



NEXT-LEVEL AV CONNECTIVITY: HOW O1STREAM IS LEADING INNOVATION

Considering our new SOC O1Stream and uncompressed legacy Cat5 extender, what are the primary challenges that O1Stream might face in its endeavor to become an alternative to the well-established uncompressed legacy Cat5 extender standard in the industry?

Established Market Presence of Uncompressed legacy Cat5 extender: Uncompressed legacy Cat5 extender has been around for years and has solidified its position in the industry. It has built a robust ecosystem of compatible devices and has strong brand recognition.

Ans: While uncompressed legacy Cat5 extender's longstanding market presence has cemented its role in the industry, technological advancements are reshaping expectations. O1Stream's compatibility with genuine Ethernet offers a more versatile and cost-effective infrastructure. Its forward-looking support for HDMI 2.1, in contrast to uncompressed legacy Cat5 extender's limitation to HDMI 2.0, makes it poised for future demands. Moreover, the impracticality of sending uncompressed 48 Gbps data over CAT cables underscores the need for innovative solutions like O1Stream. With a comprehensive suite of features encompassing TV wall, KVM, and USB 3.0 over IP, O1Stream presents itself as a technologically advanced alternative to uncompressed legacy Cat5 extender. It is designed to provide users with an additional option that brings in enhanced capabilities and flexibility, catering to the evolving needs of modern AV setups. The challenge lies not in the capabilities, but in shifting the industry's inertia from a familiar standard to a promising newcomer.

Infrastructure Transition: Transitioning to a new standard like O1Stream would mean overhauling existing infrastructure for many businesses, which could be costly and time-consuming.



Ans: Transitioning to O1Stream is a forward-looking decision that doesn't necessitate a major infrastructure upheaval. Existing cables installed for uncompressed legacy Cat5 extender can be seamlessly utilized by O1Stream, ensuring minimal disruptions. Moreover, by using standard 1G routers as distribution centers, businesses can optimize their setup costs and operational efficiency. This not only ensures a smooth switch but also capitalizes on familiar, existing infrastructure. Hence, O1Stream provides an evolutionary step forward, integrating the latest technology without the pains of a complete system revamp.

Compatibility & Integration Issues: Even though O1Stream might offer superior technical capabilities, it would need to ensure it integrates seamlessly with a vast array of devices and systems that currently work with uncompressed legacy Cat5 extender.

Ans: To facilitate a seamless integration between existing uncompressed legacy Cat5 extender systems and the advanced capabilities of O1Stream, we can design a compact O1Stream-to-uncompressed legacy Cat5 extender converter. This innovative solution is powered by a single SOC, ensuring efficiency and simplicity in design. Critically, O1Stream's support for HDMI 2.1 inherently encompasses HDMI 2.0 capabilities, offering users a comprehensive solution that addresses both current and future needs. The converter acts as a bridge, allowing businesses to leverage the benefits of O1Stream without compromising their existing uncompressed legacy Cat5 extender setups. This strategic approach ensures that organizations can transition at their own pace, maximizing their previous investments while positioning themselves at the forefront of AV over IP technology.

Industry Resistance to Change: Businesses often resist change due to the perceived risks and uncertainties associated with new technologies. The industry would need convincing evidence of the benefits of switching to O1Stream over the tried-and-tested uncompressed legacy Cat5 extender.

Ans: Change, especially in established industries, often comes with apprehension. However, when the advantages are clear and tangible, the transition becomes compelling. O1Stream isn't just a new technology; it's a forward-looking solution tailored

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for the evolving demands of the AV over IP realm. By supporting HDMI 2.1, O1Stream not only ensures compatibility with the latest AV equipment but also prepares businesses for future advancements. Coupled with features like TV wall, KVM, mixer, and USB 3.0 over IP, the value proposition becomes undeniable. Additionally, we're committed to providing comprehensive training, robust customer support, and real-world demonstrations to showcase the tangible benefits of O1Stream. By bridging knowledge gaps and addressing concerns head-on, we aim to turn industry resistance into enthusiastic adoption.

Potential Technical Challenges: As a newer technology, O1Stream might face unforeseen technical challenges or limitations in real-world deployment scenarios.

Ans: The path of innovation is paved with challenges, and O1Stream is equipped and ready to navigate them. As HDMI 2.1 continues to evolve, the industry, including O1Stream, is poised on the cusp of significant transformation. With emerging technologies like USB over IP and the avant-garde proprietary 4K120 video codec, there are bound to be growing pains. However, these hurdles are not unique to O1Stream but are universal challenges faced by all in this rapidly advancing sector. Our strength lies in our proactive approach: we rigorously test O1Stream across myriad scenarios, leverage feedback from early adopters, and invest heavily in R&D to preemptively address potential technical nuances. This iterative and adaptive methodology ensures that we not only meet but set industry benchmarks. Furthermore, our commitment extends beyond just providing a product; we offer an enduring partnership, comprehensive training, and steadfast support. With O1Stream, stakeholders are not merely keeping pace with the technological evolution; they're actively steering it, fortified with the confidence that they have a partner who understands and innovates amidst the challenges.

Lack of Awareness: The advantages of O1Stream need to be effectively communicated to the industry. Until there's broad awareness and understanding of its benefits, adoption might be slow.

Ans: To effectively address the lack of awareness surrounding O1Stream, a multi-pronged communication strategy is pivotal. Our adopters intend to roll out detailed www.o1stream.com



educational campaigns that elucidate O1Stream's technical prowess, especially when benchmarked against existing solutions. Interactive webinars and workshops will offer professionals a deep dive into its unique features. By distributing engineering samples, we're inviting industry stakeholders to experience its benefits firsthand, ensuring they can appreciate its real-world applications. Collaborations with respected industry influencers and thought leaders will augment our outreach, adding a layer of trust to our claims. Our active participation in major trade shows and conferences will provide a platform for live demonstrations, allowing potential adopters to see O1Stream in action. Through these concerted efforts, we aim to not only spread awareness but also inspire confidence in O1Stream's unparalleled capabilities.

Video Quality and Latency Concern: Given uncompressed legacy Cat5 extender's uncompressed nature ensuring zero latency, how does O1Stream's compressed solution maintain competitive video quality and responsiveness?

Ans: While uncompressed legacy Cat5 extender offers uncompressed transmission, theoretically resulting in zero latency, O1Stream utilizes the proprietary video codec for compression. This advanced codec ensures a high PSNR, making the compression virtually indistinguishable to the human eye, or "visually lossless." In terms of latency, O1Stream has been optimized to achieve less than one frame of delay, which, in practical real-world applications, is barely noticeable and remains competitive. The compression allows for more efficient bandwidth usage, making it feasible to transmit higher resolutions and richer content over the same infrastructure. Furthermore, the slight latency introduced by the codec is a trade-off for the manifold benefits O1Stream offers, including support for HDMI 2.1, adaptability for future video formats, and a suite of advanced features not available in uncompressed solutions.

Cost Implications: Even if O1Stream is more cost-effective in the long run, the initial transition could entail significant expenses. This might deter businesses from making the switch.

Ans: Addressing the concerns over cost implications requires a comprehensive understanding of the total cost of ownership, not just the initial expenses. While www.o1stream.com



transitioning to O1Stream might involve certain upfront costs, businesses need to consider the long-term savings and benefits. Firstly, O1Stream leverages the existing cabling systems used by uncompressed legacy Cat5 extender, which means there's no need for a costly infrastructure overhaul. This compatibility significantly reduces the barriers to adoption. Furthermore, as O1Stream is designed to be future-proof, especially with its HDMI 2.1 support, businesses won't face frequent, expensive upgrades as technology evolves. Additionally, O1Stream's diverse features like TV wall, and KVM further enhance its cost-effectiveness, offering multiple functionalities within a single solution. In the long run, the reduced maintenance costs, combined with enhanced performance and efficiency, make O1Stream a financially prudent choice for businesses. By focusing on the bigger picture and the cumulative savings over time, the initial transition costs can be seen as a worthy investment in a superior and future-ready technology.

Reliability & Performance Concerns: Uncompressed legacy Cat5 extender has had years to iron out its kinks and establish its reliability. O1Stream would need to prove its reliability and performance in various settings to gain trust.

Ans: Addressing concerns about the reliability and performance of O1Stream requires a combination of transparency about its design process and tangible demonstrations of its capabilities. First and foremost, O1Stream is not a hastily crafted solution but a product of rigorous design and testing phases by a renowned chipset design house. The advanced 22 nm process employed in its SOC design is a testament to its cutting-edge nature. Such a refined manufacturing process ensures higher performance, energy efficiency, and reliability. Moreover, before its introduction to the market, O1Stream undergoes comprehensive simulations to cover all conceivable scenarios, ensuring its robustness in diverse environments. As with any technology, seeing is believing. By providing engineering samples, facilitating pilot projects, and showcasing its seamless operation in varied settings, we aim to build trust within the industry. Over time, as more businesses experience the unparalleled reliability and performance of O1Stream firsthand, any initial reservations will naturally dissipate.



From the vantage point of a dedicated uncompressed legacy Cat5 extender adopter, considering O1Stream as a compelling alternative naturally brings a mix of excitement and uncertainty. The entrenched legacy of uncompressed legacy Cat5 extender is a testament to its enduring value, yet the progressive suite of features in O1Stream beckons with undeniable allure. Encompassing HDMI 2.1 capabilities, true Ethernet connectivity, USB 3.0 over IP, and an ensemble of enhancements like TV wall, KVM, and the 4K120 proprietary video codec, O1Stream is not merely about technological advancement—it's about shaping the future of AV over IP. The allure of seamless compatibility using dedicated converters, the cost-efficiency of leveraging existing cabling, and the promise of avant-garde technological innovation coalesce to position O1Stream as not just another alternative, but as a visionary leap forward in the dynamic world of AV transmission.



EVOLVING BEYOND UNCOMPRESSED LEGACY CAT5 EXTENDER

In the annals of audiovisual technology, uncompressed legacy Cat5 extender emerged a decade ago as a luminary, bringing unprecedented innovations to the forefront. In an era dominated by HDMI, the digital AV distribution sphere faced significant hurdles, chiefly around the limitation of transmission distance. Esteemed pioneers like Crestron, Extron, and SnapOne quickly identified these challenges. Recognizing the potential in

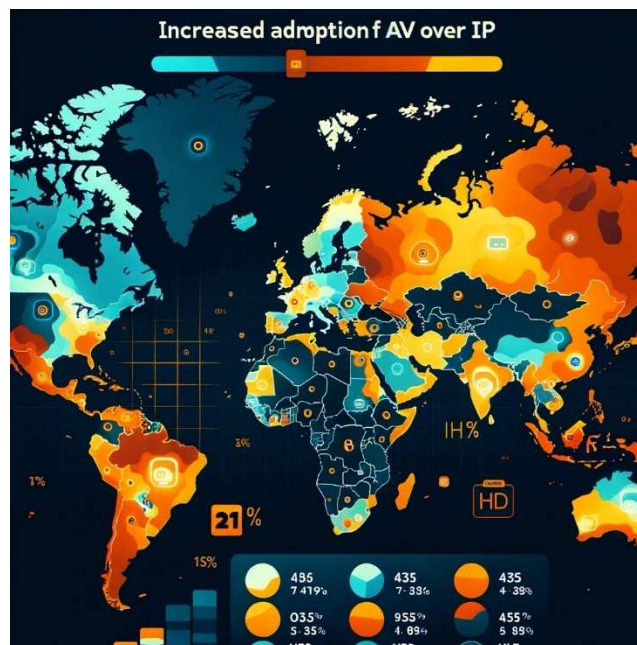


uncompressed legacy Cat5 extender, they swiftly integrated it, establishing its prominent role in the market.

Uncompressed legacy Cat5 extender's standout feature, the "5Play", amalgamated:

- ✧ Uncompressed full HD digital video
- ✧ Audio
- ✧ 100BaseT Ethernet
- ✧ Power over Cat cable (PoC)
- ✧ Control signals including USB 2.0, RS232, and IR

This convergence, transmitted over a single Cat (usually Cat5e/6/7) cable for up to 100 meters, significantly simplified AV installations. It also drastically reduced costs, especially in larger configurations necessitating numerous connections. However, it's crucial to note that uncompressed legacy Cat5 extender struggled with transmitting uncompressed 48Gbps HDMI signals over these typical cables, presenting a challenge to its adaptability.





As technology marched forward, uncompressed legacy Cat5 extender's ecosystem evolved, becoming multifaceted and more versatile. While devices like splitters, matrices, and repeaters enriched its capabilities, providing unparalleled flexibility in transmitting AV and control signals over long distances, they inadvertently introduced design complexities and escalated costs. Additionally, the adoption of uncompressed legacy Cat5 extender necessitated the use of Cat5e/6/6a/7 cabling infrastructure, which, while being the same type used for Ethernet, often requires a separate and dedicated network to optimize performance and reliability for AV and control signals. This separate cabling infrastructure, while ensuring the high-quality transmission of AV signals, further contributes to the overall complexity and cost of implementing an uncompressed legacy Cat5 extender solution.



The global pandemic, an unforeseen disruptor, intensified the shift towards AV over IP. This transformation gave rise to O1Stream. Leveraging economical 1G routers, O1Stream promises a paradigm shift in AV distribution. Its salient features include:

- ✧ **Seamless Integration with Network Structures:** O1Stream's adoption of the advanced proprietary video codec assures enhanced video quality, facilitating optimal real-time streaming and video conferencing experiences. Moreover, the system's integration of USB over IP ensures swift data transfers, accommodating various devices to synchronize effectively.



- ✧ **Exceptional Scalability:** O1Stream elevates scalability in the AV domain by embracing over IP support. Unlike traditional AV setups that often depend on intricate matrices, O1Stream's approach offers enhanced flexibility. This not only enables seamless remote access but also ensures the system's readiness for future advancements and expansions.
- ✧ **Unparalleled Flexibility in Content Delivery:** O1Stream's Software RX integration offers diverse content reception and playback, allowing users to tap into various sources such as live streams, stored media, and cloud repositories.
- ✧ **Robust Security:** Recognizing the importance of security in our digital age, O1Stream offers encrypted transmissions and further fortifies this with AES256 integration.
- ✧ **Advanced Compression Techniques:** O1Stream guarantees premium video quality even under stringent bandwidth conditions, thanks to its cutting-edge compression methods coupled with a high PSNR.
- ✧ **Low Latency for Real-Time Applications:** Recognizing the needs of real-time applications, O1Stream ensures minimal latency, promising users a smooth, interactive experience.
- ✧ **Diverse Codec and Scaler Support:** O1Stream isn't limited to just the proprietary video codec. It supports multiple video codecs, enhancing its adaptability. The inclusion of multiple scalers ensures that video quality is consistently high, irrespective of the source or display resolution.
- ✧ **HDR and UVC to HDMI:** O1Stream supports High Dynamic Range (HDR) for better contrast and more vivid colors. Additionally, it can convert UVC signals to HDMI, broadening its compatibility range.
- ✧ **Transceiver Capabilities:** O1Stream's transceiver functionality ensures that devices can both send and receive signals, enhancing system versatility.

In this evolving narrative, uncompressed legacy Cat5 extender's legacy as an AV trailblazer is indelible. Yet, O1Stream, with its progressive vision, is poised to inscribe the next captivating chapter in the audiovisual narrative.



INTRODUCTION TO HDMI 2.1 TECHNOLOGY

HDMI (High Definition Multimedia Interface) has become the standard for high-definition digital connectors, seamlessly transmitting both audio and video signals over a single cable. Since its inception, HDMI has seen numerous versions, each offering its own set of advancements and benefits. HDMI 2.1, the most recent iteration at the time of writing, brings forth a plethora of new features and improvements over its predecessors, ensuring it remains at the forefront of modern audio-visual technology.

One of the most touted features of HDMI 2.1 is its support for higher video resolutions and faster refresh rates, including 8K60Hz and 4K120Hz. Beyond just better visuals, it also boasts enhanced audio return channel (eARC) capabilities, which deliver sharper and clearer high-definition audio. Furthermore, the inclusion of Variable Refresh Rate (VRR), as discussed earlier, makes HDMI 2.1 particularly appealing for gaming enthusiasts, ensuring smoother gameplay and reduced latency. Dynamic HDR, Auto Low Latency Mode (ALLM), and Quick Frame Transport (QFT) are other salient features that solidify HDMI 2.1's position as a game-changer in the realm of audio-visual transmission.

HDMI 2.1, the latest iteration of the HDMI specification, is not just an upgrade; it's a revolution. As our digital world constantly advances, the need for enhanced audio-visual quality, lower latency, and better overall performance in transmission has grown significantly. HDMI 2.1 has been designed to cater to these emerging demands, bringing a slew of improvements that redefine the AV experience.

Explanation of HDMI 2.1 Technology and its Advantages:

Enhanced Bandwidth: HDMI 2.1 boasts a bandwidth of up to 48 Gbps (Gigabits per second), a significant leap from HDMI 2.0's 18 Gbps. This facilitates the transmission of higher resolution video without compression, ensuring pristine visual quality.

Support for Dynamic HDR: While HDMI 2.0 did support HDR, HDMI 2.1 brings in Dynamic HDR. This means metadata, which dictates how the HDR content should be



displayed, is sent frame-by-frame, ensuring optimal detail and depth for every single frame.

Higher Video Resolutions: HDMI 2.1 supports up to 10K resolution. However, more commonly, it's the support for 8K at 60Hz and 4K at 120Hz that stands out, catering to ultra-high-definition content and displays.

Variable Refresh Rate (VRR) and Auto Low Latency Mode (ALLM): These features cater particularly to gamers. VRR ensures smoother visuals by allowing the screen to refresh in response to the output of the GPU, while ALLM ensures the most responsive mode for gaming is activated, reducing lag.

Enhanced Audio Return Channel (eARC): eARC provides a boost in audio quality, allowing uncompressed and object-based audio, such as DTS:X and Dolby Atmos, to be transmitted.

Quick Frame Transport (QFT): This reduces latency for smoother no-lag gaming and real-time interactive virtual reality.

Comparative Analysis: HDMI 2.1 vs. HDMI 2.0:

	HDMI 2.0	HDMI 2.1
Full HD Blu-ray Disc and HD DVD video	✓	✓
Consumer Electronic Control (CEC)	✓	✓
DVD-Audio	✓	✓
Auto lip-sync	✓	✓
Dolby TrueHD / DTS-HD Audio	✓	✓
Ethernet channel	✓	✓
Audio return channel (ARC)	✓	✓
Enhanced audio return channel (eARC)	✗	✓
Variable refresh rate (VRR)	✗	✓
Quick media switching (QMS)	✗	✓
Quick frame transport (QFT)	✗	✓
Auto low latency mode (ALLM)	✗	✓



Resolution and Frame Rates: While HDMI 2.0 was limited to 4K resolution at 60Hz, HDMI 2.1 pushes this boundary to 8K at 60Hz and even 4K at 120Hz. This ensures smoother visuals, particularly beneficial for high-action content like sports or gaming.

Bandwidth: With more than double the bandwidth of HDMI 2.0, HDMI 2.1 ensures better quality transmissions, accommodating the increasing demands of advanced displays and content.

Gaming and Interactive Media: HDMI 2.1 is a boon for gamers. Features like VRR, ALLM, and QFT weren't available in HDMI 2.0, making HDMI 2.1 a clear choice for next-generation gaming consoles and setups.

Audio: The eARC feature of HDMI 2.1 allows for more advanced audio formats and higher audio quality than HDMI 2.0.

In essence, while HDMI 2.0 was groundbreaking in its time, HDMI 2.1 is a transformative leap, built for the future of entertainment, gaming, and interactive media. Whether you're a content creator, distributor, or consumer, HDMI 2.1 ensures you're equipped with the best in AV transmission technology, guaranteeing optimal experiences across the board.

MARKET ANALYSIS FOR HDMI 2.1

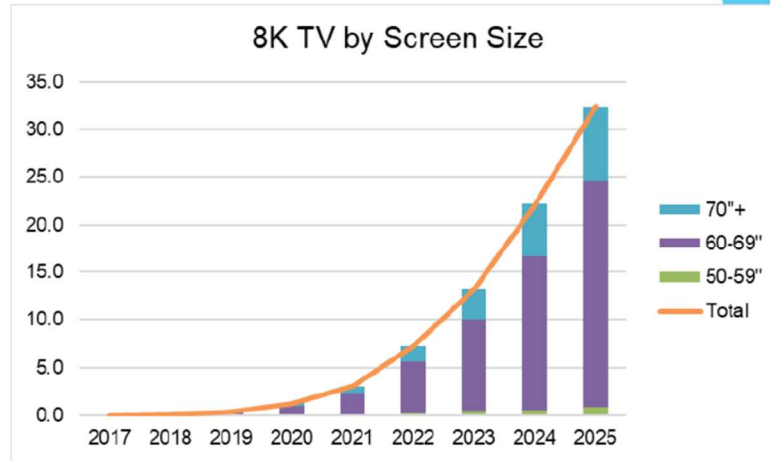
HDMI 2.1 Market Trends:

1. Demand for Higher Resolution Displays: With the advent of 8K televisions and monitors, the demand for HDMI 2.1 has seen a significant rise. Consumers desire the best visual experience, and HDMI 2.1 caters precisely to that, supporting higher

resolutions and faster refresh rates.

TV Market by Resolution

- ▶ 8K will gain increasing share of 60"+ market
 - ▶ 65" and 75" efficient cuts from Gen 10.5 will drive the largest volume
 - ▶ >80" via 2-cut Gen 8 will be the premium 8K offering
- ▶ 2018/2019 BPs
 - ▶ SDC 15 / 200K
 - ▶ LGD 0 / 50
 - ▶ AUO 0 / 70
 - ▶ Sharp 3 / 40
 - ▶ BOE 0 / 40
 - ▶ WW 18 / 400K



2. Gaming Industry's Push: The gaming industry, especially with the release of next-gen gaming consoles, has emphasized the need for HDMI 2.1. Gamers seek reduced latency, smoother visuals, and the best audio-visual experience, all of which HDMI 2.1 readily offers.

Variable Refresh Rate (VRR) is a gaming feature which produces a more fluid and better detailed gameplay experience

Variable Refresh Rate syncs up source and display with continually changing refresh rate, up to a frame-by-frame basis





3. Enhanced Audio Experiences: With the improved eARC capabilities, there's been a growing trend in home theaters and sound systems that support HDMI 2.1, allowing for lossless audio formats and ensuring top-notch sound quality.



eARC supports the most advanced high-bitrate home theater audio formats, object-based audio, uncompressed 5.1 and 7.1, and 32-channel uncompressed audio

Object-based audio provides an immersive multi-dimensional experience and enhanced audio detail and depth

4. Adoption by Tech Giants: Leading manufacturers of TVs, gaming consoles, and PCs have begun integrating HDMI 2.1 ports into their latest models. This wide-scale adoption by industry leaders indicates a promising upward trajectory for HDMI 2.1 in the market.



BROAD SPECTRUM OF 92 GLOBAL MEMBER COMPANIES



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5. Future-proofing: As consumers become more tech-savvy, there's a growing trend to future-proof their electronic purchases. Investing in HDMI 2.1 ensures compatibility and optimum performance with future technological advancements.

Target Market:

The target market for HDMI 2.1-based solutions encompasses a broad spectrum:

Consumer Electronics: This includes homeowners upgrading their home entertainment systems, gaming enthusiasts seeking enhanced performance from next-gen gaming consoles, and audiophiles demanding superior sound quality.

Professional AV Installations: Commercial spaces, conference facilities, educational institutions, and entertainment venues are continually seeking advanced AV solutions to provide better experiences for their stakeholders.

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Gaming and eSports Industry: With HDMI 2.1 offering features like VRR, ALLM, and enhanced resolutions, the gaming industry, which is witnessing exponential growth, is a significant market segment.

Film and Broadcasting: Production houses and broadcasters require the best AV solutions for both creation and transmission of content.

Shift to Higher Resolutions: With the availability of 4K and 8K TVs and monitors, there's a growing demand for devices and transmission solutions that can handle such high resolutions without compromise.

Rising Popularity of Dynamic HDR: As content creators produce more HDR content, there's a trend towards Dynamic HDR to optimize visuals frame-by-frame.

Demand for Low Latency: Real-time experiences, especially in gaming and virtual reality, are pushing the demand for solutions offering lower latency.

Smart Integration: As smart homes and interconnected devices become commonplace, HDMI solutions that can integrate with various smart systems will see rising demand.

Competitive Landscape:

Established HDMI Solutions: Brands that have been offering HDMI solutions, including cables and connectors, would likely upgrade their portfolios to include HDMI 2.1 offerings.



Tech Giants: Companies like Sony, Samsung, and LG, who manufacture TVs and monitors, are significant stakeholders as they would incorporate HDMI 2.1 ports in their new models.

Gaming Console Manufacturers: With the likes of PlayStation and Xbox, HDMI 2.1 compatibility becomes a selling point, making these companies influential players in the market.

Market Demand for HDMI 2.1-based Solutions:

Given the advancements HDMI 2.1 offers over its predecessors, there's a substantial and growing demand for its solutions. Consumers and professionals alike seek enhanced visual and auditory experiences, and with 4K and 8K content becoming more accessible, HDMI 2.1-based solutions are positioned to capture a significant market share. Furthermore, as gaming consoles and PCs offer more graphics-intensive games and applications, the demand for HDMI 2.1's capabilities, especially regarding resolution, refresh rates, and low latency, will see a steep rise.

Potential Market Share Capture:

If current trends hold, HDMI 2.1 solutions could potentially dominate the AV transmission market in the next few years. Given the obsolescence of older HDMI versions and the rising demand for advanced AV experiences, HDMI 2.1's market share could see exponential growth. Manufacturers adopting HDMI 2.1 early could benefit from being market leaders, setting standards, and capturing a significant consumer base.

In conclusion, HDMI 2.1 is poised to be the future of AV transmission, with immense potential in both consumer and professional segments. As technology advances and consumer demands evolve, HDMI 2.1-based solutions are primed to meet and exceed expectations, promising a significant market presence.