



SHIELD
by SOURCEREE



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National Security Newsletter

November 2021



In our November 2021 SHIELDWatch Newsletter, we touch on several current world updates. From NASA's launch program to stagnated port operations, from advances in computing, to digital identities. In our first article, we look to the future of computing. China has created the first functional Exascale Computer (that's about a thousand times faster than the nearest competitor of the past). This technology could mean drastic leaps in computation speed, data science, predictive analytics, and machine learning. The United States is not far behind. The second article looks at NASA's future operations plans. The Government Agency is seeking to sell the production rights of their launch systems to a private industry. This would allow the Agency to focus on longer-term missions, while industry maintains near-term programs like space station upkeep. NASA would buy back the manufactured rockets at what they hope to be half the current price of production, while the industry awarded the contract maintains the right to sell launch services to the international community to offset construction costs. NASA would maintain the backbone, as the contract would allow for at least one launch by NASA each year for the next thirty years. Whichever organization is awarded the contract will gain a significant stake in the space industry. Our third reflection looks closer to home, with President Biden's work to alleviate the backlog of container ships surrounding the Ports of Los Angeles and Long Beach. A myriad of issues have plagued the ports, leading to ships anchored around the ports for far longer than predicted – time which is lost for the movement of the world's supply chains. Former Estonian President Kersti Kelajulaid commented on the program in a broadcast by Foreign Policy, stating the program has been in the works for decades, and allows the citizens of Estonia a measure of control over their digital identity which is unmatched anywhere else in the world.

--Adam Murphy, Sourcing President



Exascale computing: What it is and what it could be

Sreenivas Rangan Sukumar & Mike Woodacre

Hewlett Packard Enterprise

13 October 2021



By the end of October 2021, the National Supercomputing Center in Wuxi, China, had unveiled their newest homegrown Sunway supercomputer. This system sets a new benchmark for computing speeds, reaching as high as 1.3 exaflops (that's 1.3 billion billion floating point operations per second, a full thousand times more powerful than the petaflop supercomputers from 2008, and fifty times more powerful than the next competitor today). The power of this kind of computer improves the capability to study or model phenomena that would otherwise be too cumbersome. Exascale computing may drive breakthroughs in energy production, storage, and transmission; materials science; manufacturing; chemical design; artificial intelligence and machine learning; medical research; natural disaster risk assessment; and many other areas. However, building an exascale system requires an immense number of microchips – which has been suffering from a supply problem for several months. Both the United States and China have been in a computing arms race to develop exascale computers, but both have previously struggled with supply shortages. China has evidently found a workaround by developing their own home-grown Sunway chips, rather than relying on industry production.

Select excerpts from the piece:

For a half century, supercomputers have performed some of the most futuristic tasks imaginable, meeting and often exceeding science fiction writers' most creative scenarios. They've helped simulate nuclear tests, map the human brain, build better and safer cars, generate breathtaking graphics for movies, and teach self-driving cars the difference between a garbage can and a baby carriage.

Now, supercomputers are about to enter a new era. A decade after the introduction of the first petascale system, the first computers capable of crunching numbers at exascale levels are set to be installed at government labs.

An exascale computer is one that can perform a quintillion, or 10^{18} , floating point operations per second (FLOPS). That's a billion billion—or 1,000,000,000,000,000,000. To put that number in perspective, the Milky Way galaxy is 1 quintillion kilometers wide, and it would take 40 years for 1 quintillion gallons of water to flow over Niagara Falls. Further, you'd need every single person on earth calculating 24 hours a day for more than four years to do what an exascale supercomputer can do in 1 second. The concept of exascale computing, in sheer numbers, is mind boggling.

Traditionally associated with universities and big national laboratories, supercomputers have long been running everyday applications for private industry that range far beyond basic science. Industries such as oil exploration, finance, personalized content delivery, and online advertising are deploying high-performance computing (HPC) systems to manage heavy workloads delivering real-time services.

Imagine what exascale computing could do in a lab where researchers are testing out remedies for a disease. These machines have up to 1,000 times more power than the first petascale computers. They can crunch processing time down from weeks to days and from days to minutes. They can connect and combine inputs from more sources, create more powerful models, and run more frequent simulations to see what works. Rather than wait weeks for feedback, teams can determine, say, whether a potential pharmaceutical compound is worth pursuing in just a few hours.

Exascale computing will give scientists breakthrough capabilities by helping them do their work faster, but speed is just the beginning. By allowing them to generate models orders of magnitude faster than they used to, exascale can start to change the very way that science is done.

More power means more innovative solutions across industries. In financial services, time is money. Supercomputers performing at exascale can reduce latencies enough to provide an edge in trading transactions. In manufacturing, high-powered systems can determine if a new 3D print material will stand up to day-to-day swings in temperature and pressure. The shipping industry can use exascale computers to determine which paths to take based on water temperature, wind direction, political factors, and prevailing costs.

Exploration Production and Operations Long-Term Sustainability

National Aeronautics and Space Administration

10 November 2021

The National Aeronautics and Space Administration has asked the US aerospace industry to help unburden the government's expenditure on space travel. In a 10 November 2021 Request for Information (RFI), NASA is petitioning the private industry base to submit proposals to effectively take over the manufacture and sustainment of the Space Launch System (SLS). The chosen company will gain access to several government owned buildings to aid in the manufacture of the proposed space lift systems and will sell the use of the systems to NASA for approximately half of the current (undisclosed) launch price. Estimates place the cost at around \$2 billion per launch. By turning to the economy, NASA hopes to draw on expertise in reusable rocket technologies, gain access to scientific missions, and market to the global community. NASA would remain as the "anchor tenant" of the launch system, procuring one crewed flight per year for the next 10+ years, while the system would be available to others when not in use by NASA.

From an economic standpoint, this RFI could mean a single massive contract to whichever business acquires it, as the program is currently expected to run for the next 30 years. Companies along the entire supply chain to the awarded contractor will require additional securities to dissuade the possibility of sabotage or espionage as it would also provide direct access from the industry base to controlled information, sensitive sites, and proprietary technology. Additional vetting of all personnel and suppliers involved will be paramount.

NASA's proposal is first accepting proposals on 10 November 2021 during a virtual forum, with responses from industry due on 27 January 2022.

Select excerpts from the piece:

The National Aeronautics and Space Administration (NASA) invites industry to submit responses to this Request for Information (RFI) to assist NASA in maximizing the long term efficiency and sustainability of the Exploration Systems Development (ESD) programs, including the Space Launch System (SLS), Exploration Ground Systems (EGS) and Cross-Program Systems Integration (CSI) office by minimizing production, operations, and maintenance costs.

With the ESD programs now preparing for the first flight of the Artemis missions (Artemis I), and with the flight hardware for Artemis II and beyond in production, NASA is transitioning from design and development to long-term affordability and sustainability within a broader exploration framework. In this evolving environment, NASA is looking to transform the current traditional acquisition approaches to an overall acquisition strategy of a service provider for the integrated vehicle system in partnership with the Consolidated Operations, Management, Engineering and Test (COMET) service provider for the ground systems and launch operations in order to evolve into an integrated launch service available to NASA and other customers in both the public and private sectors.

NASA is seeking industry input to maximize the long-term efficiency of the ESD programs to ensure an affordable and sustainable SLS, EGS, and CSI including Orion/payload integration, which will be referred to as the Exploration Transportation System (ETS).

The vision for the ETS is to establish it as a long-term (30 years or more) national capability that is a sustainable and affordable system for moving humans and large cargo payloads to cis-lunar and deep-space destinations for NASA and to these and other orbits for other government and non-government users. This model assumes the current government-owned and government-led system will be moved to industry. While NASA will retain at least government purpose rights to intellectual property of the system; industry will produce, operate and effectively “own” the system.

The primary goals enabling this vision include

- 1) moving ESD programmatic implementation to a construct in which industry owns vehicle production and the flight hardware, and leads the ground operations services
- 2) production, operations, and maintenance costs at a substantial savings of 50% or more off of the current industry baseline per flight cost with a flight rate of one crewed flight and potential for at least one cargo flight per year (costs are inclusive of Orion/payload and system integration but exclusive of the Orion hardware, payload hardware, government personnel and government facility costs)
- 3) a programmatic construct that is a launch service (across 2 contracts) available for additional customers, including other government agencies, international partners, and commercial entities.

NASA is seeking industry inputs on transitioning from the current government owned, integrated, and operated system to an industry provided ETS that is a launch service across two contracts. The current government reference model is to consolidate the current SLS contracts to a single corporate entity (which could be a single prime, a corporate partnership, or other business entity) to produce and operate the 42+t TLI capability. This consolidated contract will be referred to as the Exploration Production and Operations Contract (EPOC), and will be responsible for the ETS hardware production, operations, maintenance, evolution, and system integration up through TLI. In addition, EPOC will work in unison with the Kennedy Space Center (KSC) COMET service contract which includes ground operation, integration, and launch; until end-of-service/TLI. The EPOC contract is envisioned to be a contract in which NASA will purchase launch services and payload delivery, but not take ownership of the flight hardware. The separate KSC COMET contract to support this activity will also not be taking delivery of the hardware, and it will play an equally important role in the overall launch service, but it is not the main point of query of this RFI. The interfaces, domains, and roles and responsibilities between EPOC and the KSC contract are in the process of being defined, and the relationship between the two contracts is critical to the success of the ETS. NASA is seeking industry inputs regarding roles and responsibility, contract structure, incentives for corporate cooperation, and/or unique business arrangements between these two contracts that could lead to

a cost-effective ETS while ensuring mission success. The goal is to have the consolidated contract (EPOC) in place by December 2023 to support the beginning and/or transition of flight hardware sets for Artemis V and beyond.

NASA will make available to the EPOC entity the majority of government-owned facilities used in the production, operations and maintenance of the EPOC system. NASA will make available the facilities used to support these tasks, and will partner with industry on upgrades, modifications, etc. on an as-appropriate basis. It is expected that the current government-owned facilities will remain as such, and that some facilities will be designated Industrial Operating Zones or could become government-owned/contractor operated. These might include (but are not limited to):

1. Select facilities at Marshall Space Flight Center (MSFC)
2. Portions of the Michoud Assembly Facility (MAF)
3. Booster Fabrication Facility (BFF)
4. Stennis Space Center (SSC) Testing
5. Section of the Vehicle Assembly Building (VAB)

FACT SHEET: Biden Administration Efforts to Address Bottlenecks at Ports of Los Angeles and Long Beach, Moving Goods from Ship to Shelf

The White House Briefing Room
13 October 2021

For the last several weeks, the news has been abuzz with reports of backed up cargo ships anchored around the ports of Los Angeles and Long Beach. The global supply chain is under intense pressure from labor shortages, dwindling raw materials, and overburdened warehouses. All this creates bottlenecks during a time when shoppers are looking to spend.

2021 Port of Los Angeles Container Statistics (Year-To-Date)

	Loaded Imports	Empty Imports	Total Imports	Loaded Exports	Empty Exports	Total Exports	Total TEUs	Prior Year Change
January	437,609.20	254.00	437,863.20	119,326.75	278,326.25	397,653.00	835,516.20	3.64%
February	412,884.25	1,270.25	414,154.50	101,208.15	283,952.75	385,160.90	799,315.40	46.92%
March	490,115.00	3,350.25	493,465.25	122,899.00	341,235.00	464,134.00	957,599.25	113.00%
April	490,126.85	4,554.75	494,681.60	114,448.50	337,836.25	452,284.75	946,966.35	37.44%
May	535,714.20	5,088.90	540,803.10	109,886.00	361,358.75	471,244.75	1,012,047.85	73.99%
June	467,763.25	1,790.35	469,553.60	96,066.75	310,810.00	406,876.75	876,430.35	26.75%
July	469,360.85	120.70	469,481.55	91,439.50	329,878.75	421,318.25	890,799.80	4.02%
August	485,672.15	3,201.70	488,873.85	101,292.00	364,211.50	465,503.50	954,377.35	-0.78%
September	468,059.15	1,510.95	469,570.10	75,713.50	358,581.00	434,294.50	903,864.60	2.29%
October	467,286.65	1,426.95	468,713.60	98,251.25	335,679.05	433,930.30	902,643.90	-7.96%
November								
December								
Total Calendar Year 2021	4,724,591.55	22,568.80	4,747,160.35	1,030,531.40	3,301,869.30	4,332,400.70	9,079,561.05	21.96%
Total Fiscal Year 2021/22 (in progress)	1,890,378.80	6,260.30	1,896,639.10	366,696.25	1,388,350.30	1,755,046.55	3,651,685.65	-0.84%
Total Fiscal Year 2020/21 (ended June 30, 2021)	5,710,619.80	30,339.95	5,740,959.75	1,447,131.60	3,691,291.50	5,138,423.10	10,879,382.85	27.08%

Source: Port of Los Angeles Container Statistics (<https://www.portoflosangeles.org/business/statistics/container-statistics>)

The overarching theme amongst all the data is that COVID-19 is the culprit behind the backup. And essentially, this is true, but doesn't cover the reasoning. The full reasons come from a backup at every level of the supply chain and drastic swings in volume. At times, the Port of Los Angeles saw fewer than a million containers (March 2020) then nearly doubling to 1.8 million just a year later (March 2021). Leading maritime economist John Martin, Ph. D., highlights the broad scope and systemic nature of the cargo congestion that continues to hamper goods movement throughout the country. Martin found that much of the congestion originates far from the docks. Warehouses are filled, causing back-ups all the way to port terminals, made worse by shortages of shipping containers, rail cars, trucks,

and chassis to meet the enormous demand. These dynamics have driven delays, shortages, and increased prices at retailers nationwide.

One message, which has gone viral, claims the backup of trucks to unload is in part due to California's trucking laws, which require trucks to have updated (more ecologically friendly) engines, removes the ability of owner-operators to work in the state, and blames California legislation. However, the ports of Los Angeles and Long Beach have both had stricter rules than those being weighed currently, so it is unlikely these had anything to do with the backup. Instead, it is the lack of workers at every level of the supply chain, and the resurging strains of COVID-19 bogging down a system trying to recover.

President Biden has created a Supply Chain Disruptions Task Force, which has attempted to make some headway in this battle by opening the Port of Los Angeles to 24-hour operations and has teased at the possibility of sending in the National Guard to help. Time will tell if these efforts are enough as the Christmas holiday season begins, and shipping becomes even more burdened.

Select excerpts from the piece:

[A]s the country recovers from a once in a century pandemic and economic crisis, the private businesses that make up our supply chains, which get goods to businesses and the American people, have struggled to keep up. The pandemic has led to a surge in e-commerce, with sales increasing 39 percent in the first quarter of 2021 compared to the first quarter of 2020. At the same time, COVID has disrupted workers in key transportation and logistics nodes – the jobs of 1,800 Southern California port workers were disrupted because of COVID earlier this year.

These disruptions are not just happening here at home, but all around the world as COVID has led to global shutdowns and disruptions. The Chinese ports of Yantian (Shenzhen) and Ningbo-Zhoushan—two of the top 5 largest ports in the world—each experienced multi-week partial-terminal closures aimed at curbing COVID outbreaks, slowing global supply chains due to increased dwell times and cancelled sailings. In September, hundreds of factories closed under lockdown restrictions in Vietnam, halting production that supports thousands of retailers worldwide. They have been slowly reopening in early October but must still contend with mounting supply chain issues. These disruptions have made the transportation supply chain more unstable and difficult to predict.

[B]y moving towards 24/7 operations at the Ports of Los Angeles and Long Beach. These two ports are the point of entry for 40 percent of containers to the U.S. and are on track to reach new highs in container traffic this year. Through August, Los Angeles has moved 30% more and Long Beach over 20% more containers to help U.S. exporters reach customers around the world and U.S families and factories get the goods they need.

The Port of Los Angeles is expanding to 24/7 operation. The Port of Long Beach expanded operations in mid-September. The Port of Los Angeles is now joining them by adding new off-peak nighttime shifts and weekend hours. This expansion means the Port of Los Angeles has nearly doubled the hours that cargo will be able to move out of its docks and on highways.



Large companies are announcing they will use expanded hours to move more cargo off the docks, so ships can come to shore faster. Unlike leading ports around the world, U.S. ports have failed to realize the full possibility offered by operation on nights and weekends. Moving goods during off-peak hours can help move goods out of ports faster. For example, at the Port of LA, goods move 25 percent faster at night than during the day. These commitments will help unlock capacity in the rest of the system—including highways, railroads, and warehouses—by reducing congestion during the day.

What is Estonian e-Residency and how to take advantage of it?

SOLO

After a majority vote won by the conservatives of Britain, the country exited the European Union (EU) on 31 January 2020. With the exit comes a myriad of legal and entrepreneurial changes. One of the most important of the changes is the sudden disruption of business dealings with the rest of the EU. Thousands of businessmen have since registered for e-Residency in the nation of Estonia. The program, which began in 2014, offers the ability to conduct business internationally completely online – from registering as an e-Resident, to opening a bank account, starting a business, and signing legal documents. The entire process reportedly takes 2-4 weeks from start to finish and allows anyone in the world to conduct business within the EU and take advantage of Estonia's light business tax laws.

In Foreign Policy's Tech Forum (17 November) Kersti Kelajulaid, former President of Estonia, stated her country has been working on this framework for several years. The European nation has been building not only the infrastructure to allow for the digitization of identification and its implications for their citizens, but also in the societal norms for adoption of these processes throughout their citizenship. In doing so, Estonia has created a system in which the people are given much more control of their own identity and who has access to that information. She gave the example of the United States' driver's license – which is almost exclusively tracked through a paper trail. In order to find out who has access to the information on a license by an American citizen, it would take a significant amount of forensic effort and may be inconclusive in the end. However, in a digital system, there is no cost to verify that information and every citizen can see who has access to their information easily. The same has been extended to data – when a citizen creates data, it may be used by others, but ultimately will always belong to that citizen. She hopes the rest of the world will follow suit, allowing for a digital identity for every person on Earth.

Select excerpts from the piece:

When you sign up for Estonian e-Residency, you receive a government-issued smart ID card that provides digital identification and authorization. That way, you can digitally sign important documents, access secure services, and make secure transactions - even if you don't live in Estonia.

For example, e-Residency would allow an Indian entrepreneur to establish an Estonian company that he runs from Singapore to serve clients based in Germany. He'd also be able to use his digital signature to sign contracts with customers throughout the European Union. All of it would be done online, remotely, and completely hassle-free.

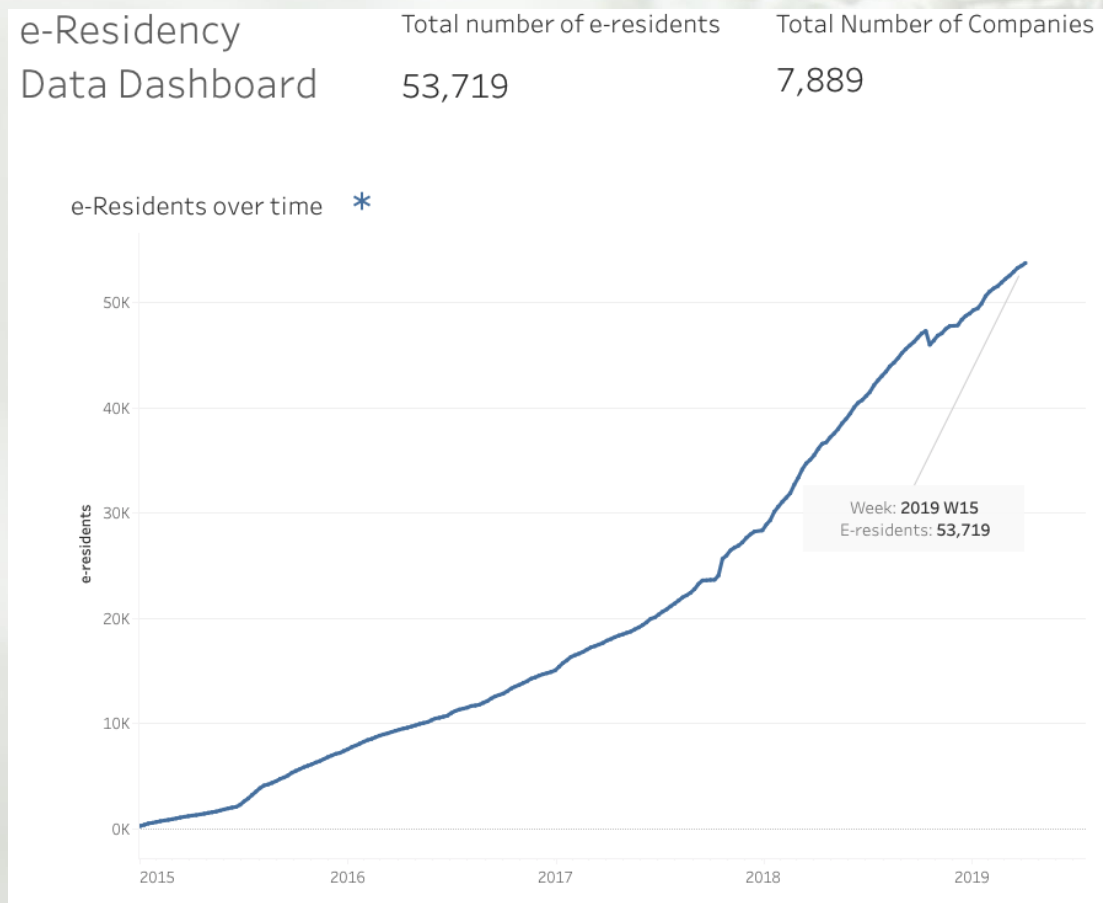
e-Residents are given a digital ID card that contains a special chip. This card enables them to use Estonian public and private sector services and resources, sign documents remotely, and encrypt files.

While e-Residency is a new concept, the idea of a government-issued digital ID card is not. In fact, Estonians have been using these cards for more than a decade. Since Estonia is often called

"e-Estonia" because of its technological advances, it made perfect sense to expand this digital ID service to the rest of the world. By extending virtually every public and private sector transaction to people in other countries, Estonia has created long-term value in the idea of secure digital identities, especially when it comes to commercialized Platform-as-a-Service (PaaS).

The main goal of the e-Residency program is to make life and business significantly easier for freelancers, digital nomads, business owners, international partners, and any other non-resident who has a relation to Estonia. Whether you want to start a business, expand your business, make investments, or study in the European Union, Estonian e-Residency makes it both possible and simple.

In a world where businesses, people, and money can move around with relative ease, having a competitive tax code has become even more important to economic success. According to the latest figures released by the US-based Tax Foundation, Estonia has the most competitive tax system in the OECD (International Tax Competitiveness Index Rankings) and shares a place at the top of list for Internet Freedom.



Estonia has a unique income tax system where corporate income tax is charged on profit distribution (i.e., dividends) only, and is capped at 20%. As long as you keep your profits within the company, you won't have to pay any corporate income taxes. And, Estonia has a flat 20% tax on individual income that does not apply to personal dividend income.

Protected by



SHIELD

by SOURCEREE

Sourceree's SHIELD program is a comprehensive supply chain risk management (SCRM) solution designed to help answer questions about supply chain disruptions and risks, particularly foreign investment.

- Software platform for on-demand supply chain risk assessments and financial intelligence data

- Analytical Support

- Business intelligence reports on critical suppliers