
Oversight for Frontier AI through a Know-Your-Customer Scheme for Compute Providers

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Abstract

To address security and safety risks stemming from highly capable artificial intelligence (AI) models, we propose that the US government should ensure compute providers implement Know-Your-Customer (KYC) schemes. Compute – the computational power and infrastructure required to train and run these AI models – is emerging as a node for oversight. KYC, a standard developed by the banking sector to identify and verify client identity, could provide a mechanism for greater public oversight of frontier AI development and close loopholes in existing export controls. Such a scheme has the potential to identify and warn stakeholders of potentially problematic and/or sudden advancements in AI capabilities, build government capacity for AI regulation, and allow for the development and implementation of more nuanced and targeted export controls. Unlike the strategy of limiting access to AI chip purchases, regulating the *digital access* to compute offers more precise controls, allowing regulatory control over compute quantities, as well as the flexibility to suspend access at any time. To enact a KYC scheme, the US government will need to work closely with industry to (1) establish a dynamic threshold of compute that effectively captures high-risk frontier model development, while minimizing imposition on developers not engaged in frontier AI; (2) set clear requirements and guidance for compute providers to keep records and report high-risk entities; (3) establish government capacity that allows for co-design, implementation, administration and enforcement of the scheme; and (4) engage internationally to promote international alignment with the scheme and support its long-term efficacy. While the scheme will not address all AI risks, it complements existing proposed solutions by allowing for a more precise and flexible approach to controlling the development of frontier AI models and unwanted AI proliferation.

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Executive Summary

Emerging risks associated with the development of frontier AI models¹ warrant additional regulatory intervention by the US government. The potential of these AI capabilities to enhance adversarial military capabilities and facilitate human rights abuses has led the US to introduce export controls that restrict exports of the specialized AI chips required to develop and deploy large AI models, among other restrictions. Yet gaps in these controls have emerged: there are currently no restrictions on entities accessing controlled chips and their associated computing power through digital means, such as cloud compute provision, offering a potential avenue for adversarial militaries and non-state actors of concern to benefit from US technology. While a blanket ban on cloud access could harm US technology leadership and would be difficult to enforce, there are clear security grounds for addressing these proliferation risks.

At the same time, broader risks to security and public safety are eliciting concern and a willingness to act from industry and government alike. Experts in industry and academia are warning of significant misuse risks, such as AI increasing the availability of biological weapon information and incentivizing malicious actors to attempt their development,² as well as increasing risks of misinformation and electoral interference. US AI leaders have committed to following voluntary guidelines,³ but as noted by Senator Blumenthal, Chair of the Senate Judiciary Subcommittee on Privacy, Technology, and the Law, ‘there will be regulation. The only question is how soon, and what.’⁴ As the home to leading players in the AI industry and supply chain, the US is uniquely positioned to shape regulatory approaches. Yet interventions will need to carefully balance maintaining US influence and industry power with providing avenues to effectively identify and mitigate critical risks.

Across these proliferation, safety, and security risks, compute – the computational power and infrastructure required to train and run these AI models – offers a key node for oversight and control. The quantity of compute required for frontier AI models has resulted in cloud compute forming a key part of the AI supply chain, with the US as the global leader in AI compute provision. Alongside other potential regulatory interventions,⁵ increasing oversight of AI compute could enable earlier identification of emerging risks and more targeted responses.

This paper recommends that the US government implement a Know-Your-Customer (KYC) scheme for AI compute providers, most notably Cloud Service Providers (CSPs), to enable greater oversight of the development of frontier AI models. Such a concept has already been proposed by Microsoft,⁶ as well as AI researchers,⁷ as a way of increasing accountability and managing risks. Implemented in partnership with industry, a KYC scheme has the potential to warn of significant advances in AI capability, build government capacity in AI regulation, and allow for more nuanced and targeted controls. This scheme could be accompanied by updated Export Administration Regulations that restrict the provision of above-threshold compute to companies on the Entity List. Beyond export controls, a KYC scheme could provide the groundwork for domestic safety regulations and support responsible AI development. The KYC scheme could be designed to leverage existing technical metrics and preserve privacy for compute providers and customers. This paper draws on lessons learned from the mature application of KYC in the financial sector to propose the development of a KYC scheme for compute providers. It recommends that the US government work with industry to:

1. Defined as ‘highly capable foundation models that could exhibit dangerous capabilities’, Anderljung et al., *Frontier AI Regulation*

2. Zakrzewski, Lima, and DiMolfetta, “Tech leaders including Musk, Zuckerberg call for government action on AI.”

3. Kang, “In Show of Force, Silicon Valley Titans Pledge ‘Getting This Right’ With A.I.”

4. *Oversight of A.I.*

5. Such as interventions at the model and applications levels, as proposed by Microsoft. Smith, *Developing and Deploying AI Responsibly: Elements of an Effective Legislative Framework to Regulate AI*.

6. Smith, *How do we best govern AI?*

7. Fist, Heim, and Schneider, *Chinese Firms Are Evading Chip Controls*.

1. **Establish a threshold of compute for the scheme** that effectively captures high-risk frontier model development,⁸ while minimizing imposition on developers not engaged in frontier AI. The threshold should be defined by the total amount of computational operations – a metric easily accessible to compute providers, as they employ chip-hours for client billing, convertible to total computational operations. Additionally, this threshold would need to be dynamic and subject to periodic reassessments by government, in close consultation with industry, to remain in step with developments in training efficiency as well as broader societal changes. It would also need to be supported by collaboration between compute providers, as well as with government, to minimize evasion risks.
2. **Set clear requirements for compute providers**, including requirements for gathering information, implementing fraud detection, keeping records, and reporting to government any entities that match government-specified ‘high-risk’ profiles. These requirements should be technically feasible, resilient against efforts to evade detection and enforceable, while preserving privacy.
3. **Establish government capacity** within the US Department of Commerce that allows for the co-design, implementation, administration, and enforcement of the scheme. This capacity should draw on existing expertise within the US government, as well as contribute to a deeper understanding of AI regulatory challenges to inform broader policies.
4. **Engage with international partners** to promote alignment with the scheme. While the US, as a significant global compute provider that wields substantial influence in the semiconductor supply chain, can exert broad influence through a domestically implemented scheme, cooperation with international partners will be a key enabler of increased oversight in the longer term. Consistent international standards will help ameliorate the risk of diminishing US AI leadership and will be essential to the long-term effectiveness of the scheme.

In support of this scheme, this paper makes several further recommendations to the US government, including to engage industry to co-design the scheme; develop more targeted controls for the cloud; publish guidance on information sharing in the context of US antitrust laws to enable effective risk management by CSPs; and strong international advocacy and engagement to garner international buy-in and alignment.

8. In this paper, we are primarily addressing the governance of AI systems development. Questions about potential large-scale deployment, i.e. inference compute, are outside the scope of this particular discussion. However, the oversight of deployment compute might also be a future policy tool for regulating AI deployment (Appendix A in O’Brien, Ee, and Williams, *Deployment Corrections: An Incident Response Framework for Frontier AI Models*; Brundage et al., forthcoming).

1 Policy Context

Gaps have emerged in the US's AI regulatory architecture

The US's October 2022 export controls, further strengthened in 2023,⁹ are designed to limit the PRC's ability to access and develop semiconductors for highly capable artificial intelligence (AI) applications.¹⁰ Experts expect this measure to slow the PRC's development of advanced AI,¹¹ forming a cornerstone of US efforts to counter the proliferation of US-enabled AI technology to adversarial militaries. A subsequent executive order in August 2023 complements this, by inhibiting US investment in China's advanced technology sector.¹² Yet there is evidence of other avenues through which PRC entities can still access and develop high-risk advanced AI capabilities. It is not necessary for these entities to own the physical chips if they are accessible digitally. PRC actors can use the computing power of controlled US chips through the cloud, without any formal mechanism for oversight. There are clear national security grounds for addressing this gap. Regardless of whether management is achieved through a blanket ban (not recommended, see Box 1 for details) or active monitoring and more targeted controls (recommended), increased visibility of advanced AI cloud compute is an essential prerequisite to effective action.

Box 1: Controlling the PRC's access to chips through the cloud

As the PRC's access to advanced AI chips through the cloud seems to be at odds with current export controls, US lawmakers are already looking to take action. A Bill introduced into Congress in mid July 2023 proposes to 'prohibit support for the remote use or cloud use of integrated circuits' covered by export controls to prevent their use by actors in China or Macau.¹³ Yet a blanket ban on this access would likely lead to adverse outcomes.¹⁴ In particular, it risks diminishing US market share of cloud computing services and the US hardware used in these services, while the PRC focuses completely on its own sovereign capability or establishing access elsewhere.¹⁵

Unlike physical exports, cloud access allows for a precise and flexible mechanism to manage proliferation risks. Export controls on chips are blunt by necessity – once exported, chips cannot be retracted nor their end use controlled. So, while a PRC entity's use of a small number of high-capability chips would not in themselves raise strategic AI proliferation concerns,¹⁶ individual chips exported to the PRC could be amalgamated to bolster and advance in-country capability. The use of this capability is then beyond US awareness and control. In contrast, digital access to these chips only provides entities with point-in-time compute power, which can be restricted or shut off at any stage. Compute providers also retain insight into how much compute is being used per customer. Cloud access therefore allows for flexible digital controls that can be precisely targeted to capture the most resource-intensive compute uses, and be easily adapted as geopolitical conditions, capabilities, and risks change. As the compute provider already has compute usage information for its customers, this approach does not require privacy trade-offs to be effective. This allows for a targeted approach that directly addresses risk, while minimizing impact on US industry and technology leadership.

However, controlling compute via providers is not a perfect instrument and we want to be conscious of its limitations. We discuss them in the Appendix below.

9. Bureau of Industry and Security, *Commerce Strengthens Restrictions on Advanced Computing Semiconductors, Semiconductor Manufacturing Equipment, and Supercomputing Items to Countries of Concern.*

10. Bureau of Industry and Security, *Commerce Implements New Export Controls on Advanced Computing and Semiconductor Manufacturing Items to the People's Republic of China.*

11. Allen and Benson, "Clues to the U.S.-Dutch-Japanese Semiconductor Export Controls Deal Are Hiding in Plain Sight."

12. The White House, *Executive Order on Addressing United States Investments in Certain National Security Technologies and Products in Countries of Concern.*

In addition to closing export control gaps, greater oversight over AI compute can yield broader domestic and international benefits

In light of increasing concerns around AI misuse and risks to public safety, governments, industry,¹⁷ and researchers¹⁸ are calling for more oversight and regulation of AI. As posited by Senator Richard Blumenthal, Chair of the Senate Judiciary Subcommittee on Privacy, Technology, and the Law (the Subcommittee), ‘Congress failed to meet the moment on social media. Now we have the obligation to do it on AI before the threats and the risks become real.’¹⁹ Congress continues to engage industry on potential AI regulation. Seven leading US AI companies have agreed to voluntary ethical, security, and safety standards and called for greater public oversight, but these measures are not currently enforceable and will be unlikely to affect the behavior of broader industry players.²⁰ Microsoft’s Brad Smith has called for KYC-inspired techniques to be used to increase accountability in AI development.²¹ As a key enabler of AI development, compute is emerging as a key domestic and international governance instrument that can offer greater government oversight. In particular:

- It is a useful node to identify entities conducting cutting-edge AI development²² (i.e. those using the greatest amount of training compute), which would support the US government in identifying and engaging specific industry players on evaluating and managing risks.²³
- Greater oversight would also increase AI exposure and knowledge in the US government, enhancing its ability to effectively regulate this emerging technology.²⁴ It would provide the US government with a mechanism to verify the adherence of the leading AI companies’ implementation of their voluntary commitments.²⁵ In fact, the cybersecurity provisions in these commitments would also need to be carried out among compute providers, in addition to at the level of AI developers, in order to be effective. Oversight at the compute level would also allow for implementation of potential future regulations. For example, potential regulations on frontier AI systems might be triggered by such systems passing a predefined compute threshold, for which the compute provider can act as a natural checkpoint.
- It would also provide the US additional leverage to promote and/or enforce AI standards and regulations on an international scale. Mustafa Suleyman, CEO of AI start-up Inflection and co-founder of DeepMind, has advocated for the US to leverage its chokehold on the chip supply chain to shape global AI standards by limiting the consumption of cutting-edge US chips to entities that agree to adhere to minimum standards.²⁶

13. Rep. Jackson, *Closing Loopholes for the Overseas Use and Development of Artificial Intelligence Act*.

14. Dohmen et al., *Controlling Access to Compute via the Cloud*.

15. Fist, Heim, and Schneider, *Chinese Firms Are Evading Chip Controls*.

16. China’s use of a single, or small number of export-controlled chips is unlikely to be of concern to US interests, as it would not offer advantage over existing domestic Chinese AI capabilities.

17. Smith, *How do we best govern AI?*

18. Anderljung et al., *Frontier AI Regulation*.

19. Blumenthal, *Blumenthal (And AI Software) Delivers Opening Remarks at Senate Hearing on Oversight of Artificial Intelligence*.

20. Shear, Kang, and Sanger, “Pressured by Biden, A.I. Companies Agree to Guardrails on New Tools.”

21. Smith, *Developing and Deploying AI Responsibly: Elements of an Effective Legislative Framework to Regulate AI*.

22. Furthermore, these entities could also encompass AI agents themselves. Consider, for instance, an AI model exhibiting behaviors akin to a computer worm, actively seeking to acquire additional compute resources (e.g. for self-replication). Measures should be in place to ensure that such entities accessing compute are legitimate legal entities, thereby preventing rogue AI systems from taking unauthorized actions.

23. Whittlestone et al., “Response to the UK’s Future of Compute Review: A Missed Opportunity to Lead in Compute Governance.”

24. Anderljung et al., *Frontier AI Regulation*.

25. The White House, *FACT SHEET: Biden-Harris Administration Secures Voluntary Commitments from Leading Artificial Intelligence Companies to Manage the Risks Posed by AI*.

26. Waters, “US should use chip leadership to enforce AI standards, says Mustafa Suleyman | Financial Times.”

Cloud compute is an essential enabler of AI development

Compute refers to the computational power and infrastructure that is required to train and run AI models and systems. Training compute has grown by a factor of 55 million since 2010, outpacing hardware price performance.²⁷ The intensity of compute required for AI makes it impractical for most AI designers and operators to build and maintain their own data processing centers. This has led to compute emerging as a key node in the AI supply chain, with AI compute providers, most notably CSPs, renting out the hardware infrastructure, including access to advanced AI chips. It is in the US's interests that AI innovators continue to use cloud compute (rather than procuring and maintaining their own costly hardware capabilities) given that the majority of CSPs are in the US.²⁸ Allowing easy access to and use of superior US capabilities can also make AI innovators more invested in and reliant on leading US software stacks, like NVIDIA's, reducing the incentives for them to develop their own with less US oversight. Continuing to enable and support a strong cloud compute industry in the US will support US technology leadership more broadly. Notably, US companies are subject to US regulations, which serve as a useful channel for interventions to manage AI risks.

Increasing risks call for increasing vigilance

There is currently no obligation for US cloud providers to actively verify the identity of their customers before providing them with access to advanced AI compute. This is problematic in terms of US export controls. It is also of concern from a broader public interest perspective. As AI models grow in capability, so too do the risks to public safety. Foundation models, also known as general-purpose models (like ChatGPT) have already demonstrated significant capability advances. AI experts across sectors are warning of risks that may arise in future generations of general purpose models, particularly because it is hard to predict how dangerous capabilities might arise, and/or how they might be misused.²⁹ Researchers have coined the term 'frontier AI models', defined as 'highly capable foundation models that could exhibit dangerous capabilities'.³⁰ For example, frontier AI models could have the potential to conduct sophisticated, automated offensive cyber activities, enable non-experts to design and access new bioweapons, generate and proliferate persuasive deepfake content, or act in unexpected ways that cause harm.³¹ Like their forerunners ChatGPT, Bard, and other current foundation models, these future frontier AI models would need to be trained through significant use of computing power: typically the more computation, the greater the capability. Therefore, in considering options to prevent technology transfer to adversarial militaries, the US government should consider interventions that can also address broader safety and security needs.

Box 2: What do we mean by 'compute providers'?

In this context, we use the term 'compute provider' to refer to an entity providing access to computing power and infrastructure. In the majority of cases for AI development, these compute providers are CSPs, businesses that provide access through the cloud (including to foreign entities). Yet given the potential domestic safety implications of frontier AI models, taking a more expansive view of 'compute providers' may increase the longevity and impact of the proposed scheme. From a domestic perspective, it leaves the scheme open to the possibility of capturing providers of compute hardware and in-house compute capability (when it has the ability to go above the designated threshold). For example, it could be desirable that large technology companies using their AI compute internally also monitor and keep records for compliance with regulations in alignment with a KYC scheme. This is an area that would benefit from further research and analysis in collaboration with compute providers.

27. Sevilla et al., *Compute Trends Across Three Eras of Machine Learning*.

28. Taylor, *Data centers worldwide by country 2023*.

29. Anderljung et al., *Frontier AI Regulation*.

30. Anderljung et al.

31. Shevlane et al., *Model evaluation for extreme risks*.

2 A Know-Your-Customer scheme for compute providers

The US government should introduce a KYC scheme that ensures adequate monitoring for advanced AI cloud compute and allows the government to require compute providers to report high-risk entities and deny access to entities of concern.³² A KYC scheme requires businesses and organizations to verify the identity of their clients in order to provide them with access to particular goods and services. Introducing KYC requirements for entities accessing significant amounts of compute could help identify risks and enable further targeted restrictions where there is significant risk to national and global interests. Requiring compute providers to build greater awareness of the risks could encourage a safer AI industry aligned with public benefit.

It is important to note that this proposed KYC scheme for advanced AI cloud compute would not capture all AI models being developed or used by malicious actors. For example, there are already specific less-advanced models today, which do not require massive amounts of compute, that raise biochemical weapon development concerns³³ or enable more targeted malicious cyber activity. Setting the threshold to capture and monitor the compute of all AI models would not be beneficial, as it would capture too much information to be useful while imposing a significant imposition on industry. Such risks could instead be managed through other safeguards,³⁴ while the proposed in-depth KYC would focus on powerful foundation models trained on significant amounts of compute.

The history of the implementation of KYC in the financial sector could provide useful lessons for scheme design (Box 3).

Box 3: Learning from KYC in the financial sector

The most mature application of KYC can be seen in the financial sector, where it forms the cornerstone of Anti-Money Laundering (AML) and Counter-Terrorist Financing (CTF) obligations. In this context, KYC is implemented through domestic US legislation (particularly through the *Bank Secrecy Act* including as amended by the *USA PATRIOT Act*). This legislation creates obligations for financial institutions to:

- implement a customer identification program
- conduct risk assessments
- undertake enhanced due diligence for customers assessed as higher risk
- identify and verify a customer's beneficial owners
- conduct ongoing monitoring
- report suspicious activity to the US government.³⁵

These obligations are enforced by the *Financial Crimes Enforcement Network* (FinCEN) within the US Treasury, which acts as a regulator, investigator and financial intelligence unit.³⁶ In recent years, FinCEN has faced enforcement difficulties from the use of shell companies to hide illicit activity.³⁷ In response, FinCEN has implemented a rule establishing a beneficial ownership information reporting requirement, which will obligate companies registered in the US to provide information on the persons who control them, with a start date of January 2024.³⁸

32. Fist, Heim, and Schneider, *Chinese Firms Are Evading Chip Controls*.

33. Urbina et al., "Dual use of artificial-intelligence-powered drug discovery."

34. For example, through Government-Industry engagement on malicious cyber activity, intelligence monitoring of actors of concern etc.

34. Office of the Comptroller of the Currency, *Bank Secrecy Act (BSA)*; Financial Crimes Enforcement Network, *USA PATRIOT Act*.

35. Financial Crimes Enforcement Network, *USA PATRIOT Act*.

36. Hamilton and Condon, "U.S. Treasury Wants a Registry to Crack Down on Shell Companies."

Given the global nature of financial markets and transactions, KYC for the financial sector is well supported by international cooperation. In particular, the [Financial Action Task Force \(FATF\)](#) is the key intergovernmental organization that promotes global AML/CTF standards.³⁹ The FATF was established by the Group of 7 (G7) in 1989.⁴⁰ The FATF standards include 40 recommendations – including on KYC requirements – that form a framework for member nations to implement through their own domestic legislation.⁴¹ The FATF also publishes lists of jurisdictions that fail to effectively implement safeguards, and calls for members to apply enhanced due diligence and countermeasures to entities from these countries to protect the international financial system.⁴² This ensures a consistent approach that supports efforts to counter money laundering, terrorism financing, and the proliferation of weapons of mass destruction.⁴³ The financial sector’s KYC scheme is also supported by a well-established intelligence architecture specifically for AML/CTF threats. The [Egmont Group of Financial Intelligence Units](#) brings together 166 Financial Intelligence Units globally to share intelligence and expertise to counter money laundering and terrorism financing threats.⁴⁴

The cost of compliance and enforcement of AML/CTF is significant. The 2024 Federal Budget allocated \$229 million for FinCEN, including funding for 350 staff members, an increase of \$39 million from 2023.⁴⁵ In 2022, the cost of financial crime compliance efforts across financial institutions is estimated to be \$40.7 billion in the US and \$274.1 billion globally.⁴⁶

Implementation: obstacles and adjustments

The financial sector presents a case study of situations in which non-compliance with obligations persisted until significant penalties were applied. For the first decade of the Bank Secrecy Act, from 1972 to 1985, regulators did not enforce reporting requirements, resulting in low compliance from financial institutions.⁴⁷ However, a 1985 \$500,000 penalty issued to the Bank of Boston led to a sharp increase in reporting, as well as more evasive behavior from customers.⁴⁸ More recently, Congress has taken further action to increase enforcement. The Anti-Money Laundering Whistleblower Improvement Act, signed into law in December 2022, increases reporting incentives with greater financial rewards for successful tips.⁴⁹

KYC in the financial sector also demonstrates implementation risks, including the use of “structuring” to evade publicly set thresholds.⁵⁰ In response to obligations for banks to report transactions exceeding \$10,000 in any one day, entities and individuals started to intentionally break up transactions across bank accounts and/or days to avoid scrutiny.⁵¹ Amendments made through the *2001 PATRIOT Act* have sought to address this by making structuring a criminal offense.

37. Financial Crimes Enforcement Network, *What We Do*.

40. Financial Action Task Force, *What we do*.

41. International Monetary Fund, *Anti-Money Laundering/Combating the Financing of Terrorism*.

42. Financial Action Task Force, *FATF Recommendations*.

43. Financial Action Task Force, *High-Risk Jurisdictions subject to a Call for Action*.

44. Lattin, Hennessy, and Newton, *Australia: Major AML/CTF regulatory reform is back on the cards*.

45. Egmont Group, *About the Egmont Group*.

46. Office of Management and Budget, *Budget of the U.S. Government - Fiscal Year 2024*.

47. LexisNexis Risk Solutions, *True Cost Financial Crime Compliance 2022*.

47. Linn, “Redefining the Bank Secrecy Act: Currency Reporting and the Crime of Structuring.”

48. Linn.

49. Sen. Grassley, *A bill to provide for certain whistleblower incentives and protections*.

50. Linn, “Redefining the Bank Secrecy Act: Currency Reporting and the Crime of Structuring.”

51. Federal Financial Institutions Examination Council, *BSA/AML Manual - Appendix G*.

Developing a KYC scheme for advanced AI cloud compute

Informed by the model established by the financial sector, the development of a new KYC scheme will require:

1. defining a threshold of AI compute at which the scheme would apply
2. introducing requirements and guidance for compute providers above that threshold, including reporting to government entities that match specified ‘high-risk’ profiles, and adhering to rules
3. establishing government capacity for engagement, regulation, and enforcement
4. engaging and cooperating with international partners
5. establishing a process for evaluation and updates to the scheme.

The introduction of a KYC scheme for advanced AI cloud compute would lay the groundwork for understanding the threat, including any substantial access attempts by People’s Liberation Army (PLA)-linked entities, and enable more targeted restrictions to prevent entities of concern from access through the cloud. Importantly, it would also increase government’s ability to see trends and emerging risks and point AI policy makers towards companies operating at the cutting-edge to allow for better engagement in risk management.

2.1 Compute is indicative of AI capabilities and KYC thresholds should be set accordingly

KYC obligations should apply at and beyond a threshold of advanced AI compute that captures the most critical AI risks, while minimizing regulatory impost on industry.⁵² One can quantify the computational performance of hardware in terms of a unit of floating point operations per second (FLOP/s). The resulting accumulation of computing power going into developing or deploying an AI model can be measured in the quantity of FLOP.⁵³ This allows for a defined threshold. Government could work closely with AI experts and compute providers to ensure that the threshold is set at a level that captures frontier AI models. Because such models are most likely to emerge at the largest compute scales, the initial threshold could be set at the level of FLOP used to train current foundational models, like GPT-4⁵⁴ or Claude 2,⁵⁵ thereby also capturing models trained on even more compute. This would also ensure that the burden of compliance with the KYC scheme only falls on operators able to absorb it; GPT-4, for example, is estimated to have cost \$50 million to train.⁵⁶ This would only capture a handful of models at the time of writing. With training requirements continuing to double every six-to-12 months, we can expect that an increasing number of cloud-trained AI model developers will be subject to KYC.⁵⁷

Improvements in algorithmic efficiency over time may result in increased compute efficiency – requiring less compute to achieve the same training results, and potentially necessitating a lower threshold to capture models of concern.⁵⁸ Conversely, advances in regulation or society’s ability to manage AI impacts may decrease the risks associated with advanced AI models, thereby making a higher threshold appropriate.⁵⁹ The threshold should therefore be dynamic and subject to regular review by government and industry. It should be responsive to metrics broader than computing power that influence AI capability and society’s resilience to AI risks. This will also allow for continued refinement as processes mature and the ability to adapt to changing geostrategic conditions and risks.

52. Here we focus on compute used for the development of advanced AI systems, and potential large scale deployment. We do not answer the question of inference compute.

53. Heim, *FLOP for Quantity, FLOP/s for Performance*.

54. McAleese, *Retrospective on ‘GPT-4 Predictions’ After the Release of GPT-4*.

55. Wiggers, Coldewey, and Singh, “Anthropic’s \$5B, 4-year plan to take on OpenAI.”

56. Epoch, *Key trends and figures in Machine Learning*.

57. Sevilla et al., *Compute Trends Across Three Eras of Machine Learning*.

58. Anderljung et al., *Frontier AI Regulation*; Tucker, Anderljung, and Dafoe, “Social and Governance Implications of Improved Data Efficiency.”

59. Anderljung et al., *Frontier AI Regulation*; Tucker, Anderljung, and Dafoe, “Social and Governance Implications of Improved Data Efficiency.”

Applying a specified FLOP threshold offers a feasible path to implementation and does not require cloud providers to access the data or confidential information of their customers. Cloud access to chips is billed by the hour, so the accumulated total FLOP is easily identifiable by the compute provider. The compute provider could then implement KYC checks and enhanced due diligence for any projects seeking to cross that threshold. In many cases, the total amount of compute procured will be specified at the time of entering into contract, but there may also be cases where additional compute is purchased over time, to the point at which a specific vendor crosses the threshold. Compute providers should therefore continuously monitor compute use, and ensure that entities approaching the threshold are funneled into the KYC process before that point is reached.

Regulatory impost is likely to be low, with few stakeholders affected

Given the proposed threshold, only a small number of customers for a small number of US compute providers would be affected. Providers that offer, or use in-house, the most advanced computing power also tend to be the most resourced, such as Microsoft Azure, Google Cloud, NVIDIA, Amazon Web Services (AWS), and Oracle Cloud Infrastructure.⁶⁰ These factors could help mitigate the risk of an overly costly, burdensome regime (criticisms often directed at KYC in the financial sector). In addition to having the bandwidth to implement KYC, these companies may already be working to control significant AI risks, given their public commitments to ethical and/or responsible AI.⁶¹ Microsoft has specifically called for the implementation of a KYC program in their report *Governing AI: A Blueprint for the Future*,⁶² and Amazon, Anthropic, Google, Inflection, Meta, Microsoft, OpenAI and NVIDIA, among others, have committed to further safeguards against risky AI.⁶³

2.2 Requirements on compute providers – due diligence that identifies risk and implements controls

For AI cloud compute services that possess sufficient computational power, i.e., type and number of AI chips, to surpass the threshold, the scheme would require compute providers to identify and verify the entity and its beneficial owners, and maintain appropriate records. The government could also define ‘high-risk’ profiles, and require compute providers to report such cases, in order to monitor for emerging risks and to inform future controls. The KYC scheme should also be used as a key mechanism to ensure the implementation of rules.

While the KYC scheme provides the mechanism for oversight of advanced AI compute, rules governing US companies in their provision of such compute can be implemented through complementary existing authorities. For example, the US government could update the rules affecting the Export Administration Regulations to prevent the provision of above-threshold compute to entities on the Entity List without a license.^{64 65}

Beyond export controls, the KYC scheme will allow for the implementation of broader regulations on AI. For example, should the government choose to mandate the voluntary commitments made by leading AI companies – including, for example, having implemented safe-development practices and cybersecurity standards – the KYC checks could also ensure that those accessing advanced AI compute are in compliance before permitting access. In this way, the KYC scheme forms a flexible foundation to ensure oversight of an increasingly sensitive set of technologies.

60. NVIDIA Corporation, *NVIDIA Hopper GPUs Expand Reach as Demand for AI Grows*.

61. Croak, *Google Research, 2022 & beyond*.

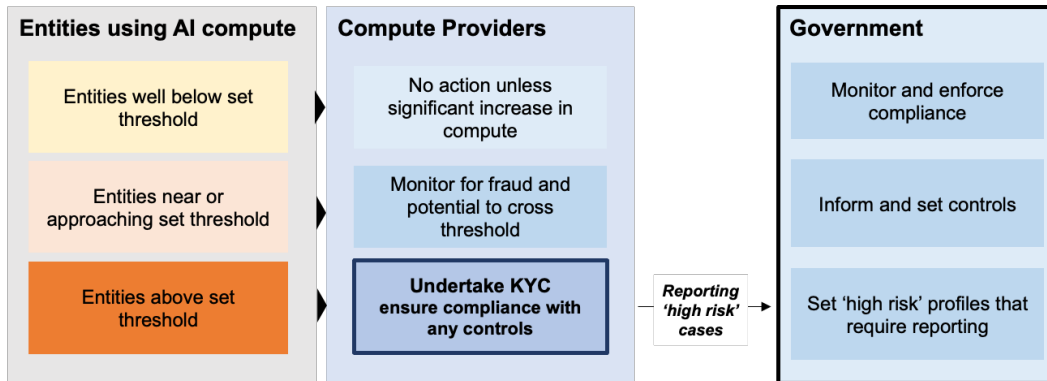
62. Smith, *How do we best govern AI?*

63. Shear, Kang, and Sanger, “Pressured by Biden, A.I. Companies Agree to Guardrails on New Tools.”

64. Bureau of Industry and Security, *Commerce Implements New Export Controls on Advanced Computing and Semiconductor Manufacturing Items to the People’s Republic of China*.

65. This paper does not propose expanding export controls to prevent entities beyond the Entity List from accessing cloud compute. Instead, we recommend KYC is used to develop a more nuanced understanding of the risks of PRC use of US compute. Given the flexible, digital controls it enables, it can be quickly applied once risks are identified.

Figure 1: Mechanisms of KYC Scheme for compute providers



While we can seek to adapt the model established by the financial sector to the context of compute providers as a starting point (Box 4), consultation and stress-testing with industry stakeholders will be key to developing a workable scheme.

Box 4: Possible requirements for compute providers

Building on requirements established in the financial sector, and requiring further consultation with compute providers, KYC requirements for advanced AI cloud compute might include:

- Identifying the entity, including:
 - company name
 - proof of incorporation
 - legal form and status
 - address of registered office
 - list of directors and senior management
 - list of board members
 - basic regulating powers (e.g. memorandum and articles of association)
 - unique identifier (e.g. tax identification number or equivalent, where applicable).
- Identifying key personnel and all beneficial owners,⁶⁶ including:
 - full name, including any aliases
 - date and place of birth
 - nationality
 - home address
 - government issued identification number.
- Verifying information provided, including through checking domestic and international government registries.
- Providing a high-level overview of the purpose for the use of compute power, and where relevant, investigating details of sublessors of the compute.

66. As defined in FinCEN’s final rule implementing beneficial ownership information reporting requirements, a beneficial owner is ‘any individual who, directly or indirectly, either (1) exercises substantial control over a reporting company, or (2) owns or controls at least 25 percent of the ownership interests of a reporting company. Financial Crimes Enforcement Network, *Beneficial Ownership Information Reporting Rule Fact Sheet* | [FinCEN.gov](https://www.fincen.gov)

- Conducting ongoing high-level usage monitoring to identify changes or emerging characteristics that could change the assessment:
 - changes in contracts that bring entities into the KYC threshold or increase in procured cloud compute that exceeds the expected scope of the stated project
 - use of compute different from what would be expected from the stated purpose (e.g. high-level usage patterns that may indicate AI training rather than AI deployment).
- Sharing information with other compute providers to identify and mitigate evasion attempts while preserving privacy.
- Assessing whether an entity would match a defined ‘high-risk’ profile and reporting these cases to the government. Factors that could be considered include:
 - the US specially designated nationals and blocked persons list;⁶⁷
 - the US Entity List.⁶⁸
 - other entities restricted from accessing advanced AI chips under export controls.⁶⁹
 - strong links to a country of concern, which may be informed by factors including that:
 - * the entity or beneficial owner/s are based in a country of concern
 - * there is evidence that the entity or beneficial owner/s have significant ties to a country of concern
 - * the entity’s board has significant ties to a country of concern
 - * director/s or senior management are currently affiliated with research institutions from a country of concern
 - * IP addresses originate in a country of concern
 - * evidence of large amounts of data going to/from a country of concern.
 - the source of the entity’s capital or funding is not clear (which could potentially lead to requiring the entity to clarify their source or lose compute access).
 - entities from countries on the [FATF high-risk jurisdiction list](#).⁷⁰
 - requests for significantly more compute power than is typically used to develop current cutting-edge models.
- Using KYC to enforce established rules, which may include:
 - updated Export Administration Regulations that restrict companies providing above-threshold compute to entities on the Entity List
 - seeking confirmation of the entity’s implementation of safe-development practices, including cybersecurity standards (if the voluntary commitments agreed upon between industry and the White House become mandatory).⁷¹
- Maintaining records on the provision or denial of above-threshold compute to aid in investigations or demonstrate compliance, when needed.

2.2.1 Technical feasibility

It is likely that information pertaining to an entity’s identity and beneficial owners will be readily attainable, given that entities would have such information on hand for their financial institutions.

67. Office of Foreign Assets Control, *Specially Designated Nationals And Blocked Persons List (SDN) Human Readable Lists*.

68. Bureau of Industry and Security, *Export Administration Regulations: Supplement No. 4 to Part 744 - Entity List*.

69. Bureau of Industry and Security, *Commerce Implements New Export Controls on Advanced Computing and Semiconductor Manufacturing Items to the People’s Republic of China*.

70. As at August 2023, these are DPRK, Iran and Myanmar. Financial Action Task Force, *High-Risk Jurisdictions subject to a Call for Action*.

71. The White House, *FACT SHEET: Biden-Harris Administration Secures Voluntary Commitments from Leading Artificial Intelligence Companies to Manage the Risks Posed by AI*.

Similarly, checking information against government registries and lists is also feasible, and can draw on existing compliance expertise from the financial sector.

However, while compute providers can collect statements from customers on their planned use of cloud compute, this can be difficult to verify in practice. CSPs often take pride in their ability to offer privacy to their customers, with some providers designing ‘confidential compute’ offerings to make it technically impossible for compute providers to look in at the customer’s data.⁷² It is not always clear what compute is being used for, with both the training of foundational models and using AI models for inference requiring intensive compute power.⁷³ Given the sensitive proprietary information and data involved in cutting-edge AI models, requirements that significantly affect privacy will likely generate significant industry backlash and diminish US industry power. The dispute between the FBI and Apple in 2016 is evidence of the tension between the US government’s security priorities and privacy principles held by the technology sector and general public.⁷⁴ Further research and collaboration with industry is warranted to identify mechanisms that allow for more effective verification in a way that preserves privacy. A helpful starting point could be focusing on the types of clusters used and how the GPUs are networked, as well as chip hours, which tend to differ according to purpose. This information is known to the compute provider, as these requirements would generally be specified as part of a customer order. Thus, the implementation of the KYC scheme would not require the compute provider to access the underlying code, data, or any system level insights, maintaining appropriate privacy standards.

2.2.2 Mitigating attempts to evade detection

As seen in the case of KYC in the financial sector, malicious actors may seek to evade detection by engaging in “structuring”. In the case of AI, that structuring could involve finding ways to deconstruct compute-intensive projects into smaller, discrete sub-projects that fall below the reporting threshold. Compute providers would be responsible for undertaking their own fraud prevention to ensure that they identify a single entity acting as multiple customers, a measure that is likely already present in existing practices to prevent customers from bypassing terms and conditions. The government would need to work closely with compute providers and the AI industry to monitor how AI development changes in response to the introduction of such schemes and develop responses.

An information-sharing mechanism could be a key tool that compute providers could use to work together to identify actors purchasing disaggregated compute from different companies. However, information-sharing between competitors may be restricted by US Antitrust Laws.⁷⁵ Close engagement with legal and regulatory experts will be required to carefully design an appropriate scheme, and/or statutory protection could be achieved through legislation. Previous case studies offer some hope: statements from the Department of Justice and Federal Trade Commission noted that sharing information regarding cybersecurity threats was appropriate and a well designed cyber threat sharing scheme would not be likely to raise antitrust concerns.⁷⁶ Privacy preserving techniques, such as Private Set Intersection computation,⁷⁷ can also be employed effectively in support of information sharing.

Another detection evasion risk could arise from the use of shell companies to obscure an entity’s ultimate owners. The beneficial ownership information reporting requirement, commencing January 2024 in the US and is currently being adopted more broadly by FATF members, could help decrease this risk by requiring companies to disclose information on the people who ultimately own them.⁷⁸ However, given the strategic and economic importance of advanced AI, it is likely that [malicious] actors will continue to try to obfuscate their identities. Given the relatively small numbers of entities

72. NVIDIA Corporation, *NVIDIA Confidential Computing*.

73. L. Heim, *Compute - Transformative AI and Compute*.

74. Kharpal, *Apple vs FBI*.

75. US Department of Justice, *The Antitrust Laws*.

76. Federal Trade Commission, *FTC, DOJ Issue Antitrust Policy Statement on Sharing Cybersecurity Information*.

77. NIST Computer Security Research Center, *CSRC Presentation*.

78. Financial Crimes Enforcement Network, *FinCEN Issues Final Rule for Beneficial Ownership Reporting to Support Law Enforcement Efforts, Counter Illicit Finance, and Increase Transparency*.

seeking to access significant amounts of advanced AI compute in the near term, a government enforcement team could consider undertaking their own investigations and spot checks on companies.

2.2.3 Enforcing the KYC Scheme

A key challenge for the scheme is how regulators can enforce compliance with KYC requirements amongst compute providers. For example, how would the regulator identify a compute provider's failure to effectively implement the scheme, and/or deliberate non-compliance? Information and expertise asymmetry between technologically informed compute providers and nascent government regulation capability will add to this challenge. Microsoft's advocacy for the introduction of KYC means there is some industry goodwill to leverage, but the government will also have to incorporate external expertise to guard against regulatory capture. As a starting point, enlisting support from jurisdictions with experience in AI regulation, such as the EU, as well as engaging AI researchers, could help strengthen enforcement abilities. The administration of this scheme would build a deeper understanding of AI in government, and enable more effective AI policy more broadly.

Unlike in the parallel financial-sector crime of money laundering, the AI sector does not have established entities and resources for identifying and policing cloud compute access. However, following the model of the financial sector, government could consider establishing a whistleblower scheme with a financial reward to incentivize employees to report suspected violations.

The scheme should be established to allow for flexible enforcement tools, including the ability to direct a compute provider to pause or cease providing compute to any entity found to be in violation of the scheme. Enforcement should also be paired with the effective use of the Bureau of Industry and Security's (BIS) Export Administration Regulations. Where cloud compute is identified as supporting military, intelligence, or security end uses that conflict with US interests, BIS could then introduce export controls to prevent US compute providers from providing this service.⁷⁹ The KYC scheme should also be enforced through the application of penalties. To avoid a culture of non-compliance like that seen in the early days of the Banking Secrecy Act, regulators should demonstrate a willingness to issue non-trivial penalties for deliberate non-compliance, in addition to playing a regulatory coaching role. Depending on how the threat context evolves, there may also be value in dedicating government resources to actively seek out and investigate potential violations.⁸⁰

2.3 Establishing government capacity for engagement, regulation, and enforcement

To co-design, implement, administer, update, and enforce a KYC scheme for advanced AI cloud compute, the US government should establish a new unit in the Department of Commerce that is responsible for AI regulatory policy. This unit should collaborate with and leverage expertise from other relevant entities including the BIS, the National Institute of Standards and Technology, FinCEN and AI industry and researchers. It should also work closely with counterparts at the Department of Defense, to ensure that national security needs are met, as well as the Department of State, to help promulgate the scheme internationally.

To keep the scheme up-to-date and geared towards key risks, the introduction of a KYC scheme should be accompanied by a process for regular evaluation and iteration. Updates should be informed by consultation with relevant agencies, stakeholder industries and international partners. The US National AI Advisory Council (NAIAC), established in 2022, could play a key role in providing cross-sectoral advice in this process. While the NAIAC has a broad remit that includes workforce, ethical, and leadership issues, it has a key role in ensuring ongoing US AI leadership, coordination across civil and security agencies, and matters relating to oversight of AI systems.⁸¹ To ensure that technical expertise continues to inform updates, the NAIAC could establish a working group on AI compute controls that brings together private, public, and academic sector expertise.

79. Dohmen et al., *Controlling Access to Compute via the Cloud*.

80. This could involve scouring the darkweb for evidence of undisclosed/underhand resale of substantial AI compute power; and/or intelligence gathering and analysis, depending on the nature of the identified risks.

81. *National Artificial Intelligence Advisory Committee Charter*.

2.4 Engaging and cooperating with international partners

While US dominance of cloud compute will render even domestic KYC globally significant, international support for the scheme will help maximize its effectiveness, particularly in the longer term. As the leader in cloud service provision, the US is uniquely positioned to shape global regulations and standards for advanced AI cloud compute. There are an estimated 335 to 1325 data centers globally with a capacity of above 10MW – enough to enable a large AI training run – with the majority owned by US technology leaders.⁸² However, only a minority of them actually host the AI-specific compute and the exact numbers are unknown; KYC could assist in developing a clearer picture. Nevertheless, unilateral US action will be limited in shaping the market long term. Operating alone could give rise to adverse outcomes, diminishing the attractiveness of US compute providers and pushing those with greater privacy premiums to lower regulatory environments. Over time, this could degrade US leadership in compute and AI.

The US should therefore work with key international partners on an aligned KYC scheme for advanced AI cloud compute. While nations' and companies' adherence to the scheme could ultimately be enforced via the threat of withholding US chip hardware exports, such a scheme will be most effective if supported by goodwill and shared purpose. The US should therefore engage first diplomatically, with a particular focus on countries with significant data center architecture. These would include European countries, which are estimated to host approximately 25 percent of all data centers globally,⁸³ and Japan with its world-leading supercomputer capabilities.⁸⁴ Engagement with a broader set of likeminded countries will also help to add momentum to the international initiative. For information on these countries' positions on AI regulation, refer to Box 5.

In addition to direct outreach on the shared risks, the US should leverage partnerships with cross-border companies that can internally advocate for a KYC regime. For example, because Microsoft has already proposed implementing a KYC model for advanced AI,⁸⁵ it could help engage partners like the UK that are seeking to prioritize innovation and light-touch regulation.

Following engagement with key partners, the US should work to establish longer-term international architecture. Like the FATF in the financial sector, an intergovernmental organization for AI compute controls could help share risk information and align standards and best practices. Given a focus on tactical and implementation matters, this organization would be separate and complementary to existing international AI risk groupings, like the OECD AI Policy Observatory.⁸⁶

Box 5: Current positions on AI regulation and implications for US KYC engagement

Europe

The European Union's (EU) approaches to AI regulation will be shaped by the EU AI Act. On 14 June 2023, the draft text of the law was agreed upon between the European Parliament and the EU's executive branch, with negotiations beginning with EU countries on the final form of the law.⁸⁷ Amongst other measures, the draft law prohibits some specific AI uses (like real-time facial recognition), introduces safety requirements for high-risk use cases, and imposes risk assessments for foundation models.⁸⁸ The draft law does not currently introduce specific risk requirements based on level of compute used.⁸⁹ Given the extensive negotiation and law-making process involved in the EU AI Act, the EU and its members may be hesitant to enter further discussions on additional restrictions. Yet the passage of the AI Act would signify a focus on safety and security that could be further enhanced through cloud KYC. Given the significant regulatory burden of the EU AI Act, emphasizing the minimal

82. Pilz and Heim, *Compute at Scale*.

83. Pilz and Heim.

84. *June 2022 - Top 500: the List*.

85. Smith, *How do we best govern AI?*.

86. Wyckoff, *GlobalPolicy.AI unites the work of eight international organisations on artificial intelligence - OECD.AI*.

compliance costs of KYC will be key. The EU member state of the Netherlands has also shown a willingness to align with US efforts to curb dangerous AI proliferation to China.⁹⁰

Japan

Like the Netherlands, Japan has already engaged closely with the US on efforts to curb China's access to semiconductor technologies, which impact AI development.⁹¹ However, Japan's AI policies to date have focused on maximizing AI's positive impact, rather than concentrating on risks. Japan considers further regulation not yet necessary.⁹² Japan may therefore be more motivated by the national security benefits of KYC, rather than broader public safety concerns.

UK

The UK's 2023 policy paper *A pro-innovation approach to AI regulation* cautions against 'placing unnecessary regulatory burdens on those deploying AI,' and instead focuses on the context in which AI is deployed.⁹³ Nevertheless, the UK is actively considering the role of measuring compute in the governance of foundation models,⁹⁴ and is a close strategic partner of the US. Given its focus on making innovation easier and strengthening its leadership in AI, the UK will be particularly sensitive to regulatory impacts of a KYC scheme.

Canada

On 16 June 2022, Canada introduced the Artificial Intelligence and Data Act into Parliament.⁹⁵ The Act seeks to ensure that high impact AI systems meet safety and human rights standards, to enable enforcement and policy to keep up with technology developments, and to prohibit reckless and malicious uses of AI.⁹⁶ One of the principles for managing high-risk systems is human oversight and monitoring, including in how systems are designed and trained.⁹⁷ KYC could be used to support this effort.

Australia

Given its relatively small market size, Australia is aware that its 'ability to take advantage of AI supplied globally and support the growth of AI in Australia will be impacted by the extent to which Australia's responses are consistent with responses overseas.'⁹⁸ From May to July 2023, the Australian government undertook a public consultation process on how the government could support safe and responsible AI.

87. European Parliament, "EU AI Act."

88. European Parliament.

89. Perrigo and Gordon, "E.U. Closer to Passing World's Most Comprehensive AI Law | Time."

90. Kharpal, "Netherlands, home to a critical chip firm, follows U.S. with export curbs on semiconductor tools."

91. Cash and Bernard, "China urges Japan to halt export restrictions on chips | Reuters."

92. Habuka, *Japan's Approach to AI Regulation and Its Impact on the 2023 G7 Presidency*.

93. UK Office for Artificial Intelligence, *Policy paper: A pro-innovation approach to AI regulation*.

94. UK Office for Artificial Intelligence.

95. Minister of Innovation, Science and Industry, *An Act to enact the Consumer Privacy Protection Act, the Personal Information and Data Protection Tribunal Act and the Artificial Intelligence and Data Act and to make consequential and related amendments to other Acts*.

96. Government of Canada, *The Artificial Intelligence and Data Act (AIDA) – Companion document*.

97. Government of Canada.

98. Australian Government Department of Industry Science and Resources, *Safe and responsible AI in Australia*.

3 Recommendations

3.1 The US Department of Commerce should work with compute providers, industry stakeholders and AI researchers to develop a domestic KYC scheme for advanced AI cloud compute.

This should include:

- defining the threshold of AI compute at which the scheme would apply that captures frontier AI models and risks of bolstering an adversarial military’s capability.
- introducing requirements for compute providers above that threshold to verify customers’ identities, keep records, report to government any entities that match government-specified ‘high-risk’ profiles, and implement controls.
- establishing a government unit for implementation, monitoring, and enforcement.
- a clear process for evaluation and updates to the scheme.

3.2 The Department of Commerce should update rules affecting the Export Administration Regulations to explicitly prohibit the provision of above-threshold compute to entities on the Entity List without a license.

This would help prevent US resources from being used by entities acting contrary to US national security interests, while still enabling US industry leadership. The KYC scheme would provide the mechanism for US companies to effectively implement these controls.

3.3 The Department of Commerce should implement this scheme under the authority of a Presidential Executive Order, potentially leveraging existing efforts.

President Trump’s 2021 Executive Order *Taking Additional Steps to Address the National Emergency with Respect to Significant Malicious Cyber-Enabled Activities* charged the Department of Commerce with introducing an obligation for providers of US IaaS to verify and record the identity of persons applying for accounts in order to combat malicious cyber activity.¹⁰⁰ More recently, the 2023 National Cybersecurity Strategy commits the Administration to implementing this Executive Order.¹⁰¹ While the scope of this measure is broader – applying to all IaaS – and its exact form unclear, there is an opportunity to combine these schemes to create a tiered approach. Light touch KYC could be implemented across the board, with comprehensive due diligence obligations applied to the frontier model and strategic risk threshold. Should the US Administration consider that this existing authority is insufficient, the President should consider issuing a new Executive Order explicitly granting authority for the KYC Scheme. This additional authority would likely be needed to broaden the scheme to capture non-CSP entities, such as compute hardware providers and in-house use of compute for AI development.

3.4 The Department of Commerce should work with the Department of Justice and the Federal Trade Commission to publish guidance on US Antitrust Laws in this space.

This will help inform and enable a privacy-preserving information-sharing mechanism to identify and address evasion efforts, while ensuring that competition is not reduced and consumer protections are upheld.

100. The White House, *Executive Order on Taking Additional Steps to Address the National Emergency with Respect to Significant Malicious Cyber-Enabled Activities*.

101. The White House, *National Cybersecurity Strategy*.

3.5 The Department of State should work closely with the Department of Commerce to build international support for an advanced AI cloud compute KYC scheme.

This should include partnering with entities with significant data center capability and developing new international architecture to support the scheme.

4 Conclusion

Amidst calls for more active management of AI, a KYC scheme will address a gap in export controls, and provide the US government with the groundwork for greater oversight and control over risky AI developments. While the scheme will not address all AI risks, it will allow for a more precise and flexible approach to controlling risks from frontier AI models and unwanted AI proliferation. It will also increase government visibility over AI and allow for more proactive management. When scaled internationally, this scheme has the potential to support global AI governance architecture. Essential to the scheme's success is genuine co-design with industry and experts. This partnership will be keen to minimize harm while maximizing the benefits of AI.

Appendix

Practical Considerations for Implementing KYC based on Compute Threshold

While compute serves as a crucial instrument in the proposed Know Your Customer (KYC) scheme, it is important to acknowledge its limitations and the associated open questions that might influence its effective implementation.

First, the total amount of compute utilized across various models and tasks is inherently dynamic and not pre-defined. The complete aggregate compute, accumulating the computational power that a system consumes over time, ultimately results in a total FLOP count, becoming evident as it is being used. This dynamic accumulation implies that identifying which customer surpasses the threshold preemptively is challenging.¹⁰²

However, the practical scarcity of GPUs necessitates advance requests for access, especially considering the substantial number required to meet the discussed thresholds (thousands of GPUs). Developers also prefer a large, interconnected cluster of GPUs rather than disparate units distributed across different clusters or data centers, as this facilitates high-bandwidth connections essential for AI development and deployment. Moreover, the level of compute under consideration, amounting to two-digit dollar millions, usually requires negotiations with sales teams, rather than on-demand purchases (where CSPs might already undertake something similar to a KYC to make sure that they are being paid). Therefore, we suggest that, practically speaking, CSPs are already aware of large compute orders and can then enact the required KYC.

In scenarios where exact compute needs are indeterminate, continuous monitoring of chip-hour accumulation is important. Warnings should be set at varying levels, such as 50% and 80% of the threshold, to maintain awareness of the customer when approaching limits. Upon meeting the threshold, KYC procedures should be instigated, and if not previously completed, access should be terminated.

Given the inherent characteristics of computational requirements in AI, we anticipate a bimodal distribution where most actors either utilize minimal amounts below the threshold or significantly larger quantities. In most instances, users will either surpass the threshold from the onset or they won't come remotely close to reaching it. This expectation is attributed to the order of magnitude differences in AI compute usage for AI systems, the connected monetary costs, and the resulting small number of frontier AI developers. Consequently, the application of an indicator value to establish a lower boundary, or warning level, proves to be particularly effective in this context. It ensures that the systems predominantly captured are those that either exceed or are in close proximity to the set threshold.

Second, the limitations in discerning specific insights about user (AI) activities, such as the phase of the AI lifecycle or model architecture, are important considerations for the implementation of this scheme. It's critical to leverage instruments that preserve the privacy and integrity of user workloads. Despite these limitations, we maintain optimism that the available tools and metrics are sufficiently indicative and could be expanded by instigating further inquiries and assurances from the customer without compromising their privacy.

Compute providers can easily access data related to total compute usage, such as the number of chip hours and the type of chip, as they are required for billing. However, the intrinsic privacy and confidentiality clauses of cloud business prohibit providers from gaining insights into the precise activities of the customer at the system level. This restriction necessitates reliance on high-level, abstract metrics, which are the only permissible indicators available for monitoring.

Our approach leverages available high-level metrics, which serve as preliminary indicators prompting further checks, without delving into more detailed aspects of user workloads. Potential concepts like

¹⁰². Furthermore, it's an oversimplification to assume that all the rented compute contributes solely to the system's training. The development process usually involves iterative refinements, so that the total compute usage could be two to four times the actual training compute.

proof of training or the yet-to-be-explored proof of inference could allow customers to validate their compute usage without requiring providers to access more information than total compute usage.

In future work, we plan to investigate how various cluster-level metrics, extending beyond chip-hours, can be leveraged by cloud providers to facilitate enhanced oversight while preserving user privacy. For instance, exploring metrics like network traffic patterns could be instrumental in differentiating between AI training and inference processes. We also urge the wider research community to investigate these issues.

In this paper, we are primarily addressing the governance of AI systems development. Questions about potential large-scale deployment, i.e. inference compute, are outside the scope of this particular discussion. However, the oversight of deployment compute might also be a future policy tool for regulating AI deployment (Appendix A of O'Brien, Ee, and Williams, *Deployment Corrections: An Incident Response Framework for Frontier AI Models*; Brundage et al., forthcoming).

The limitations in acquiring detailed insights necessitate a balanced approach, focusing on high-level indications without compromising user privacy. The available metrics, which extend beyond type of chip and chip-hours, are considered adequate for initial insights and prompt actions. Further exploration of these topics is necessary, and we advocate for continued research to refine and advance the methodologies for achieving effective oversight while maintaining user trust and privacy.

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