

Kaleidescape: A Glimpse at the Future of 4K Home Entertainment

Excerpted from *The Digital Bits* article by Bill Hunt published June 30, 2020.
Find the full article at <https://thedigitalbits.com/featured/articles/the-future-of-4k-entertainment>.

One of the most interesting aspects of having served as the editor of **THE DIGITAL BITS** website for over twenty years now, is that I've had a front row seat to some pretty dramatic changes in the home video industry. At 53, I'm old enough to remember watching movies on black-and-white televisions—square analog displays that required the viewer to adjust a pair of “rabbit ear” antenna to get a decent picture. Like some of you, I saw the advent of cable television and the arrival of VHS and Betamax videotape—a technology the film industry fought tooth-and-nail to kill until its profit potential finally became obvious.

I founded **THE DIGITAL BITS** in late 1997 in part because I knew that DVD would be a hit. Having worked at a record store a decade earlier, when Compact Discs took the music world by storm, it was obvious to me that consumers would embrace the idea of movies on a disc that was—to them—essentially identical to the CDs they already loved. Of course, DVD did turn out to be transformational. High definition movie discs soon followed, after a brief format war, resulting in the adoption of Blu-ray Disc. And now the most discerning home theater enthusiasts have embraced an even higher quality movie experience on 4K Ultra HD Blu-ray.

But there remains a problem with this picture, one that film enthusiasts cannot afford to ignore: While DVD quickly became the most successful home entertainment format of all time, each successive movie disc format has captured a smaller share of the market. Only about 40% of DVD fans eventually embraced Blu-ray. And less than 10% of Blu-ray fans have likewise upgraded to 4K Ultra HD. There are lots of reasons for this—cost, budgets strained by multiple recessions, less inclination by younger consumers towards ownership, the advent of Digital streaming, and sheer market saturation. But whatever the reason, the result is clear: Movie discs are on the decline.

There's now just one major replicator of physical media in all of North America (down from six at the height of DVD). The enthusiast favorite player manufacturer—Oppo Digital—has abandoned the market. So too has Samsung, once a major player in the space. The indie movie distributor Twilight Time is no more... and they certainly



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won't be the last such company to fold in the years ahead. And prior to the recent pandemic (which caused a brief spike in all home entertainment spending, but is now depressing disc spending due to a lack of new titles in stores), physical movie disc sales had dropped by double-digit percentages three years in a row (18% in 2019, 14.6% in 2018, and 14.1% in 2017 per the Digital Entertainment Group)—a precipitous decline.

This is a problem for fans of movies on physical 4K Ultra HD in particular. It means that there are *many* films enthusiasts would love to buy that will never be available on 4K disc. And based upon the trends I've just described, there's no reason to believe the situation is going to improve going forward.

HOUSTON, WE HAVE A PROBLEM

The “Golden Age of Discs,” as many enthusiasts call it, also heralded an era of unprecedented access to a vast and growing array of movie and TV content. Gone are the days of being stuck with only those new and classic Hollywood films that someone else decided were worthy of showing at your local theater or on pay cable—you can now curate your own viewing choices from essentially the entire world's cinema and television programming. But while streaming services like Amazon Prime, Apple TV, Netflix, Disney+, Roku, Vudu, the Criterion Channel, and others do offer access to a tremendous variety of content, there are some key downsides. For casual movie viewers, some of whom are quite happy watching their content on a tablet or smartphone, they're not a significant issue. But for *serious* movie enthusiasts—the kind of people who've invested their hard-earned money in mid-priced but lovingly-calibrated home theater displays and sound systems—they're a deal-breaker.

For one thing, due to the byzantine nature of content distribution rights and dealmaking—and the advent of original programming produced by the streaming services themselves for exhibition to only their own customers—it's become very hard to one-stop shop for content. Some movies are available on multiple services, some are limited to just one, and many (especially older classic and foreign films) simply aren't available at all. In addition, as these deals expire or get renegotiated, titles that were available on one service can suddenly disappear and later show up on another. If there's a film you'd really love to watch on the spur of the moment—particularly one that isn't a Hollywood blockbuster—you don't want to have to search multiple streaming catalogs just to find it.

And while a few of these services do offer streamed movie content in 4K resolution, the higher compression and variable bit rates required to make streaming delivery work over Internet connections of varying speeds means that there's just no comparison—in terms of sheer image and sound quality, the physical 4K Ultra HD disc experience has always been superior. But if Digital is the future, all of this represents a real concern for 4K enthusiasts. How do we maintain the level of quality we've come to expect on disc in a world where the disc itself eventually goes away?

Well... it turns out there *is* a product that could show the way.

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ENTER KALEIDESCAPE



For the last couple of months, I've had the opportunity to demo a Kaleidescape Strato movie player. And it's been an eye-opening experience.

Serious A/V enthusiasts, and those familiar with the high-end home theater installation world, will likely already know of Kaleidescape. But for most of you—those that are *film* enthusiasts first and foremost—this may be your first exposure to them. Essentially, Kaleidescape is a company dedicated to delivering a luxury home theater experience. Their goal is to provide the absolute best quality movie viewing option that's possible in the home. And since the company's founding in 2001, they've focused on developing the trust within the film industry—and the custom and robust technical engineering on the hardware side—required to achieve that goal.

Kaleidescape starts by obtaining the very best source material possible: the Hollywood studio “mezzanine” files for each film. Using a proprietary process they've developed in-house, they create a master-quality digital version of that film that's designed—bit for bit—to preserve the maximum picture and sound fidelity. That film then becomes available on Kaleidescape's online movie store, where customers can purchase access to it in perpetuity (for prices that are roughly comparable to the corresponding disc version). But once purchased, rather than streaming that film in a highly compressed format, the movie file is downloaded in its entirety to Kaleidescape's Strato movie player (or Terra movie server).

The Strato is a disc-less movie player, a sleek-looking silver and black hard drive that fits neatly into your home theater. It currently comes in two sizes, one with a 6 terabyte (TB) hard drive and one with 12 TB. To give you an idea of what that means, the 12 TB player can typically store between 180 and 360 movies depending on your particular mix of HD and 4K. If you decide you want more storage locally, you can add a Terra movie server to your system (in 24 TB or 40 TB versions). But you needn't worry about storing all of the films you've purchased from Kaleidescape locally—they exist in the

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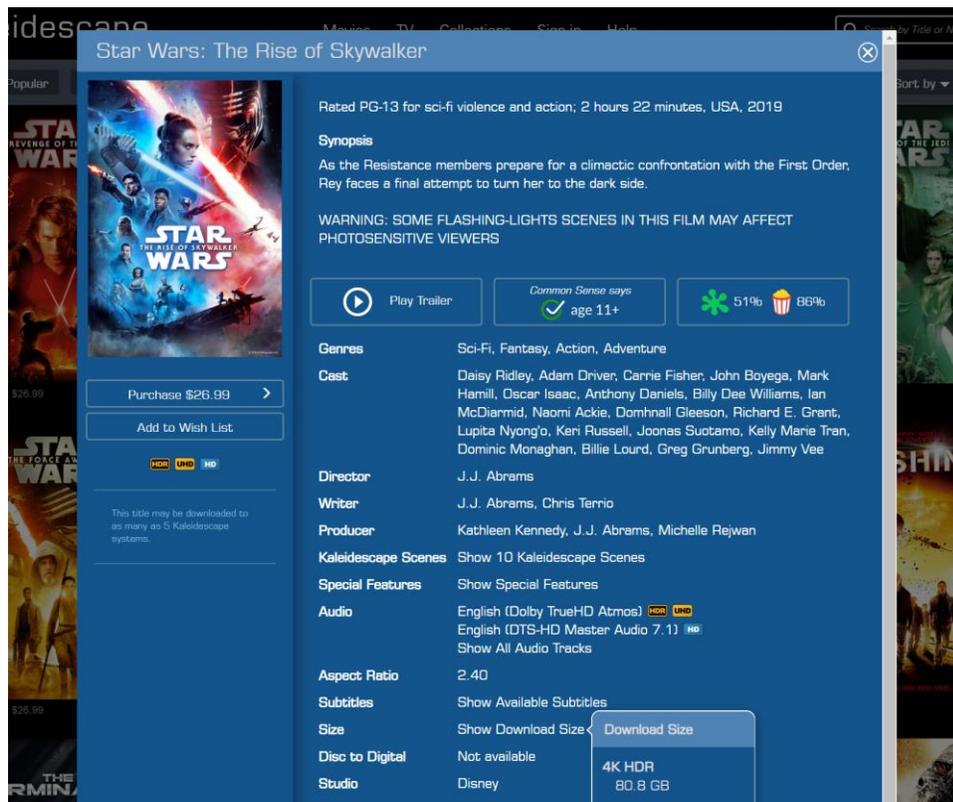
company's online cloud as well. Every movie purchase you make is always available in your account, accessible for download at any time.

Remember, this isn't a streaming experience. You download the movie directly to your unit. So when you play it back, you're doing so at the full bit rate—up to 100 Mbps (compared to 20-25 Mbps for Netflix 4K, for example). Compared to streaming, Kaleidescape delivers 3-12 times more video data and 10-50 times more audio data to your movie player's processors. An SD movie from Kaleidescape represents bit-for-bit DVD quality. An HD movie is bit-for-bit Blu-ray quality. But here's the kicker: A 4K movie from Kaleidescape is at least bit-for-bit 4K Ultra HD Blu-ray quality and often better. Keep in mind, while physical 4K discs are limited to 50 GB, 66 GB, and 100 GB configurations, Kaleidescape has no such restrictions. So when they're able to do so, the company maxes out their movie file sizes.



Let me give you some real-world examples: Disney's physical *Star Wars: The Rise of Skywalker* 4K release comes on a 66 GB disc. The Kaleidescape 4K download is 80.8 GB. Disney's *Avengers: Infinity War* 4K comes on a 66 GB disc. The Kaleidescape 4K download is 86.3 GB. And Disney's *Avengers: Endgame* 4K comes on a 66 GB disc. The Kaleidescape 4K download is a whopping 103.3 GB!

I evaluate video quality for a living—and have been looking at video professionally for over thirty years now. Trust me when I say, this is the first time I have ever experienced anything better than a 4K disc in my home theater.



The difference is readily apparent to anyone attuned to high-end video quality. The added video data improves the color and dimensionality of the image considerably. And the added audio data improves the robustness and spaciousness of the soundstage. I evaluate video quality for a living—and have been looking at video professionally for over thirty years now. Trust me when I say, this is the first time I have ever experienced anything better than a 4K disc in my home theater.

The sheer volume of 4K content available from Kaleidescape is impressive—many more movies are available there in 4K than you can currently buy on physical Ultra HD Blu-ray discs (at least 350 more titles and counting, in fact, at the time of this writing). And in truth, direct playback access to the digital movie file (as compared to streaming or even a laser reading a disc) has advantages of its own. There are no glitches, no Internet bandwidth hiccups, no laser jitter, no disc/firmware incompatibilities, and no read errors caused by scratches or fingerprints. The movie just plays perfectly every time. Better still, you never have to deal with disc exchange programs again (caused by mistakes in the authoring process that studio QC didn't catch—a problem that's gotten more common in recent years as the studios have tightened their budgets.)

The movie download times are also surprisingly speedy, provided you have a good Internet connection. My typical experience is that a full 4K film takes less than an hour to download. And Kaleidescape currently has content deals with 45 studios, including all of the majors. So they have a vast and growing library of available movie and TV content. (In fact, the complete Studio Ghibli animation library was added to their online store in HD quality during my demo period with the Strato.)

But for the rest of you, imagine a future where Kaleidescape releases an entry-level movie player priced comparably to Oppo's no longer available (but enthusiast favorite) UDP-205 audiophile 4K disc player, or Panasonic's current reference class DP-UB9000 player, or Sony's premium UBP-X11000ES player. Imagine too, that the company continues to expand its online content library while adding additional features of greater appeal to mainstream film enthusiasts (as opposed to just high-end A/V enthusiasts). Were those things to happen, Kaleidescape would suddenly become a serious and attractive option for many 4K and Blu-ray movie disc fans—people like you and me—who are incredibly passionate about film, who have lovingly assembled great but affordable home theater systems, and who demand as much value as quality for every dollar they spend. It would prove that the disc-less future doesn't have to mean low-quality streaming—a future I find far more appealing.

To be sure, there will always be those who are quite happy to enjoy their HD and 4K content via streaming on a Roku, Apple TV, Amazon Fire Stick, or mobile device app, just as there were consumers who preferred renting movies on VHS or DVD rather than buying them. But again, as someone who cares passionately about the ability to watch movies at home in the highest possible quality, I'm very intrigued by any product that's going to give me a "disc or better" 4K viewing experience, without all the compromises of streaming, at a price point that's similar to discs, and with a larger 4K library than is likely ever to be available on disc.

And keep in mind, I say this as someone who has championed movie discs for more than twenty years now. *No one has fought harder than I have* for the ability of fans to enjoy their favorite films on disc at home in the best possible quality. But while I hate the idea that discs are eventually going to go away... they are. I named this website **THE DIGITAL BITS** for a reason: Hollywood has firmly set its sights on a Digital future. This is true for cost reasons, for efficiency reasons, for control reasons, even for environmental reasons. Discs might stick around for 10 more years, maybe even 20 at the outside. But what you will start to see *much* sooner—if current downward sales trends continue—is fewer titles released on disc and more indie distributors throwing in the towel. And one day, the major studios will stop producing discs altogether. *4K Ultra HD Blu-ray is very likely to be the last physical home entertainment format.*

Given all of this, if you were to ask me what a best possible disc-less future looks like for watching movies at home... well, it looks an awful lot like Kaleidescape. So you can bet we'll be watching the company closely here at **THE BITS**, and that we'll have more to say about them in the months and years ahead. In the meantime, you can visit their website at www.kaleidescape.com to learn more.

That's all for now. As always, stay tuned...

– **Bill Hunt**

(Follow Bill on social media at these links: On Twitter @ <https://twitter.com/BillHuntBits> and on Facebook @ <https://www.facebook.com/billhuntbits>)

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