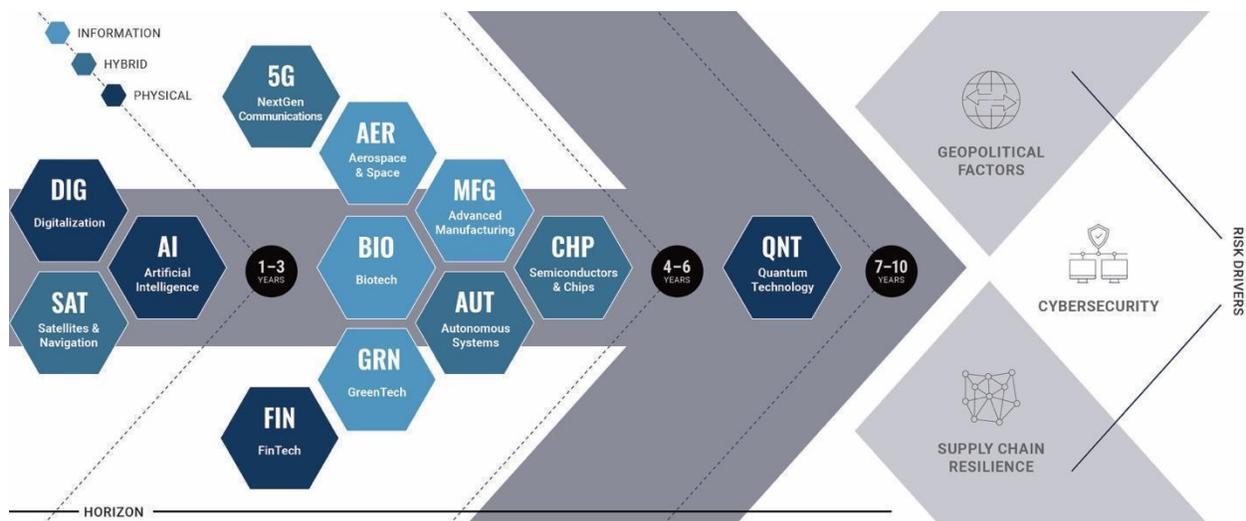




MATRIX MONITOR

Friday October 22, 2021

Welcome to Next5's weekly digest – emerging technology news and analysis to keep you on your game and ready for what's Next



This week's Next5 Matrix Monitor features the latest on competition between China's tech firms, satellites as tools to fight climate change, proposals for AI education and workforce policy, China's testing of hypersonic missiles, U.S. developments in hypersonic technology, the challenges that poorer nations face in addressing climate change, fish-inspired autonomous underwater robots for the U.S. military, China's advances in semiconductor self-sufficiency, and the supply chain's vulnerabilities to cybersecurity threats.

NEXT5 NEWS & AMPLIFICATIONS:

→ CISA issued an [RFI](#) this week seeking technical feedback to identify EDR tools and capabilities for the US Government. CISA has defined a common set of EDR [requirements](#) to ensure that agencies gain the necessary visibility and response functionality needed to effectively detect and respond to cyber intrusions. OMB has released a [memorandum](#) that provides implementation guidance to agencies as they accelerate the adoption of EDR tools and solutions, and work to improve visibility into and detection of cybersecurity vulnerabilities and threats to the government, as defined in [EO 14028](#).

All RFI responses are due by 2PM ET on November 8, 2021.

→ One of our favorite blogs to subscribe to is [The Kitchen Sync](#). Last week the author, Klon Kitchen, highlighted the economic advantage the US holds by empowering Big Tech and cautioned against overly aggressive antitrust crackdowns. Referring to a recent bill that would block any firm valued over \$100B from making any merger or acquisition, he said “This approach breaks with American precedent, bucks antitrust laws, and endangers American security.” Next5 agrees with him. In fact, we wrote our own blog post a few weeks ago that explains how going after Big Tech can actually hurt smaller US tech companies who require more capital than they can raise on their own to make further technological progress. We have already seen a major dip in the Big 5’s investment in smaller businesses out of worry they could be accused of anticompetitive practices and forced to deal with follow on legal proceedings, fines, or ultimately undo the deal altogether. Check out our blogs to learn more.

Read the Kitchen Sync post [here](#).

Read the Next5 post [here](#).

→ In the absence of a definition from any US Government strategy that seeks to address it, Next5 proposes Great Power Competition is defined as:

The set of interlocking economic, military, industrial, and political levers nation states manipulate to achieve global dominance.

We will publish a blog early next week breaking it all down. Follow us to read & comment!

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DIGITALIZATION

→ **Alibaba, challenged by Beijing's yearlong clampdown on private enterprise, is facing a problem of growing competition.** For more than 15 years, Alibaba was China's unassailable e-commerce champion, but as China's e-commerce industry has matured, consumers have started to embrace new ways of shopping that favor browsing and interaction over targeted product searches. That trend has left Alibaba playing catch-up in some areas, and competitors have used the shift to gain a foothold in the world's largest online retail market. Alibaba remains the leading platform in online shopping, but its share of China's retail e-commerce market has fallen to a projected 51% in 2021 from 78% in 2015, according to research firm eMarketer. Making advances against Alibaba have been rival Tencent, which is incorporating online stores into its ubiquitous WeChat social-messaging app; Pinduoduo, a six-year-old e-commerce app that has injected game-like elements into shopping and drawn in bargain hunters with lower-priced goods; and Douyin, TikTok's sister app in China, which is selling products through short videos and live-streaming with the help of its algorithms. #DIG #CHN [WSJ](#)

→ **According to tech visionaries, we'll soon have a metaverse where we'll come together to work, shop, attend classes, pursue hobbies, and enjoy social gatherings, among other things.** San Francisco-based [Unity Software](#) is building tools and services to enable people to create metaverse content. Other big tech companies are developing hardware and software products for the metaverse, or their own virtual worlds within it, including [Nvidia](#), [Roblox](#), [Epic Games](#), Microsoft, and Facebook. The metaverse will require upgrades to existing computer systems and technology, including more raw computing power and higher-quality graphics. Another requirement will be a universal framework that allows users to move seamlessly from one part of the metaverse to another. Moreover, programming tools will have to be simple enough to allow anyone to create their own virtual realms and experiences, not just skilled developers. #DIG [WSJ](#)

→ **Legislation to curb the influence of big technology companies is starting to gain traction in Congress as lawmakers narrow their targets and seek to build on public attention.** A bipartisan group of senators came out last week in favor of legislation that would prohibit dominant platforms from favoring their own products or services, boosting similar efforts already under way in the House. Underlying much of the recent action were disclosures in The Wall Street Journal's Facebook Files series, including one that Facebook's internal research showed that its Instagram app makes body-image worries worse for a substantial minority of teen girls. The disclosures prompted two Senate hearings and renewed calls for legislative remedies. One of the measures with the best chance of passage is an update to the 1998 Children's Online Privacy Protection Act, which has bipartisan support among lawmakers and is also backed by children's advocacy groups. #DIG #USA [WSJ](#)

SATELLITES & NAVIGATION

→ **Satellites are emerging as a tool to fight climate change, exposing hidden sources of greenhouse gas emissions and allowing governments to monitor compliance with international pacts.** Over the past three years, satellite images have been used to spotlight previously unreported leaks of methane, in some cases triggering international scuffles. The disclosures have come from private companies, environmental watchdogs, and others, some working with data from multipurpose, space-agency-owned satellites. Governments, private companies, and environmental groups are also launching dozens of specialized satellites focused solely on scouring the planet for greenhouse gases. Several countries have expressed discomfort with satellite imagery potentially becoming fodder for a rival to “name and shame” them for emissions. China, in particular, has made clear it wants to control monitoring within its own borders and considers such satellites a national security issue. At the International Climate Summit in Glasgow next month, the U.S. and others—including the United Nations, private companies, and the European Space Agency—will be among those advocating wider use of satellites for measuring progress toward cutting greenhouse gas emissions.



A digital rendering of MethaneSAT, an \$88 million satellite project that the U.S.-based Environmental Defense Fund is building with support from the government of New Zealand and others.

PHOTO: BALL AEROSPACE/METHANESAT

#SAT #GRN #USA #CHN #GBR #NZL [WSJ](#)

→ **TrustPoint, a startup developing a global navigation satellite system (GNSS), has raised \$2M in seed funding from venture capital firm DCVC.** With the funding, announced October 18, TrustPoint plans to expand its engineering team, continue developing core technologies including satellite payload testing, and extend key partnerships. Heavy global reliance on GPS for everything from communications and transaction timing to maritime and

aircraft navigation is prompting companies and government agencies to look for backups and alternatives. According to TrustPoint founders Patrick Shannon and Chris DeMay, GPS alternatives are necessary because the current system is inaccurate, slow, unencrypted, and susceptible to jamming and spoofing. TrustPoint's GNSS alternative is intended to provide government and commercial customers with improved service, security, and reliability. Promised improvements include better accuracy, quicker time to first fix, and anti-spoof and anti-jam capabilities. #SAT #USA [Space News](#)

ARTIFICIAL INTELLIGENCE

→ **A report from Georgetown University's Center for Security and Emerging Technologies (CSET) addresses the need for a clearly defined AI education and workforce policy by providing recommendations designed to grow, sustain, and diversify the domestic AI workforce.**

The research implies that U.S. AI education and workforce policy should have three goals:

1. Increase the supply of domestic AI doctorates.
2. Sustain and diversify technical talent pipelines.
3. Facilitate general AI literacy through K-12 AI education.

To achieve these goals, CSET proposes a set of recommendations designed to leverage federal resources within the realities of the U.S. education and training system. The first recommendation is to create a federal coordination function. CSET assesses that such a function is critical given ongoing fragmented AI education initiatives, and would harness the potential of the newly established National Artificial Intelligence Initiative Office for Education and Training within the White House Office of Science and Technology Policy. The report recommends that this office coordinates federal and state initiatives, convene key stakeholders to share lessons learned and best practices of state-level AI education initiatives, and compile and publish information on AI education and careers on a publicly available "AI dashboard."

The remaining recommendations advocate for a multipronged approach to implement policies across goals, including:

- Creating and disseminating AI educational and career information
- Establishing AI education and training tax credits
- Investing in postsecondary AI education and scholarships
- Facilitating alternative pathways into AI jobs
- Investing in PreK-12 AI education and experiences
- Integrating K-12 AI curriculum and course design
- Cultivating and supporting K-12 AI educators
- Funding AI education and careers research

#AI #USA [CSET](#)

→ **CEOs are increasingly under the microscope as some investors use AI to learn and analyze their language patterns and tone.** Investors see the technology - known as natural language processing (NLP) - as one new tool to gain an edge over rivals, according to Reuters interviews with 11 fund managers that are using or trialing such systems. NLP is a branch of AI where machine learning is let loose on language to make sense of it. The most ambitious software in this area aims to analyze the audible tones, cadence, and emphases of spoken words alongside phraseology, while others look to parse the transcripts of speeches and interviews in increasingly sophisticated ways. Advocates say NLP can unlock the untapped potential for insight from the world of "unstructured data": the calls with analysts, the unscripted Q&As, and the media interviews. Developers of current systems say they crunch tens of thousands of words at lightning speeds, extracting patterns and quantifying their degree of relation to certain significant "seed" words, phrases, and ideas, as set by the user. #AI #USA [Reuters](#)

NEXT GENERATION COMMUNICATIONS

→ **The rollout and expansion of next generation wireless technology is running up against some pandemic-related hurdles.** The move toward 5G is forcing some industries to make upgrades at a time when hiring is proving challenging and supply chain issues have led to shortages of semiconductor chips and other crucial materials. The fiber optic cable industry, which helps build out the infrastructure needed to link small cell sites together for 5G deployment, says it's unable to staff and supply much of that work. Some industries argue that the march toward 5G is coming at a bad time. As wireless carriers continue building out their nationwide 5G networks, devices that rely on older technologies may not be supported in the next year or two. And AT&T, Verizon, and T-Mobile have announced they will shut down their 3G networks in 2022. #5G #USA [The Hill](#)

FINANCIAL TECHNOLOGY

→ **The closest thing to a risk-free bet has reemerged in the cryptocurrency market as traders—awaiting the launch of the first Bitcoin exchange-traded fund—bid up the price of futures.** The spread between Bitcoin futures and the digital currency's price offers the widest annualized return in five months, according to data from FRNT Financial. That means the so-called basis trade, whereby a speculator buys Bitcoin in the spot market and sells long-dated futures to lock in the discrepancy between the two prices, has turned back on. And it's happening amid a price surge in Bitcoin that's been bolstered by optimism the Securities and Exchange Commission is poised to allow the first U.S. Bitcoin futures ETF to begin trading soon. Such a dynamic is primarily driven by individual investors, who are using futures for leverage and to make price predictions. #FIN #USA [Bloomberg](#)

→ **The U.S. has overtaken China as the largest bitcoin center after Beijing cracked down on cryptocurrency mining in recent months.** At the end of August, the U.S. controlled 35.4% of the global hash rate — the power of computers connected to the global bitcoin network — the largest percentage of all countries, according to data published by Britain’s Cambridge Centre for Alternative Finance. Kazakhstan and Russia had the second-and third-largest hash rates, respectively, according to Reuters. China’s hash rate dropped significantly over the past few months as the country cracked down on cryptocurrency, falling from 44% in May to zero in July. In 2019, it had reached as high as 75%. As we previously reported, China’s central bank announced last month that all cryptocurrency transactions in the country would be illegal, pointing to price volatility and the possibility of national security risks. China is rolling out its own digital currency, which authorities hope to trial at the Beijing Winter Olympics in February 2022. #FIN #USA #CHN #KAZ #RUS [The Hill](#) [Financial Times](#)

AEROSPACE & SPACE

→ **China demonstrated advanced space capability by testing a nuclear-capable hypersonic missile in August, reportedly taking the US Intelligence Community by surprise.** The hypersonic glide vehicle launched by the Chinese military circled the globe in low-orbit space before speeding towards its target. Although the missile missed its target by about two-dozen miles, the test took U.S. intelligence by surprise, sources told the Financial Times. The Chinese weapon can theoretically fly over the South Pole, a cause for concern for the U.S. military, whose missile systems focus on the northern polar route. China has been aggressively developing this technology, which they see as crucial to defending against U.S. advances in hypersonic and other technologies. And news of this test comes amid increasing tensions between China and the U.S., as China increases its military activity near Taiwan. According to the Pentagon, developing hypersonic weapons is currently too expensive. The DOD advised defense contractors to try and "drive towards more affordable hypersonics." The Pentagon's budget request for hypersonic research in the 2022 financial year was \$3.8B, up from \$3.2B the year before. Hypersonics are appealing, because though they aren't as fast as ICBMs (Intercontinental Ballistic Missiles), they can change their trajectory mid-flight while still moving relatively fast. This makes them much more difficult to detect, to predict, and to intercept. Strap a thermonuclear warhead to one of these things and you've got a very serious problem. And there is now evidence that China could be leading in this technology. #AER #USA #CNH #TWN [Business Insider](#) [Bloomberg](#) [The Dispatch](#)

→ **Chief of U.S. Space Operations General John W. “Jay” Raymond expressed hope for deepening cooperation with South Korea’s military.** His statements were made during a video message for the 22nd International Aerospace Symposium, a biennial event organized by the Republic of Korea Air Force. According to Raymond, the bilateral space partnership had been strengthened with the August 27 agreement reached between him and Republic of Korea (ROK) Air Force chief of staff, General Park In-ho at Peterson Air Force Base in Colorado Springs, Colorado. Under the agreement, the ROK Air Force will join U.S. Space Force-led joint

military drills aimed at bolstering the latter's defense capabilities in outer space. The two sides will also set up a joint consultative body on space policy, share information on space surveillance, and improve joint space operations capabilities such as missile defense. General Park In-ho expressed high expectations for the October 21 launch of South Korea's first domestically manufactured space launch vehicle, KSLV-2. #AER #SAT #USA #KOR [Space News](#)

→ **Senate appropriators want NASA to select a second company for its program to develop crewed lunar landers, but provided the agency with only a small increase in funding to support that.** *To recap, SpaceX won the entire HLS (Human Landing System) contract when it offered the lowest bid just before a contract decision was due and the budget was suddenly cut. All of this came to the surprise of BlueOrigin and a few other contractors who were expecting multiple companies to be selected so they legally contested the decision, drawing out the HLS timeline.* The Senate Appropriations Committee released October 18 drafts of its versions of nine appropriations bills for fiscal year 2022, including commerce, justice, and science, which funds NASA. That bill offers \$24.83B for NASA overall, slightly above the administration's request of \$24.8B but less than the \$2.504B in a House bill. NASA has struggled to win additional funding it says is needed for the Human Landing System (HLS) program to support two landers. But despite setbacks, NASA Administrator Bill Nelson is still confident that the agency will ultimately secure the funding it needs for HLS. The Senate bill did provide some good news for NASA. The committee fully funded NASA's low Earth orbit commercialization initiative, for which NASA sought \$101.1M in 2022. In the last two years, Congress provided only about one-tenth of the agency's request for that effort, which is intended to support development of commercial successors to the International Space Station. #AER #USA



#AER #USA [Space News](#)

→ **The U.S. Army will deliver its first operational rounds of its Long-Range Hypersonic Weapon to a unit in about a year from now.** The Army remains on track to meet its deadline to deliver an offensive unit by the end of fiscal 2023, according to the three-star overseeing the effort. News that the unit will receive its first live rounds follows the delivery of its first equipment for the ground-based hypersonic missile earlier in the month — including launchers, battery operations center, and modified trucks and trailers. Soldiers will now train on that hardware in preparation for the delivery of the missiles and future flight tests. According to Army Lt. Gen. Neil Thurgood, there are three flight tests planned in fiscal 2022. The Long-Range Hypersonic Weapon is part of the Army's Long-Range Precision Fires effort, a critical modernization priority as it pivots to the dispersed Indo-Pacific. Breaking Defense has previously reported that the LRHW can fly further than 2,775 km. Lockheed Martin developed a new facility for the LRHW in Cortland, Alabama. That facility will be able to produce 24 rounds annually once at full-production capacity, according to Eric Scherff, the company's hypersonic strike vice president. #AER #USA [Breaking Defense](#)

BIOTECHNOLOGY

→ **Advances in bioproduction are needed to accommodate the rapidly growing number of clinical trials in a scalable and cost-efficient manner.** At the 2021 Bioprocessing Summit, [Corning](#) introduced its Ascent Fixed Bed Reactor system, which is “an adherent cell-culture platform designed to deliver significant surface area intensification and high-yield bioproduction cost efficiently.” Because of its novel design, the platform has efficiencies greater than 90% and cell harvests with yields and viability greater than 90%. #BIO #USA [GenEng](#)

GREEN TECHNOLOGY

→ **El Salvador's unfolding experiment as a first-adopter of bitcoin could be increasingly powered by new streams of renewable energy.** Energy-intensive cryptocurrency "mining" is done by computers, and has come under criticism from environmentalists as a big source of demand for mostly fossil fuel derived electricity. As we previously reported, last month El Salvador became the first country to adopt bitcoin as legal tender alongside the U.S. dollar. In September, the Salvadoran government began harnessing geothermal energy for bitcoin mining from a plant at the base of the Tecapa volcano, 66 miles east of the capital. The plant generates about 102 megawatts, and the government plans to add another 5 megawatts next year. At present, 1.5 megawatts are being allocated for bitcoin. Alongside the plant, officials have set up a room inside a shipping container to house 300 computers that process cryptocurrency transactions. #GRN #FIN #SLV [Reuters](#)

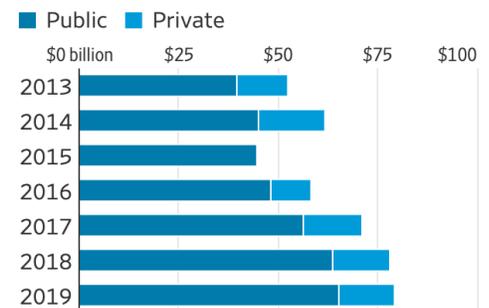
→ **Taiwan-based [Foxconn](#), the world's largest contract electronics manufacturer, introduced three electric-vehicle models Monday, October 18, marking one of the iPhone assembler's most aggressive forays yet into the EV industry.** Rather than selling them as

Foxconn-branded vehicles, they will be sold under other car brands, with Foxconn offering the basic vehicle structure and building the cars. The company is set to buy an automotive factory in the U.S. and has introduced an electric-vehicle chassis that could be used to design electric cars. Earlier this year, Foxconn claimed it would assemble more than 250K vehicles a year in the U.S. for Los Angeles-based EV startup [Fisker](#), starting in late 2023. The company also announced collaborations with other carmakers, including [Stellantis](#) and China's Zhejiang Geely. And in August, Foxconn purchased a chip plant in Taiwan that makes six-inch wafers used in cars for \$91M, which it said it would use for small-scale production and research and development. #GRN #CHP #USA #TWN #NLD #CHN [WSJ](#)

→ **Western countries responsible for the bulk of greenhouse-gas emissions have yet to deliver on their promise to help poorer nations in the expensive global energy transition.**

At the end of the month, negotiators from nearly every country will meet in Glasgow, Scotland, for a two-week climate summit, the first major gathering since governments signed the Paris accord in 2015. The goal is to keep the climate targets of the Paris agreement within reach. Before signing on, poorer countries are demanding a big increase in funding from the developed world to adopt cleaner technologies and adapt to the effects of climate change such as rising sea levels and more powerful storms. Without poorer countries on board, the world stands little chance of preventing catastrophic climate change, say many climate scientists. While emissions in the U.S. and Europe are falling, emissions in the developing world are expected to rise sharply in the coming decades as billions rise out of poverty—unless those economies can shift onto a lower-carbon path. #GRN #USA #CHN #UK #ZAF #BGD #KEN #SEN [WSJ](#)

Climate-change funding from developed countries



Note: Private contributions not available in 2015
Source: Organization for Economic Cooperation and Development

ADVANCED MANUFACTURING

→ **The U.S. Army Corps of Engineers' Automated Construction of Expeditionary Structures (ACES) program will supply rugged 3D concrete printers that can go anywhere and print (almost) anything.** ACES has produced multiple printers working with different industry partners. For example, ACES Lite was made in partnership with [Caterpillar](#) under a Cooperative Research and Development Agreement. It packs into a standard 20-foot shipping container and can be set up or taken down in 45 minutes, has built-in jacks for quick leveling, and can be calibrated in a matter of seconds, making it more straightforward than other devices. Overall the printer resembles a gantry crane, with a concrete pump, hose, and a robotic nozzle that lays down precise layers. ACES has demonstrated how it can make barracks, bridges, bunkers, barriers, or other structures almost at the press of a button. The technology is likely to spread rapidly beyond the military. Anyone carrying out construction work

in a difficult environment, from disaster relief to building communications infrastructure in remote places is likely to see the benefits. #MFG #USA [Forbes](#)

AUTONOMOUS SYSTEMS

→ [ZF](#), a German car parts maker, has partnered with [Oxbotica](#), a British autonomous vehicle software company, to develop an SAE Level 4 autonomous system. The system will first be deployed in shuttles in major cities around the world to provide on-demand passenger and goods transportation in urban areas. ZF says that the autonomous shuttle market will grow rapidly over the next decade with the potential to increase access to mobility, improve road safety, reduce congestion, and boost productivity. #AUT [ITS International](#)

→ The U.S. Navy is developing fish-inspired autonomous underwater robots that generate almost no radiated noise while navigating the ocean. The Naval Undersea Warfare Center Division intends to use “Hydraulically Amplified Self-Healing Electrostatic (HASEL) solid-state, soft actuators that mimic the form and function of biomechanical structures in large, high-performance pelagic fishes.” In doing this, the Navy appears to be interested in mimicking aquatic animals’ ability to mend their own wounds. This project falls under the Navy’s bio-inspired propulsor program, which seeks to create soft but stable fish-like machines that don’t include rotating metallic components, produce no radiated noise, and can operate in full-ocean-depth pressures. #AUT #USA [Nextgov](#)

SEMICONDUCTORS & CHIPS

→ [Alibaba](#) unveiled a new server chip design based on advanced 5-nanometer technology, a major step towards China’s pursuit of semiconductor self-sufficiency. The chip is based on micro-architecture provided by [Arm](#) and will first be used in Alibaba’s own data centers before it is sold commercially. This chip is reportedly the most advanced by a Chinese firm yet, and exemplifies China’s ambition to build a homegrown semiconductor industry. Lately, Alibaba has answered Beijing’s call to invest in cutting-edge technologies and manufacturing capacities. In addition to the server chip Alibaba has also introduced an AI chip and a chip used for IoT. Nevertheless, China still does not have the capability to manufacture 5nm chips - only Samsung and TSMC can do so. #CHP #CHN [Bloomberg](#)

→ [Amazon Web Services CEO Adam Selipsky](#) said that AWS plans to design more of its own semiconductors, stressing cost benefits for clients. One of the latest chips designed by AWS is called Graviton2, which is a data center processor chip that has 40% better price performance than Intel’s comparable x86 chips. In addition to Graviton2, Amazon is also working on a networking chip for hardware switches that move data around networks. Many believe that the pandemic-induced chip shortage will accelerate Amazon’s – and other firms’ – efforts to make their own chips. #CHP [CNBC](#)

QUANTUM TECHNOLOGY

→ **UK-based [BT](#) and Japan-based [Toshiba](#) will build a commercial quantum-secured network to protect sensitive data from quantum-computer-enabled cyberattacks.** This network will cover three of London's high-tech centers, and it is the first of its kind for the private sector. It will provide secure data services using Toshiba's quantum key distribution (QKD) and post-quantum cryptography (PQC), deployed across BT's Openreach Optical Spectrum Access Filter Connect (OSA FC) solution. The network will transmit thousands of quantum encryption keys per second – BT and Toshiba claim that their QKD-based security is unique because the key-exchange is secure against computational and mathematical advances, making it immune to attacks by quantum computers. #QNT #GBR [OPN](#)

→ **Researchers at the Institute of Scientific and Industrial Research (SANKEN) at Osaka University trained a deep neural network to accurately determine the output state of quantum bits (qubits).** To compensate for the fact that quantum mechanics does not follow the binary logic of modern computers, new experimental systems can achieve computing power by allowing qubits to be in “superpositions” of 1 and 0, but recording the output of each qubit is often difficult. The team at SANKEN, however, used a deep neural network to measure a qubit state even with noisy signals. #QNT #JPN [Phys.org](#)

GEOPOLITICS

→ **Facebook agreed to pay a penalty after being accused of illegally reserving jobs for immigrant workers it was sponsoring for permanent residence instead of hiring U.S. workers.** As part of the settlement with the U.S. government, Facebook will pay the government \$4.75M and \$9.5M to eligible victims of the discrimination. The Labor Department will also investigate Facebook's current program to obtain applications for foreign workers and future filed ones for the next three years. Facebook will also be required to train employees on anti-discrimination requirements of the Immigration and Nationality Act, conduct more advertising and recruitment for its job opportunities, and accept electronic applications for U.S. workers who apply. #Geopolitics #USA [WSJ](#)

→ **The Biden administration plans to limit and revise the use of economic and financial sanctions after a Treasury-led audit of sanctions policy.** Officials from the Treasury Department said that sanctions will remain a crucial policy tool, but the interagency vetting process for them will be reformed to consider inadvertent harm to vulnerable groups, resistance from allies, and other economic and geopolitical fallout. After the increased use of sanctions by successive administrations, this policy overhaul is meant to ensure that sanctions remain effective and legitimate. In addition, another aspect of the Biden administration's strategy is securing international cooperation for sanctions so as to reduce channels for evasion by sanctions targets. #Geopolitics #USA [WSJ](#)

→ **China's recent 14th Five-Year Development Plan calls for increasing R&D spending in top five high-tech areas and other advanced technologies by 7% per year from 2021 to 2025.** The five tech areas are as follows:

1. **AI** – In 2017, China started its path to AI domination with the New Generation Artificial Intelligence Development plan, which included policy support and \$150B worth of investments. Two years later, the number of Chinese AI firms had reached 1,189, second only to the U.S.
2. **Quantum** – Although the U.S. still leads in quantum computing, it is hanging by a thread. Recently, China's Zuchongzhi programmable quantum computer surpassed Google's best quantum computer in solving the most complex problems that even the fastest supercomputers cannot even solve.
3. **Semiconductors** – While China only holds 7.6% of the market for global chip sales, it is making efforts to reach 70% self-sufficiency by 2025. In addition, the government funded \$21B for semiconductors development in 2014, followed by another \$35B in 2019. China has also announced more than 15 local governments funds worth \$25B dedicated to funding Chinese semiconductors. This scale of funding is unmatched in other countries.
4. **Brain science** – China plans to use brain-computer interfaces for military purposes and civilian use. The China Brain Project, announced as a part of the 13th Five-Year Plan, gave \$1B of funding through 2030.
5. **Genomics and biotech** – Given that President Xi sees biotech as a focus for R&D, many are concerned that it is developing deadly and contagious superviruses as bioweapons.

#Geopolitics #CHN #USA [National Review](#)

→ **Russia is halting its diplomatic mission to NATO after NATO expelled eight members of Russia's mission to the alliance who were thought to be undeclared intelligence officers.** Russia's Foreign Minister Sergei Lavrov claimed that because NATO is not interested in equitable dialogue and cooperation, there will be no change in the foreseeable future. Russia has long accused NATO of proactive activity close to its borders and staged its own exercises in September. NATO, however, remains committed to reinforcing the security of its member states near Russia after Crimea's annexation by Russia and its support for Ukrainian separatists.

#Geopolitics #RUS #NATO [Reuters](#)

CYBERSECURITY

→ **Chinese security researchers took home \$1.88M after hacking the world's most popular softwares at Tianfu Cup, China's largest hacking competition.** In July, the organizers of the competition announced 16 targets, and participants had months to prepare exploits that they would execute on the contest stage. The most hacked softwares included Windows 10 (5 times), Adobe PDF Reader (4 times), and Ubuntu 20 (4 times). This year's competition was also significant because one of the iOS exploits showcased last year was used

in a cyber-espionage campaign made against the Uyghur population by Beijing. This reinforced the Western belief that China forbade its security researchers from participating in hacking contests in years past in order to use their exploit-creating capabilities for itself. #CHN #Cybersecurity [The Record](#)

TFC 2021 Targets & Prize			
Target	2021TFC Prize(RCE)	2021TFC EXTRA Prize(RCE + Sandbox Escape)	Note
Chrome	\$50,000	\$150,000	
Safari	\$40,000	\$75,000	M1:RCE=\$60000; M1: RCE+Sandbox=\$120000
Adobe PDF Reader	\$30,000	\$40,000	
Docker-CE	/	\$60,000	
Ubuntu 20/CentOS 8	/	\$40,000	
Microsoft Exchange Server 2019	\$60,000	\$200,000	
Windows 10	\$20,000	\$40,000	
VMware Workstation	/	\$80,000	
VMware ESXi	/	\$180,000	
Ubuntu + qemu-kvm	\$60,000	\$150,000	
Parallels Desktop	/	\$30,000	
iPhone 12 pro	\$120,000	\$180,000	Remote Jailbreak : \$300000
Domestic mobile phones(Android)	to be updated	to be updated	Please contact us for the details of the brand and model.
Synology DS220j	/	\$10,000	
ASUS Router AX56U	/	\$10,000	
Domestic vehicle	to be updated	to be updated	

→ **REvil, a ransomware gang behind a series of cyberattacks in recent years, has disappeared again after a month the gang staged a surprise return following a two-month hiatus.** A member affiliated with REvil posted on the XSS hacking forum that unknown actors took control of the gang’s payment portal and data leak website, causing the sudden disappearance. REvil is most well-known for its attacks on JBS and Kaseya earlier this year, reflecting the trend of cybercriminals targeting critical infrastructure. Australian cyber experts from [Risky.Biz](#) believe this event may likely be the result of stepped-up law enforcement action against ransomware actors. #Cybersecurity [The Hacker News](#)

→ **Chris Inglis, the first National Cyber Director is pressing ahead on his agenda despite a lack of funds for his new office.** The Office was created to strengthen government action in defending the private sector and assisting it in protecting critical infrastructure. Inglis still lacks a full staff and the funding for his office – \$21M – is still stuck in the political spin cycle. Despite that, Inglis has grand ambitions. The first thing on Inglis’ agenda is to streamline the roles in government of who handles what when it comes to dealing with cyberattacks. He also seeks to allocate resources towards building a common digital standard by installing basic procedures like multifactor authentication and encryption of data. Another priority for Inglis is to get the government to share ‘valuable material.’ He says that “We could perhaps address and reduce liability or give companies a clue as to what might be around the corner because the government has access to exquisite intelligence. If that setup is possible, we also need a venue where collaboration takes place.” Regarding cooperation, Inglis is a big advocate of ‘collaborative integration,’ referring to international relationships in the cybersecurity space and

collaboration between private and public sector officials to advance security. #Cybersecurity #USA [The Cipher Brief](#)

Thursday, CISA is hosting a webinar introduction of the JCDC which aligns with the NCD's goal of establishing a place for public-private information sharing. Register [here](#).

SUPPLY CHAINS

→ **The International Monetary Fund cut Asia's economic growth forecast to 6.5% from 7.6% for this year, citing a new wave of COVID-19 infections, supply chain disruptions, and inflation pressures.** However, the IMF did raise its Asia growth forecast for 2022 to 5.7% from 5.3%, reflecting progress in vaccinations. The IMF also stated that the divergence between advanced and emerging markets in Asia is growing. For instance, advanced economies like South Korea and Australia benefit from high-tech and commodity booms, while emerging economies like the ASEAN countries still face challenges from a resurgent virus and low service consultation. Overall, the IMF is most concerned about new infection waves, hampering Asian economic recovery. #SCRM [Reuters](#)

→ **As supply chains face mounting pressure during the pandemic, they are becoming more vulnerable to cybersecurity threats.** Current supply chain risk programs are outdated. For instance, assessments are largely manual relying on spreadsheet-based, point-in-time questionnaires. Additionally, these assessments are also infrequent – a recent Information Security Forum (ISF) report found that 54% of surveyed members who conducted on-site security assessments on critical or high-risk suppliers only do it less than once a year. In order to alleviate cybersecurity risk in the supply chain, a few approaches can be taken:

1. **Reformulate governance** – Supply chain cybersecurity should be brought to the forefront of organizational models and integrated into the core business. Supply chain and cybersecurity teams need greater collaboration and should be scrutinized by executives.
2. **Rationalize suppliers** – By decreasing the number of suppliers, companies can easily monitor and trust their supply chains. Companies should also establish baselines for supplier cybersecurity expectations and outline penalties and incentives based on KPIs.
3. **Automate awareness** – Companies must conduct frequent monitoring by using new technologies and better tools. Instead of point-in-time assessments, threat intelligence and risk ratings should be used to modernize supply chain control.
4. **Assume that your ecosystem will be breached** – Pressure testing supply chains is key. Incident response planning and attack simulations must also involve the participation of suppliers instead of just the company's ecosystems.

#SCRM #Cybersecurity [Boston Business Journal](#)