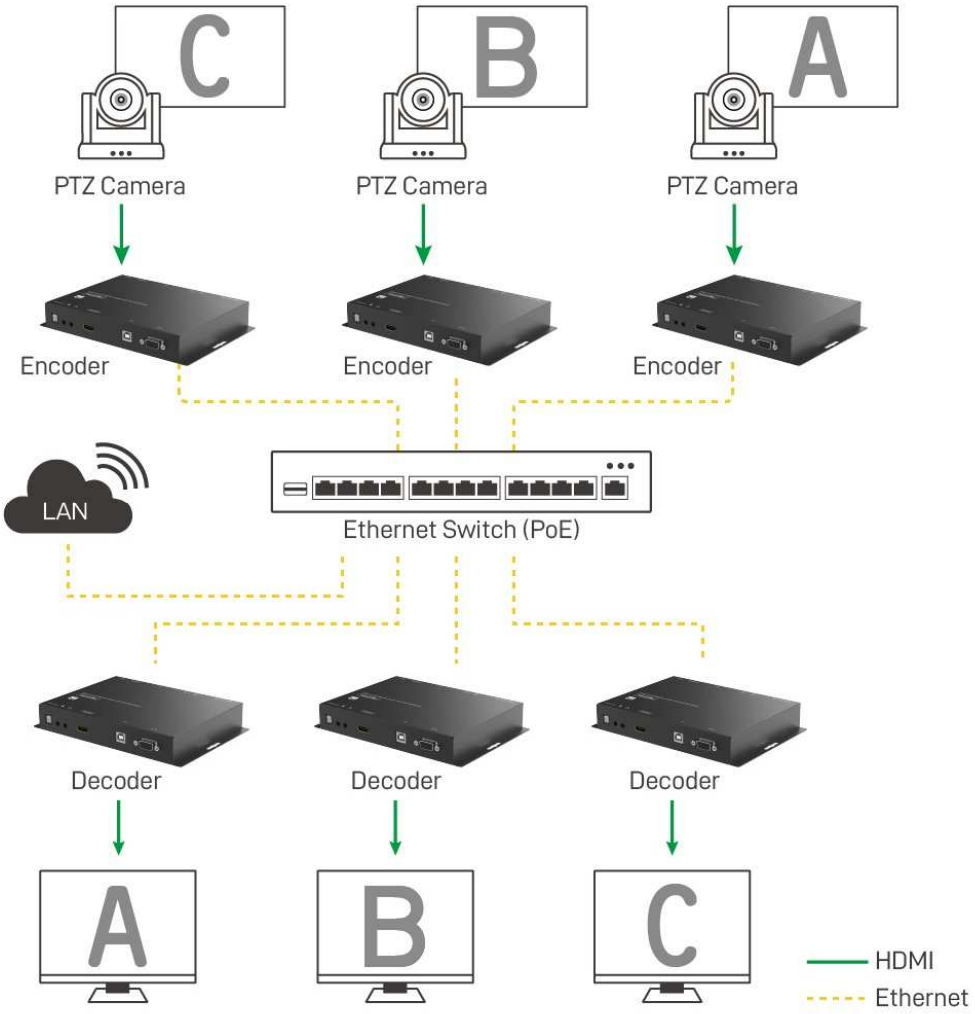
The Next Evolution: O1Stream

Unleashing the New Era of AV Extension

www.o1stream.com

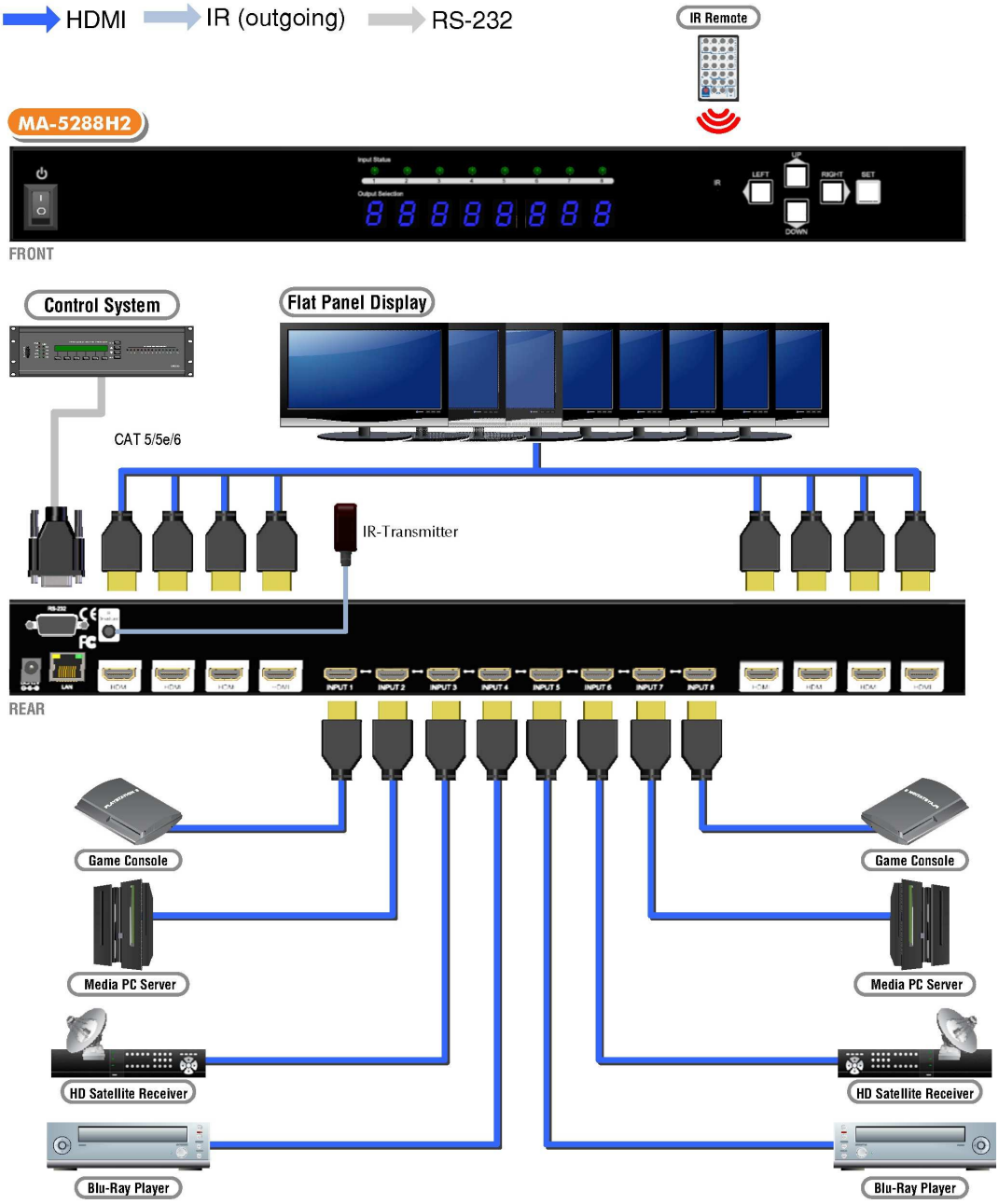
AV OVER IP: MARKET LANDSCAPE

Pivotal and game-changing are terms aptly used for transformative technological shifts. These terms are especially fitting when discussing the new era of AV transmission. AV over IP has transitioned from emerging to dominating and reshaping the AV landscape. HDMI 2.0 is a prominent player in this change, and this evolution also incorporates crucial I/O interfaces such as IR, GPIO, and mid-range USB speeds.



A significant advantage of AV over IP is its effortless integration with existing Ethernet infrastructures. Instead of undergoing complete system overhauls, organizations can simply upgrade their current networks. Although the initial cost of AV over IP devices for HDMI 2.0 is already competitive, the technology we are introducing will drive these costs even lower. In contrast to HDMI matrix systems or CAT 5-based systems, which come with hidden expenses such as extensive cabling, custom installations, and regular maintenance, AV over IP minimizes these costs. The installation process is more straightforward, reducing the need for highly specialized technicians, leading to a more efficient setup.

In past years, HDMI matrix switches or splitters over CAT-5 were the premier solution for AV distribution for many applications. They required complex cabling and specialized hardware to connect multiple HDMI sources to various displays. However, with the increasing need for flexibility and scalability, HDMI 2.0 over IP began its ascent. AV over IP shines especially in large environments like conference centers, educational institutions, and entertainment venues. Its ability to deliver crystal-clear high-definition signals over vast distances with minimal latency is unmatched. The benefits are clear: simpler installations, unparalleled scalability, and long-range high-definition signal transmission with minimal latency. This isn't a passing trend; it's the direction in which the industry is heading.



As HDMI 2.0 over IP gains popularity as a dominant interface for AV over IP, a myriad of technological solutions has emerged in the market to support its functionality. Notable among these are protocols such as NDI, Dante AV Ultra, and the popular ASIC SOC, including the AST1530. Furthermore, other solutions like Crestron NVX or Extron NAV further highlight the diverse range of available options in this rapidly evolving domain [1][2][3][4][5].

Indeed, the evolution of AV distribution is monumental, emphasizing the ever-

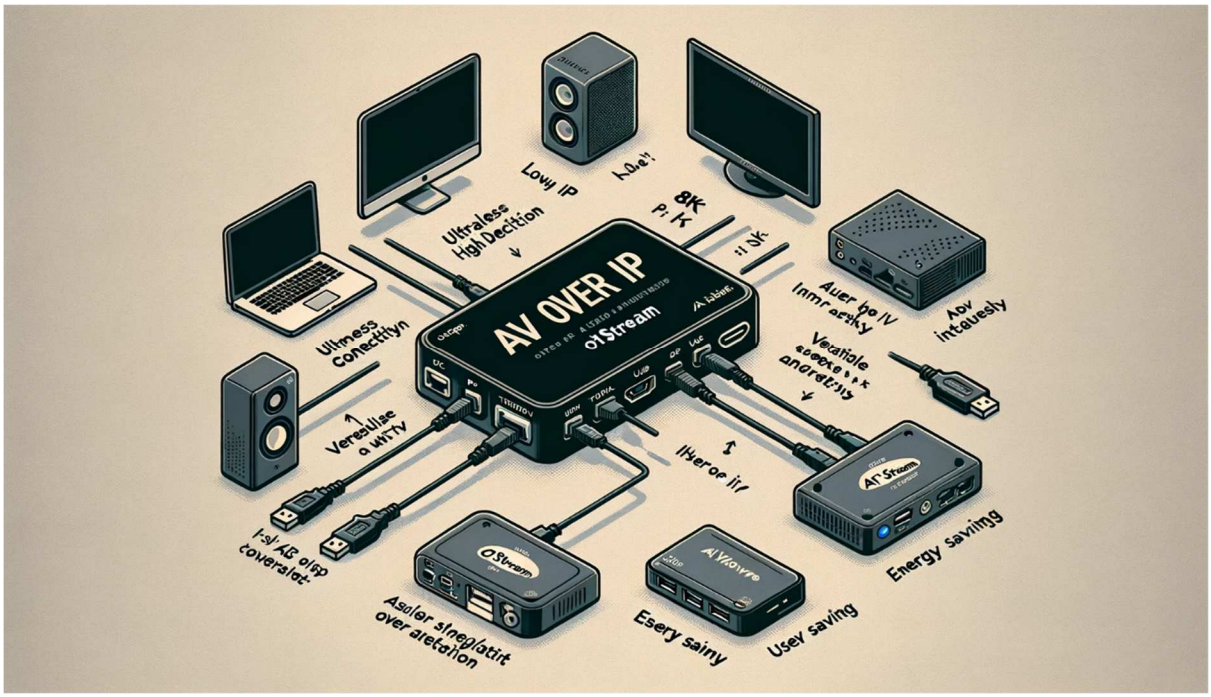
growing importance of the HDMI interface. As HDMI cements itself as an indispensable interface, AV over IP inherently capitalizes on this momentum. The adoption and integration of advanced protocols, including NDI, DanteAV Ultra, and Aspeed's AST1530, are testament to this synergy. Thus, as HDMI continues its ascent in importance, AV over IP, equipped with these technologies, stands ready to meet the diverse and expanding needs of the industry.

Feature/Factor	EX-57AP(Aspeed)	AVP-57FC (SDVoE)	DM-NVX-D30 (Crestron NVX)	Dante AV Ultra
Resolution Support	Up to 4K2K@60 4:4:4 8bits	Up to 4K@60 4:4:4	4K60 4:4:4	Up to 4096x2160@60Hz; RGB 4:4:4 @ 8 bit
HDR Support	Yes (High Dynamic Range)	Yes	HDR10, HDR10+, Dolby Vision®	Not specified
Latency	< 8 ms (for 2160p @ 60 Hz)	<100us for 4K2K@60 4:4:4	Real-time video performance	< 8 ms (for 2160p @ 60 Hz)
Compression	Proprietary MJPEG	Lite compression	Pixel Perfect Processing technology	JPEG2000
Audio Support	Basic	Uncompressed 7.1ch, DTS-HD Master Audio, Dolby TrueHD	7.1 surround sound, AES67 audio embedding and de-embedding	Dante Audio over IP
IR Support	Full frequency	Bi-directional	Yes, also RS-	Visca serial control

Feature/Factor	EX-57AP(Aspeed)	AVP-57FC (SDVoE)	DM-NVX-D30 (Crestron NVX)	Dante AV Ultra
	(20KHz to 60KHz)	(20KHz to 60KHz)	232, and CEC	over IP
Network Integration	Integrated port for 1G LAN, IGMP Snooping support	10 Gigabit Ethernet	Gigabit Ethernet with enterprise-grade security (802.1X, TLS, AES-128)	Unicast or Multicast
Software Support	Built-in web pages, 3rd party software, upgradable	Configuration, upgrade, and switching operation	Built-in web pages, XiO Cloud® service, AV Framework™ technology	Dante Controller
Switching	fast switching	Seamless switching	Automatic point-to-point connectivity	Seamless switching
Video Wall & Multi-view	Video Wall、PiP	Video Wall & Multi-view with compensation of frame-tearing	Video Wall	Video Wall
Custom Scaling	Yes	Yes	Yes	Yes
USB Support	Flash driver (USBoIP), keyboard/mouse	USB1.1 (Recommended Cat-6A or better)	Icron USB 2.0	Not specified

Feature/Factor	EX-57AP(Aspeed)	AVP-57FC (SDVoE)	DM-NVX-D30 (Crestron NVX)	Dante AV Ultra
	(KMoIP), webcam & audio device			
HDCP Compliance	2.2	2.2	2.3	HDCP 2.2 input/output, HDCP 2.3 over network

LIMITATIONS AND BOTTLENECKS FACED BY USERS AND PROVIDERS OF AV SOLUTIONS: FOCUSING ON HDMI 2.0 OVER IP



In the expanding domain of audio-visual transmission, AV over IP solutions have emerged as a prominent technology. While their adoption signals a significant advancement in AV distribution, several limitations and bottlenecks persist, hampering the full realization of their potential.

Bandwidth Limitations: Most of HDMI 2.0 over IP solutions mainly operating on a 1G Ethernet infrastructure predominantly rely on JPEG-based codecs for video compression. These codecs, while efficient, consume significant portions of the available bandwidth. Specifically, transmitting high-quality content can utilize approximately up to 850 Mbps of the 1Gbps available. This leaves limited room for additional data or any unforeseen overheads.

Resolution Constraints: One of the primary challenges faced by HDMI 2.0 over IP

is the resolution limitation. While it is equipped to handle 4K transmission, the dynamic growth of display technology, with 8K and beyond on the horizon, presents an impending constraint. As content creation tools and display technologies advance, HDMI 2.0 over IP's capacity to manage higher resolutions remains a concern.

Latency Issues: In real-time applications, especially in sectors like gaming or live broadcasting, latency plays a pivotal role. Any delay, even if it's just a few milliseconds, can drastically affect user experience. HDMI 2.0 over IP, despite its strengths, still grapples with latency issues, particularly in scenarios demanding instantaneous data transmission.

Scalability Concerns: While HDMI 2.0 over IP promises scalability, real-world implementations sometimes encounter bottlenecks when trying to expand the network. Whether it's adding more devices or extending the reach, scalability isn't always seamless.

Evolving Video Frame Rates: The AV industry is witnessing an increase in frame rates, especially in the gaming sector where rates of 120Hz or even 144Hz are becoming standard. These higher frame rates demand more data throughput. Consequently, the bandwidth consumption for such high-frame rate transmissions is considerably intensified, putting additional strain on the available bandwidth.

Security Implications: Transmitting HDMI 2.0 content across IP networks inherently raises issues related to content protection and overall security. While safeguarding the source with HDCP is vital, it's equally important to bolster security during transmission. Implementing measures like AES256 encryption can further enhance protection against unauthorized access or potential eavesdropping

Cost Considerations: Premium HDMI 2.0 over IP solutions that effectively tackle the highlighted concerns often come at a premium price. Many of these solutions rely on costly FPGA implementations or necessitate numerous components.

Without comprehensive integration of these essential functions, the final product's cost escalates. This elevated cost acts as a barrier, hindering the widespread adoption of AV over IP.

Overwhelming Feature Sets: AV over IP solutions come packed with a myriad of features, each offering its own unique advantage. However, without a well-designed and intuitive control software, managing and utilizing these features can become a cumbersome task. The presence of a user-friendly interface is paramount to ensure that users can harness the full potential of the system without feeling overwhelmed.

Energy Consumption: Many AV over IP solutions on the market are notably power-intensive. This not only leads to escalating operational costs but also contributes to a larger environmental footprint. As organizations and consumers become increasingly eco-conscious, the demand for energy-efficient solutions is paramount. The heightened power usage of traditional AV over IP devices underscores the urgent need for innovations that prioritize energy savings without compromising on performance.

In the rapidly evolving world of AV over IP, 1G solutions have been pivotal in showcasing a slew of benefits. Yet, as video frame rates soar and codecs demand ever-greater bandwidth, we're confronted with a set of pronounced challenges. Beyond the inherent limitations of HDMI 2.0, there are intricacies in system management and alarming concerns over energy consumption. It's clear the industry is echoing a need for a revolutionary change. Enter our trailblazing solution, O1Stream: Only One Stream, deeply rooted in HDMI 2.1. This isn't merely an upgrade—it's an advanced, future-proof transformation poised to redefine the AV over IP domain. O1Stream promises unparalleled video quality, ultra-low latency, and a suite of rich features. With unique capabilities like USB 3.0 over IP, 4K transceiver, advanced proprietary video codec, and PTP precision in packetization, we're pushing boundaries. Moreover, the support for 8K, anti-frame tearing technology for TV walls, latency control, multi-view KVM, and UVC to HDMI further set our offering apart. This comprehensive suite of features ensures an

unmatched experience, propelling the industry into a new era of AV innovation.

INTRODUCING O1STREAM: THE FUTURE OF HDMI 2.1-BASED CHIPSET TECHNOLOGY REAM

In the ever-evolving realm of audio-visual transmission, O1Stream emerges as a breakthrough HDMI 2.1-based chipset technology, uniquely engineered to transcend the limitations posed by HDMI 2.0 over IP. Designed with a futuristic vision and unprecedented capabilities, O1Stream exemplifies the epitome of AV over IP solutions.

While HDMI 2.0 over IP marked significant milestones in the AV world, it also came with inherent limitations such as resolution constraints, complexities in system management, and energy consumption concerns. The industry's aspiration was a transformative solution that would not only address these specific challenges but also redefine the boundaries of AV over IP. O1Stream, deeply embedded in HDMI 2.1, is that revolutionary answer. Beyond remedying the constraints of HDMI 2.0, it introduces a plethora of innovative features, setting a new benchmark for AV excellence.

At the heart of O1Stream's exceptional capabilities lies its genuine SoC design, powered by a high-speed dual ARM big core CPU, delivering unparalleled processing power. Even though specific details about the package, process node, CPU cache, DDR, and PCIe are yet to be unveiled, the chipset's integrated functionality already distinguishes it. By consolidating numerous components and features into a single chip, O1Stream showcases the potential to redefine efficiency and streamline AV over IP operations.

Video Decoding and Encoding: O1Stream boasts impressive video decoding capabilities, supporting up to 4K120 4:2:0 or 4K60 4:4:4 & 4K60 4:2:2, 2K60 4:2:0,

and MJPEG at similar resolutions. Correspondingly, its video encoding matches this prowess, ensuring top-tier transmission quality with adjustable bit rates, which can range from 25Mbps to a whopping 250Mbps. These specifications hint at a chipset designed for versatile applications, from broadcasting to high-end gaming.

HDR and Audio Support: Where O1Stream truly stands out is in its extensive HDR support, including HDR10, HDR10+, Dolby Vision and HLG passthrough. This ensures visual content is rendered with breathtaking clarity, depth, and color spectrum. Complementing this visual marvel is comprehensive audio support, capable of handling PCM with 8 channels up to 192KHz and 24 bits. The chipset can also gracefully handle non-PCM formats like DTS and Dolby Digital passthrough.

Connectivity and Security: O1Stream comes equipped with HDMI 2.1 input and output capabilities, reaching up to 12Gbps*4Lanes, ensuring a seamless connection to the latest AV devices. An emphasis on security is evident with HDCP1.4/2.2/2.3 keys and a suite of encryption tools including AES256, DES, TDES, SHA1, SHA256, and more.

Latency and Scalability: One of the standout features of O1Stream is its promise of video latency less than 1 frame, addressing one of the significant challenges of HDMI 2.0 over IP. The chipset is also primed for scalability with features like its PiP Engines, which supports up to 3 videos, and Video Wall capabilities that allow for synchronized video wall applications of up to 16x16.

In conclusion, O1Stream is not just an iteration; it's a leap. By addressing the challenges of HDMI 2.0 over IP and introducing a suite of advanced features, it promises to redefine the AV over IP landscape. Whether it's enhanced video/audio quality, unprecedented scalability, or reduced latency, O1Stream positions itself as the future-ready solution, setting new benchmarks for the industry. For those keen on delving deeper into the specifics, detailed SoC specifications are readily available in the appendix A.1 to provide a comprehensive understanding of its

capabilities.

COMPARING O1STREAM TO LEGACY UNCOMPRESSED HDMI EXTENSION OVER CAT5 CABLES AND HDMI 4K/60 OVERIP SOLUTION

The AV extension market has consistently evolved, with various technologies making their mark. Uncompressed legacy Cat5 extender, in particular, has been a significant player over the past decade. Its importance is underscored by its widespread adoption across diverse sectors, from commercial and residential to industrial applications. This point-to-point solution, though distinct from ethernet and over IP configurations, highlights its substantial market niche and influence. On the other hand, technologies like Dante AV or NDI, which utilize FPGA architectures, deviate from our core focus on SoC solutions tailored for 1G Ethernet. With the vast majority of the current infrastructure supporting 1G, it remains the popular choice. Moving to 10G, despite its potential advantages, demands superior cabling and comes with heightened costs. It's less about increasing bandwidths and more about intelligently optimizing what's already widespread. Harnessing the power of codecs on 1G infrastructure is the strategic way forward, blending cost-efficiency with extensive adoption, ensuring 1G's reign for the foreseeable future.

1. **O1Stream:**

ASIC SOC

	New ASIC
HDMI Spec	HDMI 2.1
Proprietary video codec bandwidth	25~400M

USB 3.0 bandwidth	Fully adjustable
Alt-Mode (DP)	V
AES encryption level	256
PiP number	up to 3
3 encoder engines	Proprietary
UVC support	V
Transcodec	V
Scalers	3
Video Rotatoin	V
Video De-interlacer	V
Chroma Keying	V
Record / Playback	V
Transceiver device	V
Audio rate convrsion	V
Audio Downmix	V
AES67	V
VRR support	V
KVM over IP /w Mouse Roaming	V
TV wall frame sync & delay	V
Customized Security Key support	V
HDR to SDR	V
MAC/Line I/O	V
SPDIF I/O	V
I2S I/O	V
eARC/ARC	V
UART/IR(Bi-directional)	V
I2C, SPI	V
Free GPIO	8
SDK available	V

O1Stream is a versatile HDMI 2.1-based chipset solution designed to overcome the limitations of HDMI 2.0 over IP. It boasts support for high-quality video formats like 4K120 and offers impressive video latency of less than one frame. Supports HDMI 2.1 inputs, making it compatible with the latest generation of AV

equipment. Offers a comprehensive suite of features, including HDR support, rotation/flip capabilities, video wall support, and audio-video synchronization. Provides robust security measures like DES, TDES, and AES encryption.

Applications: Given its extensive feature set, O1Stream series is suitable for high-demand scenarios like professional broadcasting, digital signage, large conference setups, and entertainment venues.

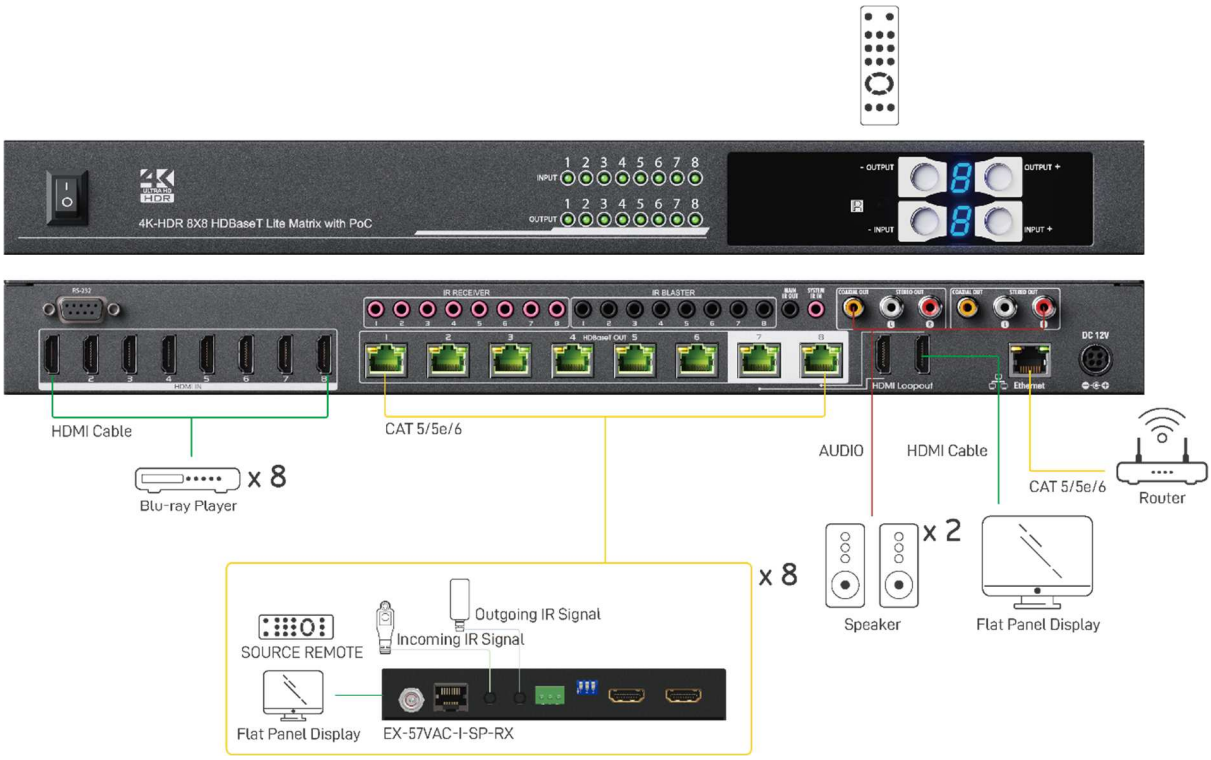
2. **Uncompressed legacy Cat5 Extender:**

O1STREAM VS UNCOMPRESSED LEGACY CAT5 SOLUTION

	Uncompressed legacy Cat5 Solution	O1Stream
HDMI standard	HDMI 1.4	HDMI 2.1
Video Latency	~0 ms	<1 frame
Ethernet Router【Distribution】	X	V
Bandwidth	10G Uncompressed< 4K30 Compressed > 4K30	25~400M
USB 3.0 over IP bandwidth	X	Fully adjustable
Alt-Mode (DP)	X	V
AES encryption level	X	256
VRR support	X	V
PiP number	X	up to 3
3 encoder engines	X	Proprietary
UVC support	X	V
Transcodec	X	V
Scalers	X	3
Video Rotation	X	V
Video De-interlacer	X	V
Chroma Keying	X	V
Record / Playback	X	V
Transceiver device	X	V
Audio frame conversion	X	V
Audio Downmix	X	V

AES67	X	V
KVM over IP /w Mouse Roaming	X	V
TV wall frame sync & delay	X	V
Customized Security Key support	X	V
HDR to SDR	X	V
Microphone/Line I/O	X	V
SPDIF I/O	X	V
I2S I/O	X	V
eARC/ARC	X	V
UART/IR(Bi-directional)	V	V
I2C, SPI	X	V
Free GPIO	X	V
SDK available	X	V

Uncompressed legacy Cat5 Extender, born out of the need to simplify AV installations, transmits uncompressed ultra-HD video, audio, power, and control signals over a single cable for up to 100 meters. Simplified infrastructure as it requires only a single cable. Well-established and widely adopted, ensuring compatibility with a range of devices. Offers up to 100m of transmission with zero latency.



Applications: Uncompressed legacy Cat5 Extender is popular in settings that require uncomplicated setups with minimal cables, such as meeting rooms, classrooms, and home theaters.

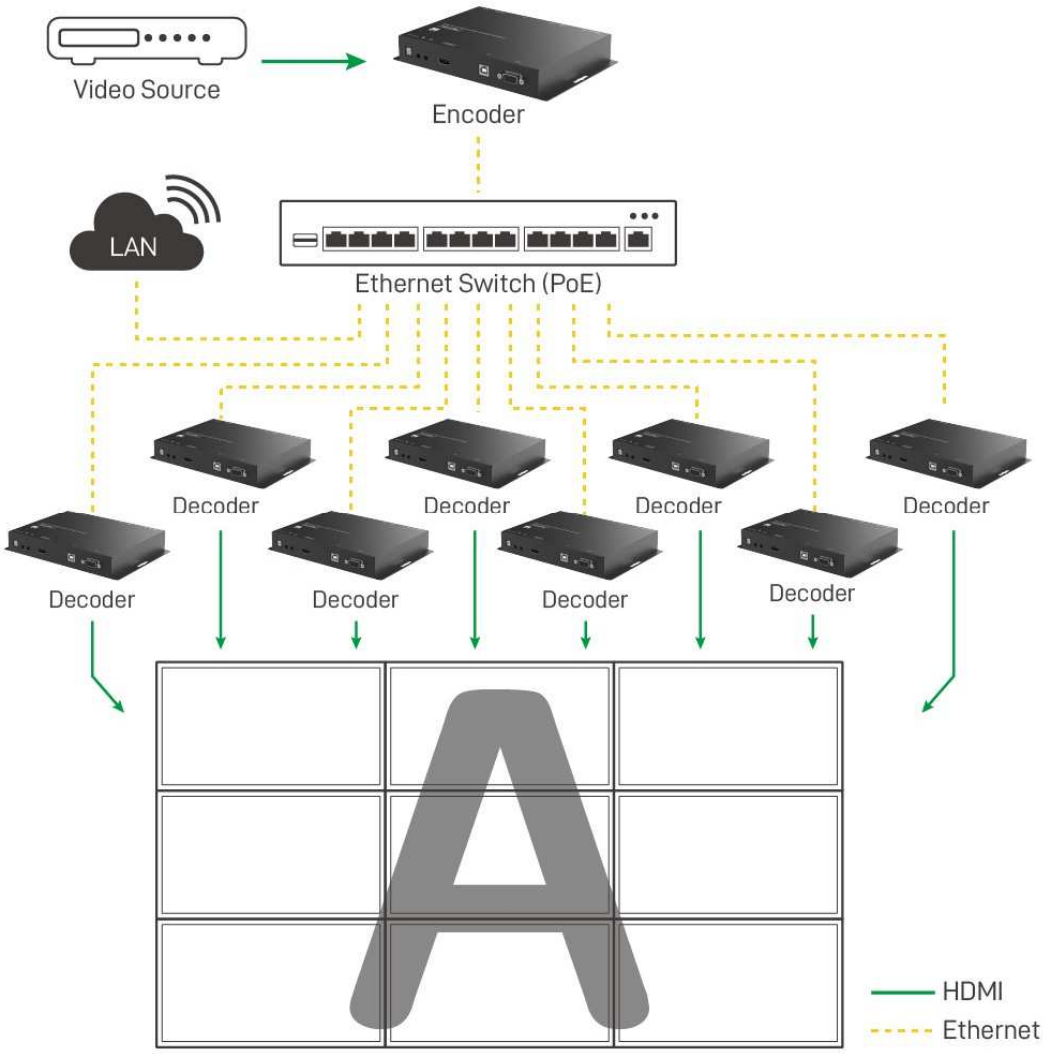
3. Popular 1Gbps HDMI 4K over IP Solution:

O1STREAM VS POPULAR 1GBPS HDMI 4K OVER IP SOLUTION

Unnamed: 0	Popular 1Gbps Solution	O1Stream
HDMI SPEC	HDMI 2.0	HDMI 2.1
Video Latency	<1 frame	<1 frame
PSNR evaluation 【dB】*	~25	~40
Proprietary Codec bandwidth	~800M	25~400M
Video Codec Support	X	Proprietary
Max Video resolution Support	4K60 444	8K30 444/8K60 422 (DSC)
USB bandwidth	USB 2.0, up to 320M	Fully adjustable
Alt-Mode (DP)	X	V
AES encryption level	X	256
PiP number	X	up to 3
Encoder engines	2(MJ+MJ)	Proprietary
VRR support	X	V
UVC support	X	V
Transcodec	X	V
Scalers	Limited	3
Video Rotation	V	V
Video De-interlacer	X	V
Chroma Keying	X	V
Record / Playback	X	V
Audio rate conversion	X	V
Audio Downmix	X	V
AES67	V	V
4Tx/1Rx KVM over IP /w Mouse Roaming	X	V
TV wall	V	V
TV wall frame sync & delay	X	V
Customized Security Key support	X	V
HDR to SDR	X	V

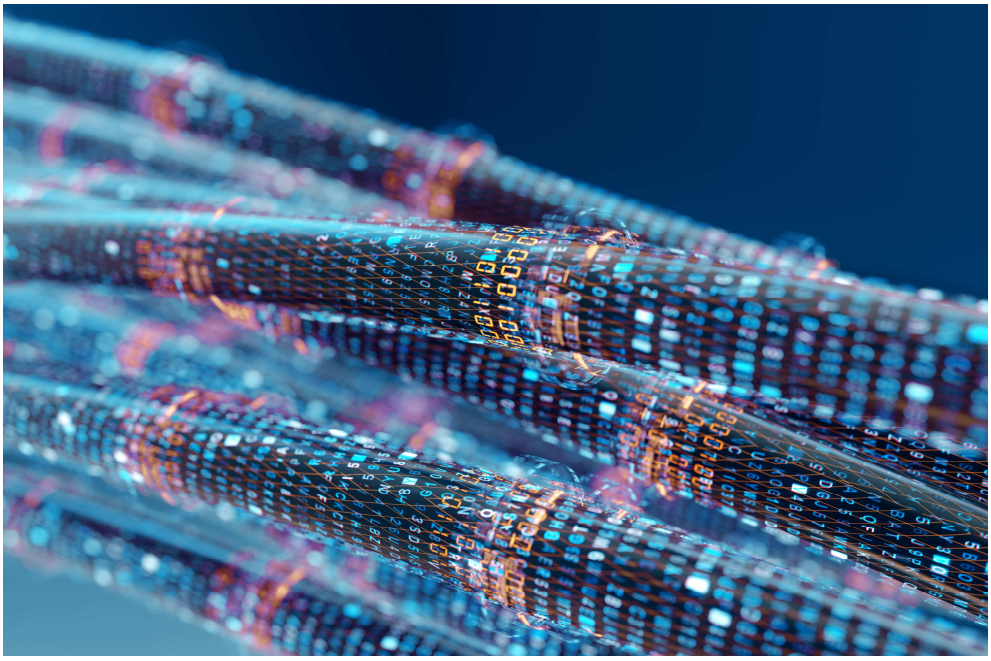
MIC/Line I/O	V	V
SPDIF I/O	V	V
I2S I/O	V	V
eARC/ARC	V	V
UART/IR(Bi-directional)	V	V
I2C, SPI	V	V
Free GPIO	V	V
SDK available	V	V
*SDVOE Pattern		

The popular 1Gbps solution developed to address the increasing demands of AV-over-IP solutions, offers support for up to 4K2K60 resolution, encompassing features like HDR10/10+ and Dolby Vision. With HDCP2.2/2.3 compatibility, it ensures seamless content protection. Its strength lies in its ability to transmit high-quality video, audio, and control signals with robust performance. Designed for advanced Video Wall rotation functionalities, it presents diverse capabilities in a single SoC platform.



Applications: Currently, the popular 1Gbps solution is ideally suited for environments seeking high-definition AV-over-IP solutions, such as corporate presentations, digital signage, entertainment venues, and advanced home entertainment systems [6].

O1STREAM'S POTENTIAL MARKET IMPACT: A GLIMPSE INTO THE FUTURE OF AV OVER IP



As the AV over IP industry steers towards more sophisticated solutions, the introduction of O1Stream has the potential to significantly reshape the market dynamics. Here's a brief analysis of the expected market impact and the competitive advantages that O1Stream could introduce:

Superior Quality: As the display technology world transitions towards 4K and 8K standards, the ability to transmit these high resolutions becomes imperative. O1Stream is perfectly equipped to handle transmissions up to 8K60 and 4K120, ensuring users get the best visual experience possible. But high resolution alone isn't the benchmark for quality; post-compression visual clarity is equally vital. O1Stream is committed to delivering outstanding video quality, even after compression. By providing picture quality comparable to SDVoE, and even boasting similar or superior Peak Signal-to-Noise Ratio (PSNR), O1Stream stands out as a top contender in the AV over IP domain.

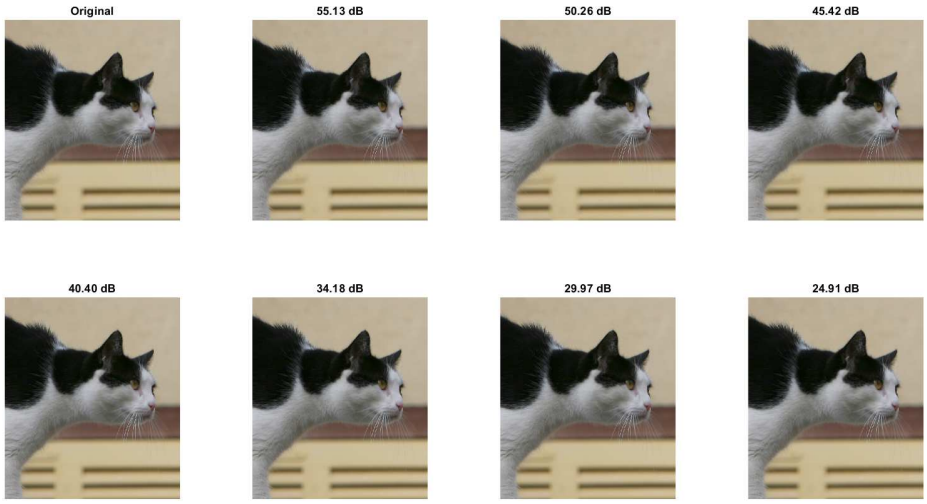
PSNR = 10 × log10(MAX^2 / MSE)

Where:

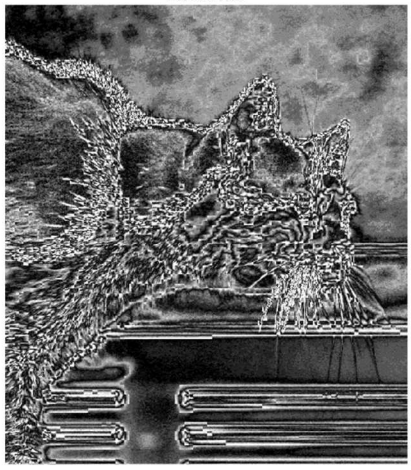
MAX is the maximum possible pixel value of the image.

MSE is the Mean Squared Error between the original and compressed image.

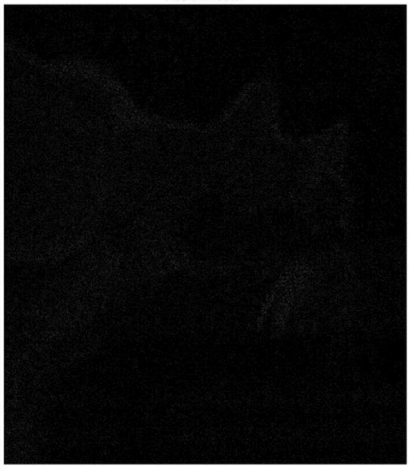
While various PSNR performance examples are provided below, discerning differences becomes challenging, especially when the PSNR variance exceeds 20dB. However, by juxtaposing the distorted image with its original counterpart and highlighting the errors, the information loss becomes more evident.



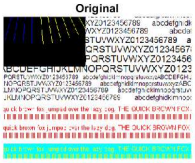
Abs Diff: 35dB



Abs Diff: 55dB



Original



51.80 dB

50.02 dB

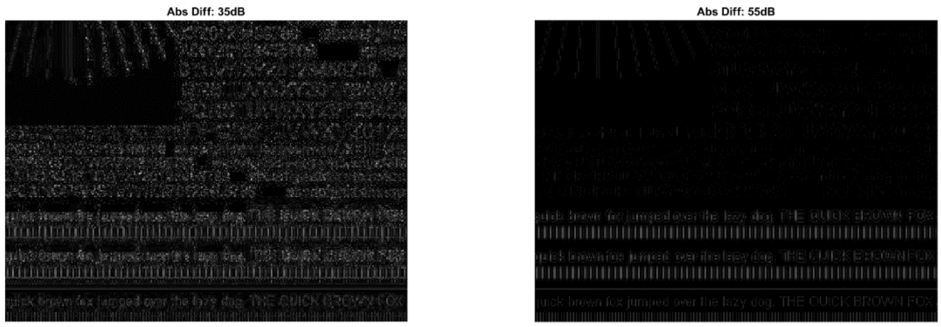
44.92 dB

40.32 dB

35.49 dB

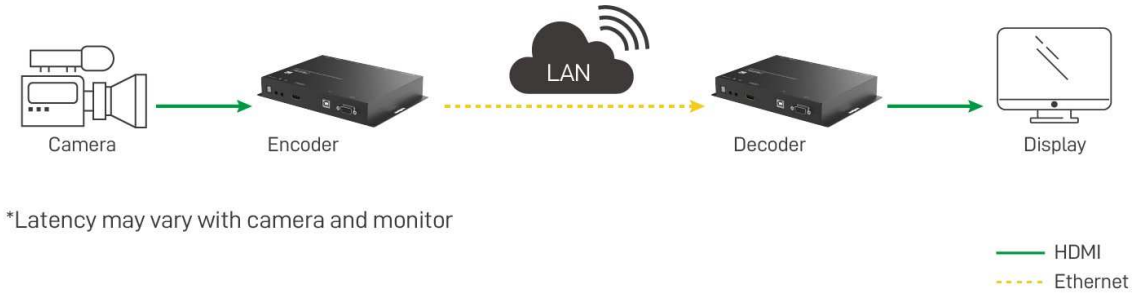
30.45 dB

27.59 dB



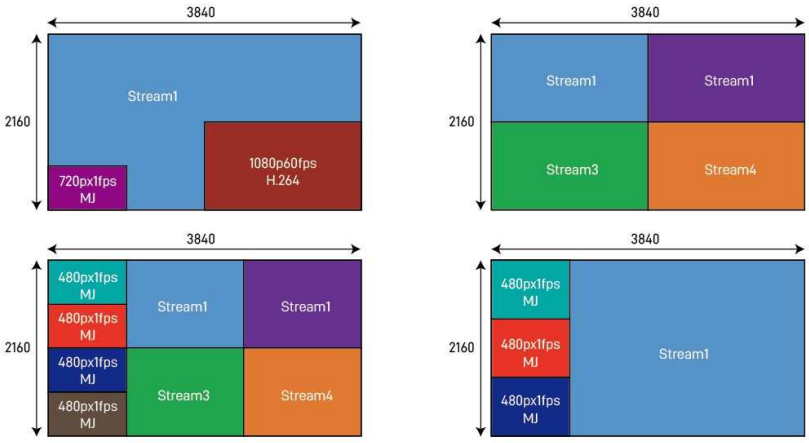
Low Latency: While proprietary video codec is indeed applied in the field, it brings with it the potential for exceptional video compression efficiency. Given this complexity, it's natural to anticipate some degree of latency during encoding and decoding processes. However, our commitment at O1Stream is to push the boundaries of what's possible with the proprietary video codec. Despite the intrinsic challenges, we pledge to optimize the codec's performance to achieve ultra-low latency, maintaining it at less than one frame at the glass-to-glass level. Our aim is to combine the best of both worlds: the advanced compression capabilities of the proprietary video codec and the swift responsiveness demanded by real-time applications.

Glass to Glass latency <1 frame

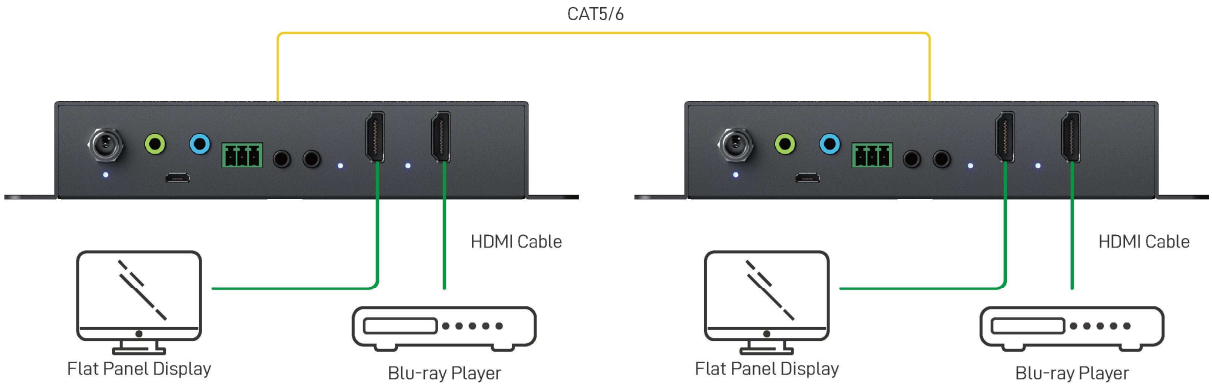


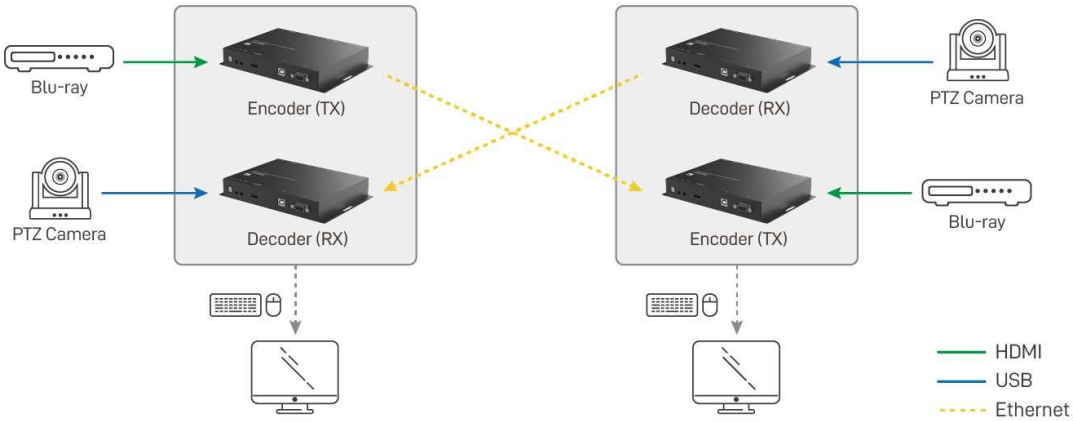
Comprehensive Solutions: Few solutions in the market offer the breadth of capabilities that O1Stream does, from advanced HDR support to comprehensive security features. This makes O1Stream not just a product but a comprehensive AV solution.

Scalability and Flexibility: O1Stream's extensive feature set, from PiP capabilities to synchronized video wall applications, means it can cater to a variety of business sizes and needs, from small setups to expansive commercial applications.



Full Duplex Transceiver: The inclusion of a full duplex Transceiver in our new system-on-chip (SoC) offers a distinct edge. Apart from FPGA solutions, it's quite rare to find such a transceiver integrated into an SoC. This unmatched feature opens the door to a plethora of applications. It enables bidirectional real-time communication, even at Ultra-High Definition (UHD) video quality. The potential applications are vast, spanning sectors from manufacturing to automation, and even medical solutions related to challenges like the COVID-19 pandemic.





Adjustable Video Codec Bandwidth: Adjustable proprietary video codec bandwidth plays a pivotal role in ensuring efficient network management, especially when dealing with various applications. By allowing different priorities for bandwidth allocation to distinct applications such as video, I/O, and USB, it offers a flexible approach to network resources. The innovative design of the new SoC ensures minimal consumption of ethernet bandwidth. This design feature is particularly beneficial for AV over IP operations, allowing it to seamlessly integrate into daily ethernet environments. One of the standout implications of this adjustable bandwidth is that it won't monopolize the entire network bandwidth, ensuring other daily tasks over ethernet continue without disruptions. In essence, the SoC ensures a balanced and smooth operation of both specialized AV tasks and routine ethernet functions. Importantly, with this advanced setup, we do not necessarily require another set of router for AV over IP alone.

USB over IP: USB over IP stands out as a transformative technology in the realm of AV over IP. Not only does it support the full 480 Mbps offered by USB 2.0, but it also elevates this capability by supporting USB 3.0 class devices, such as high-speed storage, with bandwidths up to 1.0 Gbps. Moreover, the bandwidth for both USB 2.0 and 3.0 is adjustable, allowing for a more tailored approach to data transfer based on the specific needs of the application. This versatility ensures

that AV over IP isn't just confined to audio and video streaming. It's about a broader range of data transfer functionalities. The addition of USB 3.0 support, especially for high-speed storage devices, presents a myriad of opportunities and use cases, setting our SoC apart from other offerings in the market. In essence, USB 3.0 over IP transcends traditional boundaries, introducing possibilities that redefine what AV over IP systems can achieve.

HDMI 2.1 Future-Proofing: Embracing the cutting-edge capabilities of HDMI 2.1, O1Stream offers remarkable HDMI 2.1 future-proofing advantages, such as 4K120/8K60, eARC, VRR &HDR, distinctly positioning itself ahead in the competitive landscape. This foresight guarantees users a wise investment in a technology designed for longevity and relevance. Within residential settings, the prowess of O1Stream, especially when utilized as point-to-point extenders, unlocks a myriad of applications. Homeowners can seamlessly connect gaming consoles to displays across rooms, ensuring high-resolution gameplay without any compromise through already available 1G ethernet switcher. Multimedia enthusiasts can benefit from flawless streaming of ultra-high-definition movies or series from their media servers to home theaters situated in different parts of the house. Moreover, those working from home can set up multiple monitor workstations in various rooms, ensuring high-quality video conferencing or design

work using KVM over IP readily. In essence, O1Stream crafts a holistic, interconnected, and high-definition home experience, all the while promising a technology that stands the test of time.

SDR

Static HDR

Dynamic HDR

Broadening the AV over IP Industry: The AV-over-IP sector is undergoing a significant transformation, with indications of substantial growth in the ensuing years. Recent analyses suggest that the global AV-over-IP market was approximated at USD 4782.49 million in 2022, with projections indicating a Compound Annual Growth Rate (CAGR) of 58.85% in the upcoming years. This momentum is driven by an escalating demand for instantaneous communication and the adaptability of IP-based systems.

O1Stream, as a pioneering system-on-chip (SoC), embodies the future of this transformation. By integrating avant-garde technologies, such as HDMI 2.1 and compatibility with 8K60/4K120 resolutions, O1Stream sets a new benchmark in the realm of AV-over-IP. Such progressive features not only cater to current needs but also anticipate future requirements, ensuring that users are aligning with a technology that remains pertinent and cutting-edge. The incorporation of higher refresh rate solutions, coupled with Dynamic HDR support, emphasizes the potential and versatility of the O1Stream SoC.

In **residential settings**, the deployment of AV-over-IP solutions, powered by O1Stream, can revolutionize experiences ranging from home theaters and multi-room entertainment setups to advanced surveillance systems. The flexibility of

such systems guarantees uninterrupted connectivity, delivering optimal performance without compromising on quality. As the industry continues to evolve, it becomes evident that enhancing user experiences, scalability, and ensuring a seamless fusion of technologies will be paramount, marking the AV-over-IP sector as a dominant force in the digital communication landscape[7][8].

Flexible software development in Linux: In an era where adaptability and customization are at the forefront of technological advancements, O1Stream's new SoC offers a paradigm shift in flexible software development possibilities. Powered by a dual-core A73 architecture running at a brisk 1.2GHz, the SoC is not just about raw computational power, but also about the versatility it brings to the table. Central to this versatility is its robust support for the Linux kernel. Linux, with its open-source nature, offers developers a vast ecosystem to build, adapt, and innovate. Whether it's real-time processing, network management, or any domain-specific application, O1Stream's SoC provides the foundational hardware that can seamlessly dovetail with Linux's expansive software libraries. This symbiosis between hardware and software ensures that developers can tailor

solutions specific to end-user requirements without being constrained by proprietary systems. Moreover, the combination of O1Stream's advanced hardware capabilities, such as HDMI 2.1 support and compatibility with 8K60/4K120 resolutions, with Linux's software ecosystem, paves the way for a myriad of multimedia applications. Be it streaming, gaming, or immersive VR experiences, the potential applications are vast and varied. The intrinsic flexibility offered by Linux also means that security patches, software updates, and new features can be rolled out efficiently, ensuring that O1Stream remains at the cutting edge of AV over IP solutions. This dynamic adaptability reinforces O1Stream's commitment to not just meeting but exceeding industry standards, thereby bolstering its potential to reshape the AV over IP landscape.

Building the O1Stream Community: As the digital landscape continues to evolve, the vision for O1Stream is not just about pioneering a state-of-the-art SOC but also about fostering a vibrant community around it. This community wouldn't be bound by formal associations or memberships, making it distinct from traditional groups. Instead, the essence of the O1Stream community lies in its organic nature, drawing in enthusiasts and innovators who see the potential in the SOC. These adopters, driven by SOC real values and passion, will be at the forefront of leveraging the SOC's capabilities, pushing boundaries, and setting new standards. As they explore diverse applications and create groundbreaking solutions, the

community will serve as a melting pot of ideas and a hub for innovation. Through mutual learning and collaboration, the O1Stream community will not only drive product excellence across various fields but will also symbolize a new direction in how technology communities are conceived and nurtured.

In conclusion, the Audio-Visual over Internet Protocol (AV over IP) arena is characterized by relentless innovation and a drive to optimize communication experiences. As technology evolves, there arises a necessity for benchmarks that not only measure but also inspire higher standards of performance, quality, and security. In this evolving landscape, O1Stream emerges as a beacon of excellence, poised to redefine industry norms.

Equipped with an impressive array of features and advanced functionalities, O1Stream's SoC design embodies the next generation of AV over IP solutions. Its support for HDMI 2.1 and compatibility with cutting-edge 8K60/4K120 resolutions are testament to its commitment to deliver unparalleled visual experiences. Furthermore, with a focus on higher refresh rate solutions and Dynamic HDR support, O1Stream ensures that users are granted a visual experience that is both immersive and lifelike.

But beyond its technical prowess, O1Stream recognizes the paramount importance of security in today's interconnected world. As the AV over IP market surges, projected to achieve a Compound Annual Growth Rate (CAGR) of 58.85%, the need for secure and reliable solutions becomes more pronounced. O1Stream is designed with these challenges in mind, ensuring that data integrity and user privacy are never compromised.

In the broader context of the AV-over-IP sector, O1Stream's potential to set new benchmarks is not just about its advanced technical specifications. It's about envisioning a future where quality, performance, and security are intertwined, driving an industry forward that is both responsive to user needs and proactive in its innovations. As stakeholders and users alike navigate the exciting possibilities of the AV-over-IP domain, O1Stream stands as a testament to what is achievable

when technology is melded with ambition and vision.

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