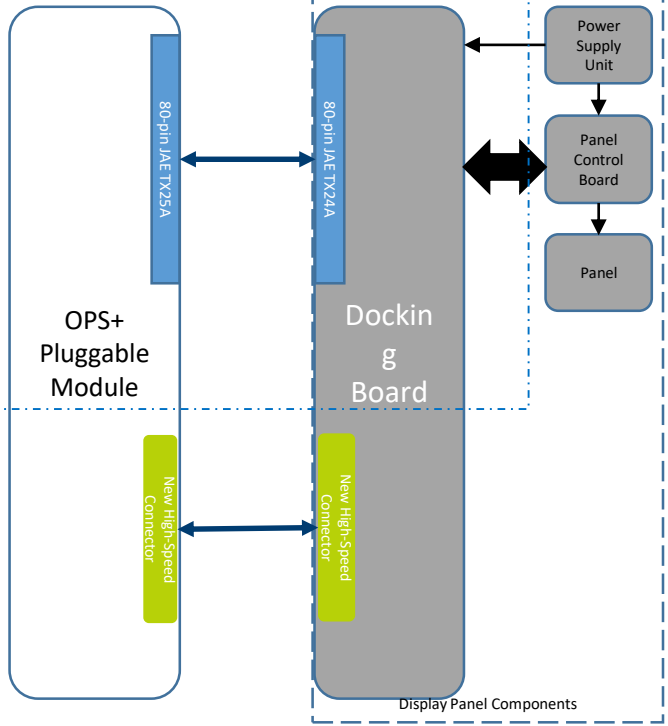
Futureproof Connector Architecture

Backward compatibility with OPS and its variants

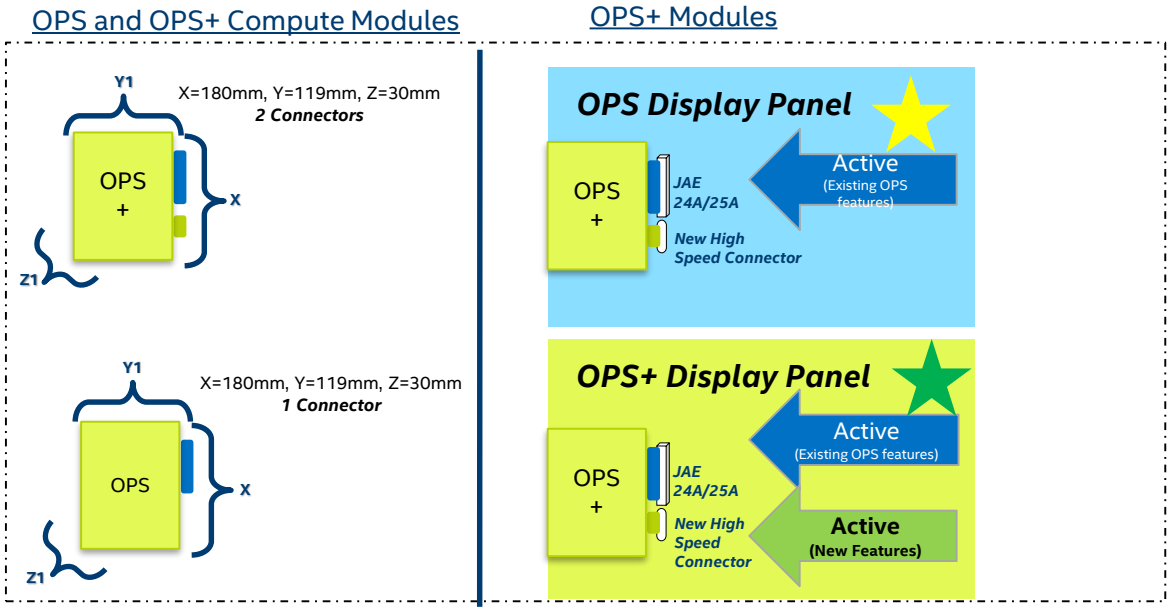
JAE TX
24A/25A



New High-Speed Connector (Blind Mate)



OPS+ Backward Compatibility



Intel® SDM – Smart Display Module

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Intel® Media Accelerator Reference Software

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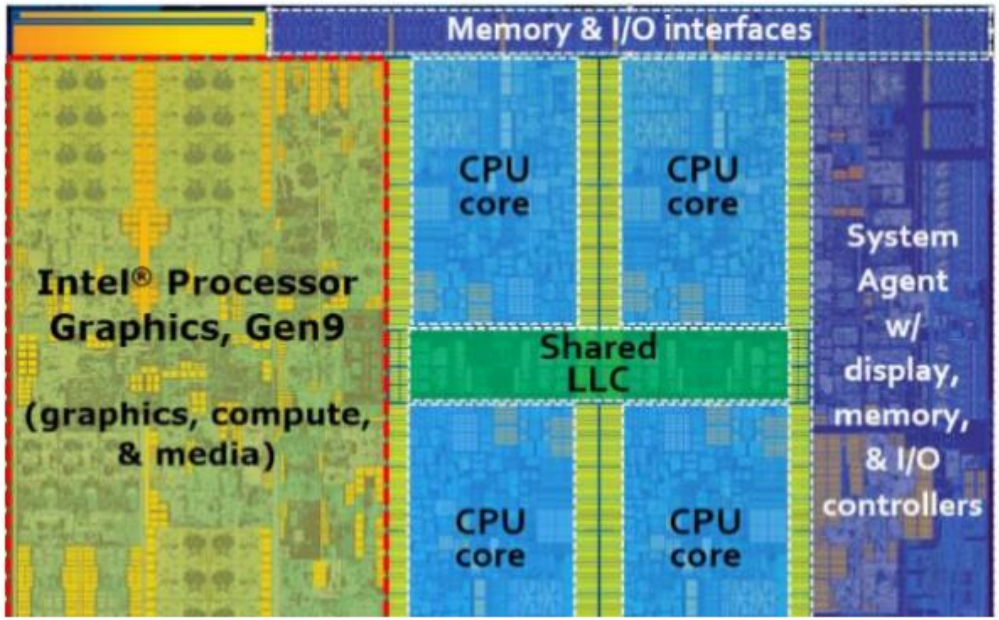
INTEGRATED GPU – AN AVAILABLE RESOURCE, OFTEN UNDERUTILIZED

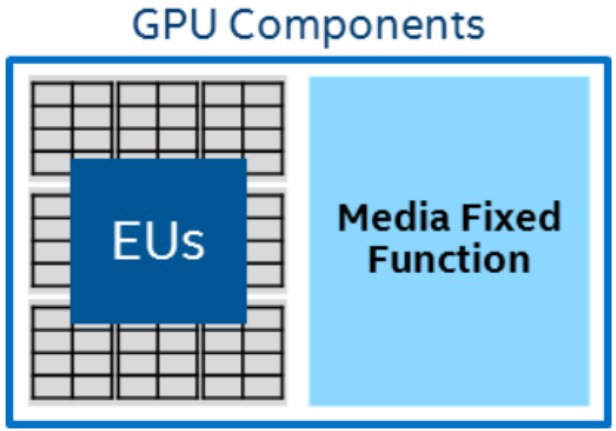


Components layout for an Intel(R) Core(TM) i7 processor 6700K

Media Acceleration using the Intel integrated GPU allows more CPU headroom to run applications

INTEL GPU COMPONENTS

- **Execution Units/EUs**: General purpose execution units. These are used for graphics rendering, but they are also suited to a wide range of media processing tasks.
- **Media Fixed Function**: In addition, specialized fixed function hardware accelerates video codec and frame processing algorithms for fundamentally higher performance at lower power than the EUs or CPUs.

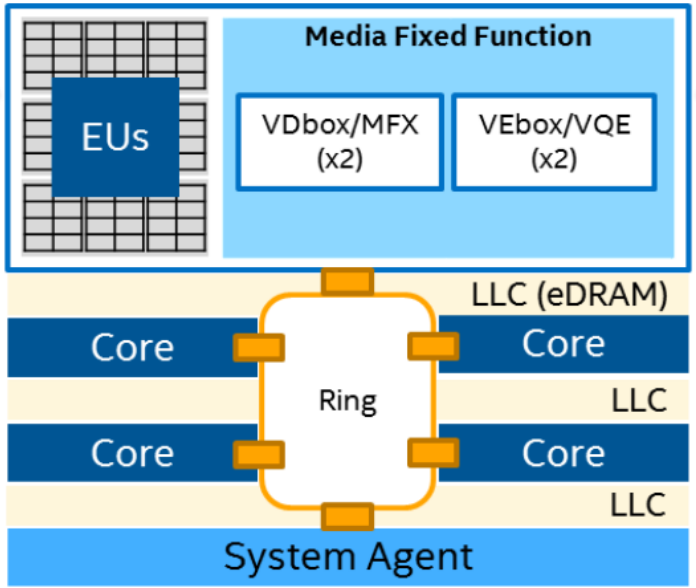


There are two main ways that developers can access the amazing performance capabilities of Gen graphics GPUs:

1. **Intel® SDK for OpenCL™ applications**: provides low level access to EUs and memory hierarchy, with an increasing set of extensions to provide access to media fixed function capabilities.
2. **Intel® Media SDK** provides higher level access to complete codec implementations through an optimized asynchronous framework.

Intel® SDK for OpenCL™ Applications:

- Access EUs
- (and Media Fixed Function)
- (and CPU Cores)



Intel® Media SDK:

- Access Media Fixed Function
- Complete video codec solutions utilizing FF, EUs, (and CPUs for SW implementations)

VDbox – CODEC operations
VEbox – frame operations like denoise and deinterlace

WHAT IS INTEL® MEDIA ACCELERATOR REFERENCE SOFTWARE?

Media Player Reference

- Using best practices for HW accelerated Decode, Encode and Video processing and Compositing
- Supported formats
  - Container formats - MPEG2, MP4, MK
  - Video formats – H264, HEVC, MPEG-2, VP9
- Video Wall 2x2, 2x3 (validated configurations)

Reference Code

- Optimized to utilize hardware acceleration using Intel® Media SDK and DirectX11
- Incorporates Microsoft Media Foundation SDK

Media Content Included

- Formats
  - Container formats - MPEG2, MP4, MKV
  - Video formats – H264, HEVC, MPEG-2, VP9
- HDR, non-HDR, and 4K content
- Landscape and portrait orientation

Collaterals

- User Guide/ Manual
- Implementing the reference code - White paper
- Executables with Source Code

WHAT IT IS NOT

- Production worthy media player
  - Reference software only
    - License allows source code access
    - Integrate with existing media playback solution
  - Can be used as demonstration solution if desired
- The only way to optimize graphics processing on Intel Architecture
  - Using best practices, Intel® Media Accelerator Reference Software may be able to help speed time to market

ACCESS TO THE REFERENCE SOFTWARE

The Software kit is available at:
https://registrationcenter.intel.com

Contact your Intel representative (Vicki) to get access to the Software kit

User must have an IRC account and a serial number to access the kit

Users will need to respond to the EULA and accept the license agreement to download the kit

Intel® Media Accelerator Reference Software requires NDA

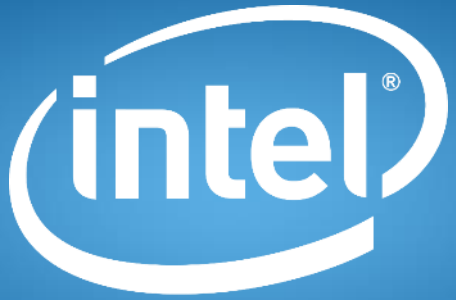
MEDIA FOUNDATION TRANSFORMS – MARS WINDOWS

- Intel custom transforms call Media SDK
  - Available as source code within the MARS release – expediting player software development
  - Decoder, Encoder, Custom Media Sink and compositor for presenting decoded frames
  - Video Post Processing (resizing, color conversion)
- Custom transforms provide more flexibility/control of the media pipeline
  - Some configurability from the GUI

MediaSDK is the focus of tomorrow's hands-on workshop

Feature Name	WINDOWS	Phase 1 Windows (Released Aug'17)	Phase 2 Windows (Q4'18)	Phase 3 Windows (2019)
Video Zone: Video Decode using HW & SW Acceleration with MSFT Media Foundation with Media SDK		√	√	
Video Post Processing using Media SDK		√	√	
Image & Audio Zones		√	√	
Ticker Tape		√	√	
RSS Feed		√	√	
Codecs		MPEG-2, AVC, HEVC (8/10b)	√	
Frame Rate		30fps, 60fps, 120fps	√	
Containers		MP4, MKV, MPEG2	√	
Multiple Screen Support		3 displays	√	
Benchmark using Intel® metrics framework		√	√	
Platforms		BSW, APL, SKL, KBL	Xeon	
HDR support on KBL			√	
HTML5 Zone			√	
Capture Card Streaming			√	
Dynamic Playlist Update			√	
Video Wall/Video Sync for 2x2, 2x3 configuration			√	
RTSP Streaming for new formats			√	
Transcode/Trans-rate			√	
Adaptive Streaming (MPEG-DASH)			√	
OpenVINO Integration (Video Analytics)				√

Feature Name	LINUX	Phase 1 Linux (Q4'18)	Phase 2 Linux (Scoping)
Video Zone: Video Decode using HW & SW Acceleration with FFMPEG via VAAPI or Media SDK		√	√
Video Post Processing (deinterlace) using FFMPEG-QSV		√	√
Image & Audio Zones		√	√
Ticker Tape		√	√
RSS Feed		√	√
Codecs		MPEG-2, AVC, HEVC (8/10b), MJPEG	√
Frame Rate		30fps, 60fps	√
Containers		MP4, MKV, MPEG2	√
Multiple Screen Support		3 displays	√
Benchmark using Intel® metrics framework		√	√
Platforms		APL, SKL, KBL	Xeon
HDR support on KBL			√
HTML5 Zone			
Capture Card Streaming			√
Dynamic Playlist Update			
Video Wall/Video Sync for 2x2, 2x3 configuration			
RTSP Streaming for new formats			√
Transcode/Trans-rate			√
Adaptive Streaming (MPEG-DASH)			√
OpenVINO Integration (Video Analytics)			√



experience
what's inside™