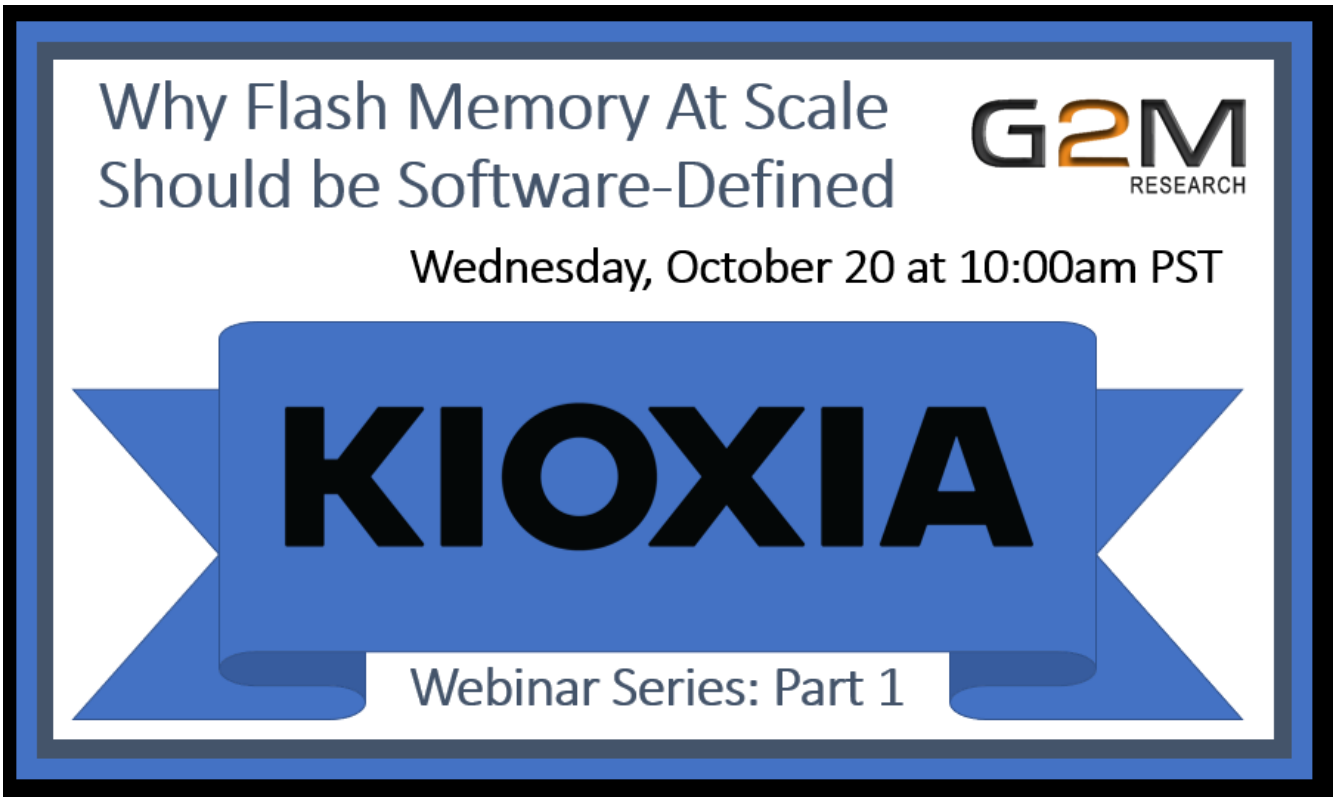
Highlights

The last of the Daniel Craig James Bond series is out …No Time to Die. The 007 movies include 27 blockbusters with Bond also played by Roger Moore, Pierce Brosnan, and Sean Connery. Our October newsletter includes a James Bond inspired datacenter buried 100 feet below solid granite. We also look at the evolution of datacenters in movies (from prop to an integral part of the plot).

"Q: Age is no guarantee of efficiency. James Bond: And youth is no guarantee of innovation." Skyfall.

Join us for our KIOXIA webinar series, starting October 20. The rest of our 2021 webinars and our G2M Multi-Vendor Webinar Series 2022 schedule is available at the end of our newsletter and on our www.g2minc.com website. We have some exciting topics coming up. We also provide a list, with links, of upcoming conferences, although most continue to be virtual.

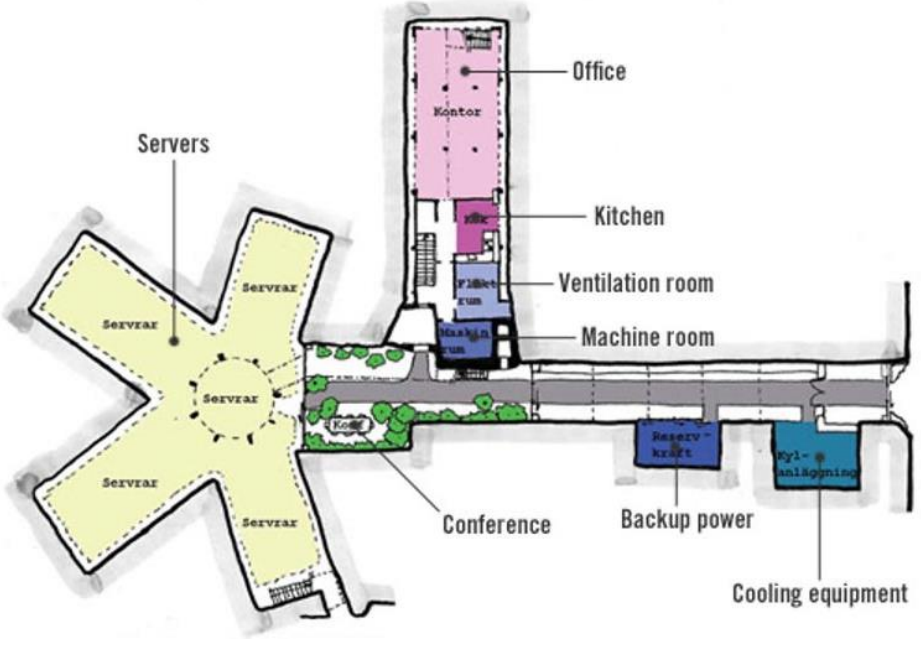
Cheers! Mike Heumann



James Bond Inspired Datacenter

Why watch the movies when you can actually visit the lair..

Jon Karlung, CEO at Bahnhof, took inspiration from James Bond movies, Star Wars: The Empire Strikes back, Logan's Run, and Silent Running in converting a nuclear bunker in Stockholm, Sweden into the world's most physically secure datacenter. The front entrance can be reached only by tunnel, the doors are nearly 16 inches of steel, located below 100 feet of solid granite, and designed to withstand a hydrogen bomb. They kept its code name, Pionen White Mountains.



The facility has simulated daylight, walls covered with plants, conservatories, man-made waterfalls, and massive saltwater fish tank. There is space for 6k servers and heat generated by servers is recycled to heat the facility and area housing. Two German submarine engines serve as backup power.

Cooling- Baltimore Aircoil fans produce a cooling effect of 1.5 megawatts, enough for several hundred rack-mounted units. Cooling, cabling, and electrical wiring are under a 3.3 foot deep raised floor. The network has full redundancy with both fiber optics and extra copper lines. The center has an IT usable capacity of 800 kW. There are 140 cabinets with power density of 5.7 kW average per cabinet. The facility serves as a co-location hosting center. The facility previously hosted a couple of WikiLeak servers, a source of controversy for others but not for Bahnhof, unwilling to bow to political pressure. A tour of the facility, hosted by CEO Jon Karlung, is available here.

"It is possible to gather big data and analyze it, and receive amazing things and knowledge from it. However, these days it's possible to use this to shackle people. I guess you can say that there are so many things that happen in our lives online. And if you're in this—let's call it a closed 'universe'—there are a few, big, dominating players who plan out the rules in that universe. I think that this ultimately is a philosophical matter. Like, what is it to be a human being?"

Jon Karlung, CEO, Bahnhof

"*James Bond movies have also had an impact on the design. I was actually looking for the same outfit as the villain 'Blofeld' in Bond and even considered getting a white cat, but that might have been going a bit far!"* Jon Karlung, CEO, Bahnhof

Software-Enabled Flash Technology

KIOXIA

KIOXIA showcased its Software-Enabled Flash™ technology at this year's virtual SNIA Storage Developer Conference (SDC). Video demonstrating KIOXIA's Software-Enabled Flash SDK supporting multiple flash drive protocols, including Zoned Namespace, standard block, and customized flash translation layer modes, can be accessed by clicking here: https://www.youtube.com/watch?v=hYyhOOUbFlY. Today's data centers are almost fully software-defined, from the software-defined network to virtualized and containerized computation to the software-defined file system. Enabling flash storage to be software-defined allows flash to be tailored to the specific needs of any application.

"We developed Software-Enabled Flash technology to deliver the full value of flash memory and solve the unique problems of hyperscale cloud providers and storage developers. The Software-Enabled Flash SDK builds on the existing API and provides an even easier, more compelling way to use flash. Software-Enabled Flash technology is a force multiplier in data center economics, and we know it takes a community of developers and vendors to make a revolutionary project like this work. We look forward to engaging in discussions at SDC and bringing together flash vendors, controller manufacturers and end users to make this open standard successful."

Eric Ries, SVP
Memory Storage Strategy Division
KIOXIA America, Inc.

By removing the impediment of legacy protocols, Software-Enabled Flash technology delivers software-defined flash to hyperscale users and fundamentally redefines the relationship between the host and flash devices, allowing cloud-scale users to unlock the most value from their flash. Developers are freed from narrowly defined “drive” behavior, which presents challenges for applications requiring control over workload isolation, data placement, and quality of service. Learn more at KIOXIA.

Axe Horror Stories in The Shining and in Datacenter

“I was working at a Tier 1 data center in downtown Cincinnati that was under construction. A worker wielding an axe accidently chopped right into one of the risers that carries the cooling solution up and down the building. Not knowing what to do when things were heating up in the middle of the night, they had to kill the power completely. It took weeks to recover from that mistake.”

User: ecklerwr1, Network/Systems Engineer

SolarWinds THWACK community

But, if that is not enough of a nightmare for you, picture this. Management decides to relocate datacenter including 30 servers, to another site, 20 miles away. Management assigns task to IT guy to get everything moved as quickly and efficiently as possible and to do everything possible to minimize down time. IT guy hires movers for 4pm pickup, delivery, setup, and get the servers back up by 9pm. The movers disconnect everything, load up, drive off, but don’t show up at the new location.

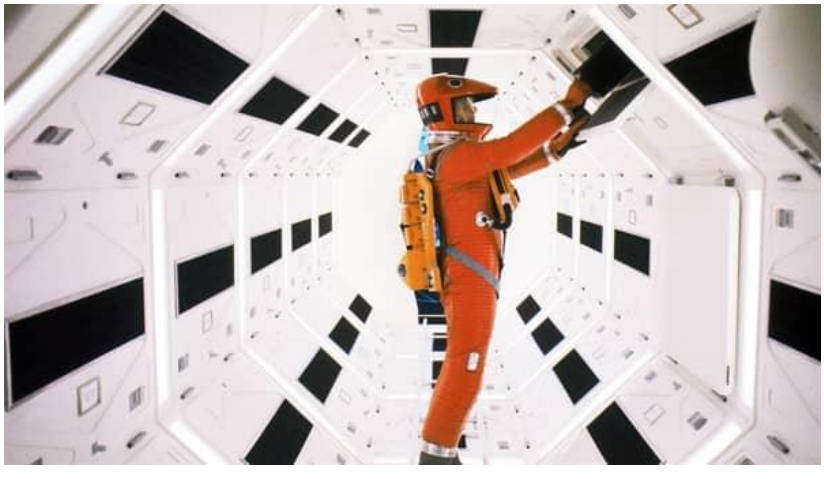
The movers decided they were done working for the day, parked the van with the datacenter in the company parking lot, and went home for the night. The IT guy couldn’t find them and had to tell his boss that the datacenter was “missing.” Fortunately, the delivery was made the next day. (And that moving crew was fired.)

See Jack Nicholson prep for this famous axe scene in The Shining.

And, did you know that Ebay retired its oldest server by giving it the axe.

Datacenters in Movies

Technology, including special effects in movies, as truly evolved. How have datacenters evolved in movies – not just as a background prop but as a central feature? We highlight a few movies below…



2001: A Space Odyssey, 1968

Keir Dullea, Gary Lockwood, William Sylvester – A quest to find mankind's origins with help from supercomputer H.A.L 9000

The main character must disassemble the AI villain inside the datacenter. And, while datacenters did not make it to space by 2001, that technology is well underway for the near future. The movie is iconic in reflecting much of the technology we take for granted today.

WarGames, 1987

Matthew Broderick, Ally Sheedy, John Wood – A young man finds a backdoor to a military central computer and game play is blurred with reality and the potential threat of WWIII.

Okay, fair enough, no datacenter. But, it gets an honorable mention at that start of this evolution because President Reagan asked how plausible the plot was and signed the first computer security directive by a president, "National Policy on Telecommunications and Automated Information Systems Security" in response.

Hackers, 1995

Jonny Lee Miller, Angelina Jolie, Jesse Bradford – Hackers are blamed for a virus that will capsize five oil tankers

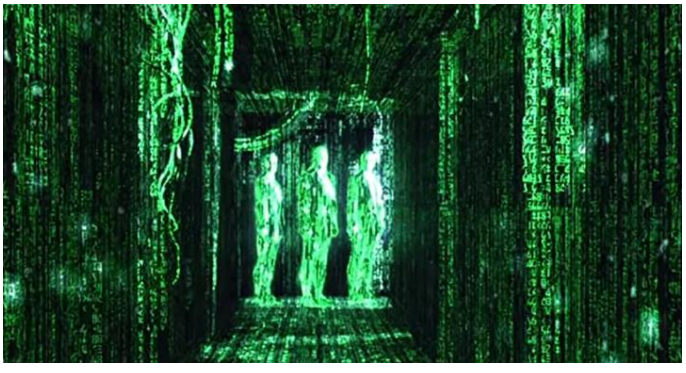
This movie influenced and perpetuated the myth that hackers are so smart that it is pointless to fight them. The datacenter servers were blue boxes lit up with lasers. As all technology insiders know, datacenters are not (currently) designed for aesthetic appeal.

Entrapment, 1999

Sean Connery, Catherine Zeta-Jones, Ving Rhames – An insurance agent tracks down an art thief

They sneak into a server room, break open a cabinet and steal millions from a stock exchange by connecting a few patch cables. The scene is often cited as one of the worst "hacking" scenes in movies. The alarm is set once the cable touches the laptop and not the server.

The Matrix, 1999



Keanu Reeves, Laurence Fishburne, Carrie-Anne Moss – Inside a simulated reality, the Matrix, machines use people as an energy source. Reeves leads a rebellion against the machines.

Humans are the perfect battery for this datacenter. And fortunately, the energy required to keep these people living and incubated is lower than the energy generated to power the datacenter. Released the same year as Entrapment? From raising questions about the role of AI and the direction of technology, the Matrix definitely brings the cool factor to the techie.

Ocean's Eleven, 2001

George Clooney, Brad Pitt, Julia Roberts – Danny Ocean and his 10 accomplices plan to rob three Vegas casinos simultaneously

With directions to the server room written on his hand, techie Eddie then deftly finds the cable he needs among numerous identical server cabinets. He clips a device to the cable and the casino security camera system is now available via remote laptop. The hack may be far from realistic, but the classical datacenter with traditional racks is spot on.

Live Free or Die Hard, 2007

Bruce Willis, Justin Long, Timothy Olyphant – The Russians are hacking into critical US infrastructure and must be stopped.

Russian hackers access numerous critical systems from a single dashboard. A few taps of the keyboard results in aggressive breaches. If viewers can suspend reality enough to appreciate that McClane can hang off the tail of an F-15 fighter jet while the pilot ejects, the security gaffs are easy to buy. As one reviewer acknowledged, "It's hard to imagine

him owning a PC, let alone cruising the Internet in search of blog tidbits or pornish delights. But if he did, we can only imagine him picking up a computer and hurling it to the floor when for some reason he had trouble paying bills online or balancing his checkbook. In other words, his short-tempered everyman has been dragged snarling and fretful into the computer age, and there's some fun to be had from him." A blistering review of technical aspects of the movies includes, "Hackers are wizards with unlimited power who can do anything the plot is calling for at the moment: reroute the gas mains, shut down the electrical grid, change stock prices, take over your GPS system, hack into your hamster and turn it into a time bomb (ok, I made this last one up) – you name it. They can shut down the country and bring about the end of civilization and the only person who can stop them is a grizzled, cynical cop who doesn't know much about computers but can kick serious ass." Fair. I think most people watch these movies for exactly that.. but, I digress.

Avatar, 2009

Sam Worthington, Zoe Saldana, Sigourney Weaver – A paraplegic Marine dispatched to the moon Pandora is torn between following orders and protecting the world.

The movie generated more data than any other movie in history and the complexity of the data center, technology, and effects is well worth the read – we include a separate article below

Iron Man 2, 2010

Robert Downey, Jr., Mickey Rourke, Gwyneth Paltrow – superhero Iron Man

This marketing datacenter movie includes a cameo appearance by Oracle CTO Larry Ellison and Oracle Exadata servers. Definitely

datacenter realism. Definitely a great public relations, marketing expense. BTW, we make short videos that are much more affordable than movies if you would like to promote your company name. We could even throw in a superhero.

Tron: Legacy, 2010

Jeff Bridges, Garrett Hedlund, Olivia Wilde – The son of a virtual world designer looks for his father and gets lost in the digital world

The data center has no hot aisles, and the protagonist plugs directly into a server. The servers are spaced apart making it difficult to envision connecting them. As one review explains, "Most data centers have hot and cold aisles which help regulate temperature and keep things from overheating. In *Tron: Legacy*, protagonist Sam Flynn breaks in to the ENCOM data center so that he can upload a program to their servers. The room has a visually impressive style, with each cabinet standing on its own and all of the cabinets facing the same direction. While it's certainly interesting to look at, a set up like that would really mess with airflow and temperature."

Skyfall, 2012

Daniel Craig, Javier Bardem, Naomie Harris – Bond investigates an attack on M16

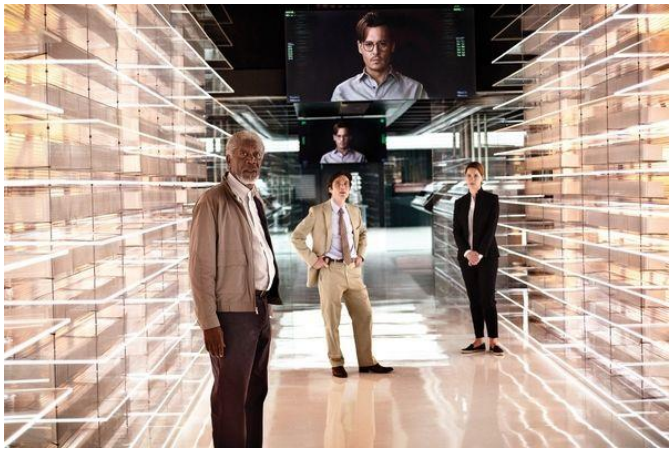
Chris Crosby, CEO, Compass Datacenters, Skyfall was the "data center movie of the year."

Paranoia, 2013

Liam Hemsworth, Gary Oldman, Harrison Ford – An employee must spy on a corporate rival to obtain trade secrets

The employee sneaks into a datacenter to steal trade secrets. He lifts a fingerprint image from an iPad that was scanned from a spoon, flashes images from his phone to get access to a secret room, and shuts down power in the building by pressing a button on his watch. But, the datacenter and servers look realistic!

Transcendence, 2014



Johnny Depp, Rebecca Hall, Morgan Freeman – A scientist's drive for AI takes on dangerous implications when his own consciousness is uploaded into a program

Transcendence features a $38M datacenter powered by solar panels and built five stories underground, for security and to control

temperatures. The movie highlights green technologies and is similar in construction to the NSA data center and SubTropolis Technology Park's LightEdge data center.

Space Jam: A New Legacy, 2021

LeBron James, Don Cheadle, Cedric Joe – Famous basketball player's son is kidnapped by rouge AI

The entire movie plot takes place in a datacenter, Serververse.

No longer a backdrop, datacenters play leading role in many movies today.

Avatar Movie Generated More Data Than Any Movie in History

The filming of Avatar generated more data than any other movie in history - more than the entire "Lord of the Rings" trilogy combined. The data center at Weta Digital is responsible for the digital 3D effects.

NetApp storage systems reduced Weta's data management overhead by 95 percent and increased storage price-to-performance ratio by 40 percent. To handle the massive storage requirements and provide fast access to that data, Weta worked with NetApp and Fujitsu New Zealand to develop a scalable storage solution. NetApp SA600 FlexCache cluster units were selected to maintain high-speed access to texture files being demanded by the 35,000 rendering cores of the renderwall. The FlexCache units were paired with FAS6000 series storage systems and then linked to the renderwall via two 10 Gigabit Ethernet connections.

HPE - 4,000 HP BL2x220c blades providing compute power. "Through water-cooled radiators, closed rack space, and passive rooftop heat exchangers, the data center stayed cool while running full time and often at full capacity, with no air conditioning," HP reported.

BluArc, a provider of high-performance unified network storage, use of a clustered system of 12 Titan servers to store and manage over 500 terabytes of data feeding thousands of render nodes. "The project grew so big that we ended up doubling our BlueArc storage infrastructure in the last six months of production, and the integration and scalability of the new clusters were quick and painless," explained Paul Ryan, Chief Technology Officer at Weta Digital (now with Meera Consulting).

Computational Storage vs Virtualized Computation/Storage In The Datacenter with Sponsors Achronix, Pliops, and ScaleFlux

How does your organization view the positioning of computational storage in the datacenter versus conventional storage/computation virtualization architectures? (check one):

Computational storage is critical – uniquely solves a number of very important application problems:	24%
Computational storage is a relevant approach to solve some important applications problems:	35%
There may be a few “niche” applications that computational storage has significant value for, but it is not a “wide” application accelerator:	24%
Computational storage may not be viable for applications, but can provide “background” functions (indexing, encryption, compression, etc.):	0%
Computational storage doesn’t have meaningful place in the datacenter:	0%
Don’t know/no opinion:	18%

What experience does your organization have with computational storage? (check all that apply):

Explored information on its use (conferences, articles, etc.):	31%
Talked to computational storage vendors:	25%
Defined potential computational storage projects:	13%
Started one or more proof-of-concept evaluations:	19%
Budgeted for production computational storage deployments:	6%
Deployed computational storage in production:	6%
No experience/don’t know:	38%

G2M Research Multi-Vendor Webinar Series

Our Oct 12 webinar “Cloud Service Providers: Is Public Cloud, Private Datacenter, or a Hybrid Model Right for You?” with sponsors Lightbits Labs and Netlist is available to view. A copy of the slidedeck is available here. Our webinar schedule is below, including our schedule for 2022. Click on any of the topics to get more information about that specific webinar. You can view all our webinars and access all the slide deck presentations. Interested in sponsoring a webinar? Contact **G2M** for a prospectus.

We also help companies build custom webinars and webinar series as another highly effective approach to reach your target audience – before the webinar(s) with direct and social media marketing, during the webinar with a customized presentation and audience polls, and after the webinar with use of the recording and presentation materials for outreach. Join us for our KIOXIA series, starting October 20.

Oct 20:	Why Flash Memory at Scale Should be Software-Defined
Nov 9:	The Explosion in Imagery from Radiometry, Cryo-EM, and Other Imaging Technologies: Can Storage Keep Pace?
Dec 14:	2021 Enterprise Storage Wrap-up Panel Discussion
Feb 1:	Storage Architectures for High-Performance Computing
Feb 15:	Cybersecurity: Zero Trust or Trust Your People
March 8:	Storage Architectures for AI & ML
March 29:	Storage Technologies for Datacenters in Space
April 26:	Effective Architectures for Edge Computing & Storage
May 24:	Data, Networking, & Storage Acceleration
June 21:	Scaling Storage Capacity & Bandwidth Effectively
July 19:	Hot Semiconductor Startups: Changing the Rules
Aug 23:	Advanced NVMe SSDs
Sept 13:	Public/Private Storage Architectures for CSPs
Oct 11:	Storage Fabrics for Mega-Datacenters
Nov 8:	Securing Cloud Datacenters Resources
Dec 13:	What was Hot (or Not) in 2022, and Predictions for 2023

Upcoming Conferences

October 19-20	IAPP Privacy. Security. Risk. 2021
October 20-21	Counter-Insider Threat Symposium
October 20-21	DevSecCon London
October 20-22	Counter Insider Threat Symposium, Maryland
October 25-27	InfoSec World 2021
October 26-28	MWC Los Angeles
November 2-4	Microsoft Ignite, Virtual
November 8-11	Black Hat Europe, London
November 9-10	OCP Global Summit, San Jose
November 15-18	SC21, St Louis
November 29- Dec 3	Amazon re:Invent, Vegas
January 5-8	CES 2022, Vegas
January 26-28	SNIA 2021 Annual Members Symposium, Virtual
February 7-10	RSA Conference, San Francisco & Virtual
February 8-11	ITExpo, Fort Lauderdale
February 28- March 3	MWC Barcelona
March 2-3	Cloud Expo Europe, London
March 14-17	Gartner Data & Analytics Summit, Orlando
April 23-27	NAB, Vegas

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