



05 November 2025

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## DISCUSSION PAPER

# Asset Tokenisation

Comments to be received by 9 January 2026



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## I. INTRODUCTION

1. Asset tokenisation, which represents a paradigm-shifting approach within blockchain-based digital asset representation, is gaining significant attention globally from prominent international organisations such as the Organization for Economic Cooperation and Development (OECD)<sup>1234</sup>, the International Organization of Securities Commissions (IOSCO)<sup>5</sup>, the Bank for International Settlements (BIS)<sup>6</sup>, the Financial Stability Board (FSB)<sup>7</sup>, and the International Swaps and Derivatives Association (ISDA)<sup>8</sup>. The breadth of these organisations underscores the need to understand the far-reaching implications of tokenisation, including its risks and opportunities.
2. Bermuda's digital asset framework already provides the legal basis for tokenisation by classifying it as a regulated digital asset business activity<sup>9</sup>, establishing a foundation for this innovative development. This Discussion Paper (DP) seeks stakeholder input on the opportunities, challenges and potential regulatory considerations related to asset tokenisation in Bermuda. Specifically, it aims to explore whether tailored regulatory measures or guidance are necessary for entities engaged in tokenisation activities, and to assess whether the existing principles-based regime requires further enhancements to adequately address the complexities and nuances of this evolving space.
3. While Bermuda's predominantly principles-based digital asset regime offers significant adaptability and supports innovation, the complex and rapidly evolving domain of tokenisation presents unique challenges that may introduce regulatory uncertainty. As some market participants increase their engagement in tokenisation activities, the need for specific regulatory guidance may arise to clarify how such activities align with the existing laws and standards. Providing targeted guidance in areas of uncertainty would enhance market confidence without undermining the advantages of the principles-based regulatory framework. The goal is to ensure that regulatory developments are carefully tailored to support innovation while maintaining a "same risk, same regulatory outcome" approach, thereby fostering stability and promoting a dynamic marketplace.

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<sup>1</sup> OECD (2021), [Regulatory Approaches to the Tokenisation of Assets](#), OECD Publishing, Paris

<sup>2</sup> OECD (2020). [The Tokenisation of Assets and Potential Implications for Financial Markets](#), OECD Publishing

<sup>3</sup> OECD (2022), [Why decentralised finance \(DeFi\) matters and policy implications](#), OECD Publishing

<sup>4</sup> OECD (2022), [Institutionalisation of crypto-assets and DeFi-TradFi Interconnectedness](#), OECD Publishing

<sup>5</sup> IOSCO (2024). [Update to IOSCO 2023-24 Work Programme, March 2024 – March 2025 Workplan](#).

<sup>6</sup> BIS (2024), Joint report by the Bank for International Settlements (BIS) and Committee on Payments and Market Infrastructures (CPMI), Report to the G20. [Tokenisation in the context of money and other assets: concepts and implications for central banks](#)

<sup>7</sup> FSB (2024), [The Financial Stability Implications of Tokenisation](#)

<sup>8</sup> International Swaps and Derivatives Association, Inc. (2024), [Guidance for a memorandum of law examining the validity and enforceability of collateral arrangements using the ISDA model provisions for tokenised collateral](#)

<sup>9</sup> Digital Asset Business Act 2018. Issuing, selling, or redeeming virtual coins, tokens, or any other form of digital asset; as per section 2(2)(a)

4. Considering the multifaceted nature of asset tokenisation, this DP invites feedback on whether Bermuda's current legal and/or regulatory frameworks require modifications or targeted guidance to address the unique challenges and opportunities in this emerging area. Stakeholder input will play a critical role in ensuring that all relevant possibilities and risks are thoroughly examined, including cases where the existing regime may already provide sufficient certainty for fostering both innovation and client protection. The feedback from this DP will guide further analysis and refinement of potential approaches, leading to the development of a Consultation Paper (CP) that will outline more targeted proposals for consideration. The overarching aim is to ensure that Bermuda remains at the forefront of regulatory innovation while adhering to international best practices and fostering a robust, forward-looking approach to tokenisation.
  
5. Industry and other stakeholders are invited to provide feedback on the proposals outlined in this DP and its attachments. The Bermuda Monetary Authority (Authority or BMA) acknowledges that not all sections and questions may be directly relevant to every stakeholder. Accordingly, stakeholders are encouraged to focus their responses on the areas most applicable to their operations and expertise. However, any insights or observations on other aspects of the paper are welcome and will be given due consideration. Please email feedback and comments directly to [fintech@bma.bm](mailto:fintech@bma.bm) by the close of business on **9 January 2026**.

## II. OVERVIEW AND SCOPE

6. Asset tokenisation involves the digital representation of a Real-World Asset<sup>10</sup> (RWA), whether tangible or intangible, using Distributed Ledger Technology (DLT). By enabling fractional ownership, tokenisation may facilitate broader market participation and improve liquidity for certain high-value or traditionally illiquid asset classes. DLT can streamline processes by reducing intermediaries, enhancing transparency and enabling more efficient settlement mechanisms, such as Delivery-Versus-Payment (DVP) and Delivery-Versus-Delivery (DVD), thereby lowering settlement risks. Additionally, tokenisation can embed regulatory requirements directly into smart contracts, offering 'programmable compliance' that may enforce transfer restrictions, investor qualifications, reporting obligations and disclosures. Tokenisation also has potential applications in areas such as securities lending, reporting and collateral management. While these features could contribute to changes in asset ownership and trading practices, careful consideration is needed to address operational, regulatory and market integrity challenges to ensure their safe and effective implementation.
7. While tokenisation arguably exists along a spectrum with varying degrees of DLT integration<sup>11</sup>, for the purpose of this DP, we will distinguish between two primary modes: off-chain (or digital twins) and on-chain (or native tokens)<sup>12</sup>.
8. Off-chain tokenisation involves the representation of external RWAs on DLT, wherein the actual asset remains outside the DLT. Still, its digital token serves as a representation of ownership or rights to the physical asset. The enforcement of ownership rights remains through traditional legal frameworks. A broad range of RWAs can be tokenised through this approach, including financial instruments (e.g., stocks, bonds, derivatives, investment funds), insurance products (e.g., insurance policies, claims, collateral for underwriting, risk pools, reinsurance), real estate (e.g., residential or commercial properties), commodities (e.g., precious metals), carbon credits and environmental assets and intellectual property and royalties, as well as art and collectibles.
9. Bermuda's existing digital asset framework is sufficiently broad to encompass tokenisation activities. This DP examines a wide range of tokenised RWAs to guide the Authority's consideration of the appropriate regulatory scope. This notwithstanding, it should be specified that Central Bank Digital Currencies and tokenised deposits fall outside this paper, due to the unique characteristics and idiosyncratic risks associated with these asset types, which warrant separate evaluation and consideration.

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<sup>10</sup> A physical or traditional financial asset, whether tangible or intangible, that can be represented as a digital token on DLT.

<sup>11</sup> As outlined in RWA.xyz's ['The Spectrum of Tokenisation' framework](#)

<sup>12</sup> See also the World Economic Forum's Insight Report (2025), titled [Asset Tokenisation in Financial Markets: The Next Generation of Value Exchange](#), which provides a similar classification.

10. Conversely, on-chain tokenisation pertains to the issuance of traditional asset classes directly and solely in tokenised form, with their entire life cycle (from creation to settlement and redemption) preserved within the DLT network, including the enforcement of ownership rights through DLT mechanisms.

***Q1: How likely are you, your clients or the entities you advise to issue, invest in or engage with tokenised assets in Bermuda? Additionally, have you observed discussions, interest or demand for tokenisation among your clients or the sectors within which you operate?***

### III. KEY PROPOSALS

#### TOKENISED INVESTMENTS AND INVESTMENT FUNDS

11. Tokenisation is gaining attention in the realm of investments and investment funds, offering the potential to redefine how assets are created, traded, and accessed. While investments and investment funds (along with their associated service providers) significantly overlap, there are distinct considerations specific to each. As such, this section is divided into two subsections: one focusing on the broader implications of tokenisation in investments and the other examining tokenised investment funds and their distinct regulatory and practical considerations.

#### Investments

12. The Investment Business Act 2003 (IBA) defines investments, investment activities and the conduct of investment business in or from Bermuda. While the Authority considers the existing list of investments to be comprehensive and transparent, it is also mindful of both international and local developments in the financial services sector. The increasing adoption of DLT and the emergence of new business models have the potential to significantly reshape how investments are issued, traded and serviced.
13. In this context, it is important to note that tokenised investments will inherently qualify as “digital assets” under the Digital Asset Business Act 2018 (DABA), given the broad scope of that framework. However, depending on their specific features, they may also simultaneously qualify as “investments” under the Investment Business Act (IBA). This overlap may lead to regulatory duplication or unnecessary complexity for entities. As such, the Authority is considering how activities related to tokenised investments might be appropriately regulated without creating inefficiencies.

#### Tokenisation: Legal Structure and Implications

14. Regulators are increasingly focused on ensuring that tokenised assets are subject to the same standards as their traditional counterparts, regardless of the technological format. This includes consistent application of disclosure, trading, clearing and settlement obligations, as well as enhanced cross-border supervisory coordination to prevent regulatory arbitrage. The legal status and enforceability of tokenised assets – whether relating to ownership, claims against issuers or third parties – depend on the technology, the type of token and the relevant related jurisdiction. These factors are critical for determining the scope of legal protection and the ability to enforce rights associated with tokenised assets.
15. In the tokenisation ecosystem, traditional investments such as equities and bonds may exist either as native tokens or digital twins. The adoption of diverse business models in

tokenisation introduces uncertainty about the regulatory classification and treatment of ‘tokenised’ investments, potentially leading to regulatory arbitrage.

16. For example, tokenised investments may be classified as rights or interests or even contracts for difference (as defined in the IBA), depending on their specific characteristics and how they are structured. This ambiguity can result in inconsistent regulatory obligations across jurisdictions. Shares issued on-chain that represent off-chain ownership rights may trigger additional regulatory requirements, including reporting and disclosure obligations, particularly because their value derives from the underlying off-chain asset.
17. Within the IBA, the term “investment” is defined as an asset, right or interest specified in Part 1 of the First Schedule, including rights and interests in any investment listed in paragraphs one to ten of Part 1 of the First Schedule of the IBA.
18. Consequently, tokenised investments, depending on their structure, characteristics and legal form, may fall within the definition of investments. For example:
  - **Tokenised investments conferring rights or interests:** Where a tokenised asset gives the holder rights and/or interests in an underlying asset listed in paragraphs one to ten of the First Schedule, the tokenised investment falls within the scope of the IBA
  - **Tokenised investments providing exposure only:** Some tokenised investments may only give exposure to the value of the underlying assets, without conferring ownership rights. Depending on their structure, these could potentially also be considered investments under the IBA, such as Contracts for Differences (CFDs)
  - **Native tokenised investments:** These, by design, exist solely on DLT and inherently possess investment characteristics, whether they relate to rights, interests or assets themselves

#### Risks Associated with Tokenised Investments

19. Tokenised investments introduce distinct risks that differ from those associated with traditional financial instruments, primarily due to their reliance on underlying technology and the integration of on-chain and off-chain systems. A key concern is liquidity and volatility, as tokenised assets are often traded on platforms operating 24/7, unlike traditional markets with limited trading hours.
20. Another significant risk relates to the custody and management of physical or off-chain assets underlying tokenised investments, such as bonds or stocks. Proper custody arrangements, effective integration of on-chain and off-chain elements (e.g., through reliable oracles), and robust protections, such as segregation and bankruptcy

remoteness, are critical to safeguarding asset integrity and ensuring investor confidence. Additionally, the cross-jurisdictional nature of tokenised assets presents legal and ownership complexities. Tokens may be issued in one jurisdiction and traded in another, creating uncertainty about the enforceability of rights—such as ownership or claims—depending on the token's legal status, the applicable jurisdiction and the associated technology. These factors underscore the need for clear regulatory frameworks and comprehensive due diligence to address the risks associated with tokenised investments.

21. Given these risks, appropriately regulating investment activities involving tokenised assets is essential to protect investors, promote market integrity, ensure legal certainty, support responsible innovation and align with international standards.

***Q2: Activities relating to tokenised investments may, in certain instances, be subject to both the DABA and IBA frameworks. In your view, what are the implications of this dual regulatory approach for regulatory efficiency, innovation and market development?***

***Q3: Is the current definition of “investment” under the IBA sufficiently clear to encompass tokenised investments? What specific aspects of the definition require further clarification or enhancement?***

***Q4: Do you agree with the Authority’s approach to focus on the substance rather than the form of tokenised investments? Are there practical challenges in applying this principle?***

***Q5a: What specific risks, as well as legal or regulatory challenges, are associated with tokenised investments (differentiating between digital twins and native tokens), particularly in the context of frameworks such as the Companies Act 1981?***

***Q5b: Should digital twins and native tokens be subject to distinct regulatory frameworks or approaches to account for their differences? Why or why not?***

***Q5c: If distinct regulatory frameworks or approaches are deemed necessary, how should the frameworks/approaches differ to effectively address the unique characteristics and functions of digital twins and native tokens?***

***Q5d: How do the risks and legal/regulatory challenges associated with settlement finality differ between digital twins and native tokens, and what implications might these differences have for clearing and settlement processes?***

***Q6: Do you foresee any other [entity level] risks related to tokenisation in investment services that have not been considered in this section? If so, what are these risks, and***

***how might they be addressed through entity-level controls or regulatory measures?***

Investment Activities – Tokenisation (Platform) Providers

22. Further to the above, the Authority noted the growing role of tokenisation (platform) providers and companies involved in the structuring of tokenised investments in the investment sector. Some of these providers operate without directly holding, accessing or controlling client funds. Instead, their role is to manage critical elements of the tokenisation process, including the ‘creation’, ‘management’ ‘support’ and ‘existence’ of tokenised products, as well as ‘customer/user authentication’. On the other hand, there might be instances where the tokenisation platform provider<sup>13</sup> may act as an agent of the issuer and maintain control over tokens, such as burning or freezing tokens or revoking transactions. The latter may create significant challenges (e.g., around record-keeping, reporting requirements and investor confidence), especially for native tokens, since they exist only on-chain.
23. Under the IBA, certain activities conducted by tokenisation platform operators may be classified as investment activities. For instance, operators of platforms that enable investors to buy and sell tokenised investments – where those investments fall within the scope of the IBA – are likely to be engaged in ‘arranging deals in investments’ or ‘dealing in investments.’ This is particularly relevant when the platform facilitates transactions that result in, or are intended to result in, the purchase, sale, subscription to or underwriting of investments.
24. Part 2 of the First Schedule of the IBA defines “arranging deals in investments,” which includes making or offering to make:
- Arrangements with a view to another person buying, selling, subscribing for, or underwriting a particular investment, where such arrangements bring about or would bring about the transaction in question
  - Arrangements with a view to a person who participates in the arrangements buying, selling, subscribing for, or underwriting investments
25. Given the above, it is essential to consider whether firms involved in the lifecycle operations (e.g., distribution and structuring) of tokenised investments would/should fall within the Authority’s regulatory perimeter. The main drivers for such regulation include:
- Investor Protection: Ensuring that investors are adequately protected from the risks associated with tokenised investments
  - Market Integrity: Ensuring markets are fair, transparent and efficient, with a focus on protecting investors and reducing systemic risk

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<sup>13</sup> A service provider that facilitates the creation, management, and distribution of digital tokens representing RWAs.

- Reduction of Systemic Risk: Identifying, monitoring, mitigating and managing risks, to reduce the potential for a cascading failure and severe economic downturn

***Q7: Do you think any activities performed by tokenisation platform providers, such as the structuring of tokenised investments, fall under existing investment activities?***

***Q8a: Given the emergence of innovative investment business models, do you consider it necessary to revisit and potentially expand the definition of investment activities under the IBA, to ensure that all (relevant) activities – particularly those arising from new technologies and business structures – are comprehensively regulated?***

***Q8b: What challenges or benefits could arise from such an expansion, and what would be the impact on the current regulatory framework?***

***Q9a: Are there any other third-party service providers that form part of the tokenisation lifecycle (such as oracles, custodians, data providers or technical service providers) that directly or indirectly impact investor protection or market integrity and, in your view, should fall within the Authority's regulatory perimeter?***

***Q9b: If so, what specific functions do they perform that warrant regulatory oversight, and what form might such oversight take?***

## **Investment Funds**

26. Tokenisation of investment fund interests represents a potential evolution in how fund shares (or units) are issued, transferred and administered. Through DLT, tokenisation may enhance operational efficiency, reduce settlement times, and, by lowering minimum investment thresholds through fractional ownership, democratise access to previously exclusive asset classes. This expansion of accessibility broadens the potential investor base, providing retail investors with opportunities (and risks) historically reserved for institutional or sophisticated market participants.
27. Currently, tokenised funds fall primarily under the Investment Funds Act 2006 (IFA) and potentially the Digital Asset Issuance Act 2020 (DAIA), unless qualifying for an exemption, rather than DABA. Fund service providers are regulated under various frameworks, including the IBA for fund managers and custodians, the Fund Administration Provider Business Act 2019 (FAPBA) for administrators and potentially DABA for digital asset custody services.

28. Under Bermuda's IFA, professional funds are designed specifically for 'qualified participants'<sup>14</sup>, who meet stringent qualification criteria. This investor eligibility framework serves as a crucial investor protection mechanism by ensuring that only those with sufficient financial resources and presumed investment knowledge can participate in these potentially higher-risk investment vehicles. The Authority is aware that technological capabilities exist to mitigate eligibility verification risks in tokenised environments. Specifically, accreditation parameters can be hard-coded into the smart contract governing the tokens, creating a programmable compliance layer. With this technology, if an investor does not meet the issuer's eligibility criteria, a transaction will be automatically rejected, regardless of the parties' intentions. This represents a potential enhancement over traditional systems by making compliance automatic and immutable rather than dependent on manual verification processes. These permissioned token standards could effectively maintain the professional fund's restrictions while potentially offering greater efficiency than current administrative processes.
29. Professional closed funds under Bermuda's IFA (e.g., private equity or venture capital funds) are specifically structured with intentional liquidity constraints to align with their investment strategies in illiquid assets. Tokenisation, however, introduces a critical tension: while it enhances operational efficiency through features like faster settlement and fractionalisation, it can also risk disrupting the essential illiquidity premium these funds are designed to capture. The technology enables liquidity and frequent transfers, potentially creating a disconnect between the 'appearance of liquidity' provided by tokenisation and the asset's actual underlying illiquidity. This misalignment could pose challenges in managing investor expectations and maintaining the investment discipline inherent to closed-end structures. As such, it is crucial to carefully evaluate how to safeguard the fundamental characteristics of closed-ended funds while leveraging the operational advantages offered by tokenisation.
30. In the context of tokenised fund interests, the traditional roles of fund custodians and fund administrators encounter new complexities, requiring a detailed understanding of their distinctions and areas of overlap. Fund custodians are primarily responsible for safeguarding assets, ensuring their security and verifying their existence on behalf of the fund. This duty traditionally involves holding physical or financial assets and reconciling ownership records, but tokenisation introduces novel elements, such as managing private keys associated with digital tokens, overseeing smart contract functionality governing token transfers and maintaining secure digital wallets. Custodians must adapt to these technological requirements while continuing to fulfil their regulatory obligations to protect asset integrity. Their core focus remains on safeguarding and validating the fund's assets.
31. By contrast, fund administrators are focused on operational efficiency and compliance.

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<sup>14</sup> As per the definition under Section 9 of the IFA

Their responsibilities include calculating Net Asset Value (NAV), managing financial reporting, processing investor transactions (e.g., subscriptions, redemptions, and transfers), and ensuring regulatory compliance. Administrators play a critical role in maintaining the day-to-day operations of the fund, including managing ownership records and reporting data to investors, auditors and regulators. In tokenised contexts, administrators may need to reconcile DLT-based ownership records with traditional regulatory filings and financial systems to ensure data accuracy and continuity across these domains. Their core focus is operational management rather than asset security.

32. Despite these distinct roles, tokenisation has created new areas of overlap between fund custodians and administrators. For example, the reconciliation of tokenised assets (i.e., the process of ensuring that a digital token represents accurately the underlying assets or fund interests) requires collaboration. Custodians focus on verifying asset security and validating the existence of tokens on DLT, while administrators ensure that tokenised ownership aligns with investor records and meets compliance standards. Similarly, in systems governed by smart contracts, custodians may manage the technical aspects of contract security and execution, while administrators monitor the investor data tied to those contracts for regulatory or operational purposes.
33. Data synchronisation becomes increasingly critical in the context of tokenised funds, particularly those that enable continuous, round-the-clock trading. In hybrid systems where the underlying assets remain non-tokenised but are represented by tokenised wrappers, administrators face the challenge of accurately maintaining alignment between off-chain records – such as investor ownership details and fund documentation – and their on-chain counterparts. Tokenised funds can strain traditional batch-based fund administration processes, where practices like end-of-day NAV (Net Asset Value) calculations and business-day transaction cut-offs become less relevant. Continuous wallet movements further complicate the accuracy of investor registers, reconciliations and transfer-agency controls. As a result, fund administration could shift toward event-driven, on-chain-aware processes – using intraday or windowed NAV and accrual engines, on-chain register updates with calibrated transfer rules, deterministic DvP settlement and reconciliation, clear oracle and timestamp conventions, robust key-management playbooks and audit-ready on-chain evidence to support assurance and reporting.

***Q10a: Given that tokenised funds currently fall under the IFA and potentially DAIA (rather than DABA), do you think the industry view is that a dual licensing/authorisation requirement creates unnecessary duplication? Please explain your reasoning.***

***Q10b: Would a single regulatory regime be sufficient to appropriately mitigate all risks associated with tokenised funds? If so, what, in your view, would be the most appropriate regime and why?***

***Q11a: What legal certainty is currently lacking within Bermuda's frameworks (e.g., IFA, IBA, FAPBA, DABA, DAIA, etc.) to adequately support tokenised fund operations and***

***accommodate the features unique to DLT, such as the use of DLT-based registers as official registers for tokenised funds?***

***Q11b: Where a DLT-based register serves as an official register for tokenised funds, what approaches are suitable for rectifying erroneous information?***

***Q12a: Are current governance frameworks, roles and responsibilities of fund managers, administrators, custodians and distributors adequate for tokenised funds? Please explain any specific limitations or challenges in applying traditional fund governance models to tokenised funds.***

***Q12b: Are traditional distinctions between fund service providers (such as between custodians and administrators) still relevant in the context of tokenised funds, or is there a need for more collaborative or converged models? Please provide examples of how these roles might evolve.***

***Q12c: What adaptations or enhancements to existing governance frameworks should be made to ensure investor protection in tokenised funds, particularly regarding oversight of specialised third-party service providers (e.g., custodians, exchanges, smart contract developers, oracle providers and token issuance platforms)?***

***Q12d: What are your views on the role of, or relationship to, self-custody arrangements, such as those undertaken by fund managers, in the context of tokenisation? Should self-custody be permissible? If so, should this be allowed in general or should it depend on the novelty and technical attributes of the underlying asset being custodied? If the latter, please provide further details.***

***Q13a: What technological and operational safeguards that are specific to tokenised fund structures should be implemented to protect investors?***

***Q13b: How should disclosure standards address the unique risks of potential discrepancies between off-chain documentation (e.g., offering documents) and on-chain encoded terms?***

***Q14: Are traditional investor rights, such as voting, access to information and complaint procedures, adequately preserved in tokenised fund structures? If not, to what extent should they be adapted to address the unique features of tokenised environments?***

***Q15a: Are there any specific challenges associated with the valuation of tokenised funds? For example, are there concerns about discrepancies between off-chain and on-chain systems or NAV calculation for hybrid or digital asset funds? Please describe these challenges and their potential impact on fund operations and investor protection.***

***Q15b: What specific challenges exist in liquidity management for tokenised funds, particularly regarding the potential disconnect between token tradability and underlying asset liquidity? How might these challenges affect investor expectations and fund stability?***

***Q15c: Are there unique reporting challenges for tokenised funds, such as reconciling on-chain data with traditional financial reporting requirements? If so, what are these challenges?***

***Q15d: How might the challenges identified in the valuation, liquidity management and reporting of tokenised funds be effectively addressed through regulatory guidance, industry standards or technological solutions?***

## TOKENISATION IN INSURANCE

34. The Authority is reviewing emerging activities as they relate to the tokenisation of insurance products, namely Insurance-Linked Securities (ILS) and how such activities might be appropriately regulated under the existing framework for innovative insurance classes. Bermuda's established regulatory frameworks for innovative insurers (Classes IIGB, IILT, along with Sandbox classes IGB and ILT) and digital assets (DABA), combined with the Segregated Accounts Companies Act 2000 and Incorporated Segregated Accounts Companies Act 2019, have created a proven foundation for insurance tokenisation, with existing licensees successfully demonstrating and operationalising DLT-based insurance products supervised under bespoke prudential capital requirements.
35. The convergence of tokenisation with Bermuda's traditional ILS sector – encompassing catastrophe bonds, collateralized reinsurance and sidecars – presents opportunities to enhance liquidity, reduce transaction costs and expand access to insurance risk transfer while maintaining prudential oversight.
36. Key considerations include: (1) the interaction between tokenised insurance products and existing Special Purpose Insurer (SPI)/collateralised insurer structures that currently dominate Bermuda's ILS market; (2) whether tokenisation enables new risk-sharing mechanisms that do not fit neatly into current class distinctions (e.g., micro-parametric products, peer-to-peer risk pools or DeFi-integrated reinsurance); (3) how the secondary market trading of tokenised insurance risks compares to existing catastrophe bond trading on the Bermuda Stock Exchange; and (4) the implications for Bermuda's position as global ILS markets consider tokenisation as a next-generation infrastructure.
37. Additionally, the BMA intends to examine how tokenisation intersects with emerging ILS trends, including the expansion beyond property catastrophe risks into cyber, mortality and casualty securitisation. As the traditional ILS market diversifies its risk

profile and increasingly attracts capital inflows, tokenisation could accelerate this evolution by enabling more granular risk slicing, real-time exposure management and integration with parametric triggers and oracle networks.

38. The regulatory framework should also consider whether Bermuda's established ILS infrastructure – including service providers, administrators and listing requirements – needs adaptation to support tokenised structures, or whether the existing framework with targeted enhancements can accommodate this innovation. Critical to this analysis is ensuring that any regulatory approach supports Bermuda's strengths in speed-to-market, regulatory sophistication and market confidence, while avoiding unintended barriers that could hinder the development of tokenised insurance products within the jurisdiction.

***Q16a: Given that the IIGB and IILT classes already provide a framework for DLT-based insurance, what specific regulatory changes or clarifications would facilitate scaling tokenised insurance products?***

***Q16b: What considerations should apply to existing SPIs/collateralised insurers seeking to incorporate tokenisation into their operations?***

***Q17a: How should tokenised insurance risk transfer interact with Bermuda's existing ILS ecosystem, including catastrophe bond structures, Bermuda Stock Exchange listings and traditional service providers (such as trustees, calculation agents and collateral managers)? Are there specific areas where tokenisation could enhance or potentially disrupt existing ILS market practices?***

***Q17b: What regulatory enhancements would optimise the integration of tokenisation into the ILS market while preserving market stability and policyholder protection?***

***Q18a: What specific regulatory features would maintain Bermuda's position as a global ILS domicile while ensuring international recognition of tokenised insurance products?***

***Q18b: What supervisory coordination mechanisms specific to tokenised ILS do you consider (or have you seen) as particularly effective in mitigating risks in cross-border contexts?***

***Q19a: What novel insurance risk-sharing structures enabled by tokenisation (such as fractional reinsurance participation at smaller scales, peer-to-peer risk pools or DeFi-integrated parametric products) do you see emerging that may fall outside the contemplation of existing innovative insurance classes? Please describe these structures and their potential benefits.***

***Q19b: What risks associated with tokenised insurance innovations are currently not being addressed adequately under the current regimes for innovative insurer classes?***

***How should the regulatory framework be enhanced to address these risks while supporting innovation?***

***Q20: Are there any unique risks or challenges related to tokenisation in insurance that have not been addressed in this section? If so, how might these be mitigated?***

## **TOKENISATION OF ALTERNATIVE ASSETS**

39. This section delves into the application of tokenisation within specific asset classes – namely, real estate, precious metals and energy and environmental efficiency markets. These sectors represent diverse examples of how DLT can be leveraged to fractionalise ownership, enhance liquidity and streamline transactions. While tokenisation can be extended to other asset classes (e.g., art or intellectual property), the Authority’s understanding is that the underlying principles governing its implementation in these markets remains broadly applicable across different domains. Accordingly, this section focuses on these three sectors, with the understanding that the fundamental concepts discussed here can be applied *mutatis mutandis* to other asset classes and therefore will not be addressed separately.

### **Real estate**

40. Real estate tokenisation represents an innovative application of DLT and smart contracts, with the potential to modernise the ownership and transfer of property assets. By converting real estate into digital tokens, this concept facilitates both complete and fractional ownership, which can potentially increase flexibility and accessibility for a broader range of investors. Property assets or their associated cash flows can be represented as tokens, enabling improved liquidity and streamlined processes.

41. The implementation of real estate tokenisation has taken various forms internationally, often leveraging DLT’s unique capabilities to address inefficiencies in traditional property markets. One approach involves using a Non-Fungible Token (NFT) to represent a specific property, with ownership of the NFT equating to ownership of the entire property. In such models, the transfer of the NFT signifies a change in property ownership. Another scenario involves dynamic NFTs that update in real time to reflect changes in property attributes, such as renovations or other material improvements, thereby enhancing transparency and information flow.

42. Another prevalent approach is the fractionalisation model, which involves issuing fungible tokens to represent fractional ownership of a property. Each token corresponds to a specific percentage of ownership, with implementation methods typically categorised as (1) an indirect approach – where the property is transferred to a Special Purpose Vehicle (SPV) that has tokenised shares; or (2) a direct approach where tokens represent actual land registry entries or property rights. Both approaches

aim to unlock benefits such as increased liquidity for traditionally illiquid assets, lower investment barriers through fractionalisation, shorter settlement times and greater efficiencies in property management.

43. Currently, the indirect approach, leveraging SPVs, is more widely used due to its compatibility with existing legal frameworks. In the case of Bermuda, it is important to differentiate between initiatives aimed at tokenising portfolios of foreign real estate managed from Bermuda and efforts specifically focused on tokenising Bermuda's domestic real estate market. The tokenisation of domestic real estate may introduce additional considerations and complexities that are not as relevant when dealing with portfolios of foreign holdings.
44. Secondary market dynamics present unique challenges for tokenised real estate. Unlike traditional property markets, where valuations occur periodically through professional appraisals, tokenised real estate markets require more frequent price discovery mechanisms to support secondary trading. This creates a dependency on third-party valuers and data providers whose assessments directly impact token values. Price discovery for secondary-market trading in tokenised real estate remains challenging, as it relies on external valuations that may not be delivered in real-time. This can create potential mismatches between token prices and the underlying asset values, particularly on weekends or after hours when traditional property markets are closed but token markets continue to operate. As market infrastructure evolves, standardisation of valuation methodologies and integration with regulated trading venues are expected to enhance transparency and pricing accuracy. The development of reliable oracle networks to provide accurate property valuations and the establishment of industry standards for tokenised real estate valuation will be crucial for addressing these price discovery challenges.
45. The direct approach involves complex legal considerations, including the tokenisation of land registries, the treatment of legal title and the transfer of legal ownership. Additionally, this approach necessitates the involvement of other governmental stakeholders. As such, it falls outside the current scope of this DP and warrants further in-depth analysis.

***Q21: For the indirect approach via SPVs, what legal and regulatory updates should be considered to support tokenised real estate portfolios, taking into account both domestic and foreign markets while also ensuring investor protections and alignment with Bermuda's legal structures?***

***Q22: What challenges, risks and unique factors should be considered when evaluating the direct tokenisation of property rights, such as title transfer, land registry integration and associated legal frameworks?***

***Q23: What unique transparency and disclosure considerations should apply specifically to tokenised real estate projects that differ from other tokenised assets, particularly regarding property valuation methodologies, fractional ownership structures and the governance of physical asset management?***

***Q24: What mechanisms and standards are necessary to enable interoperability between tokenisation platforms and traditional real estate infrastructure (e.g., land registries, escrow services and title systems)?***

***Q25: What governance structures, maintenance safeguards and custodial standards should be implemented to protect the physical assets underlying tokenised real estate, particularly when ownership is fractionalised among multiple holders?***

***Q26: Beyond the specific asset classes discussed (real estate, precious metals, etc.), are there other risks or challenges in tokenising alternative assets that merit regulatory consideration?***

## Precious metals

46. The tokenisation of precious metals, such as gold, represents another emerging technological development in the financial markets<sup>15</sup>. By creating digital tokens 1:1 backed by physical gold stored in secure vaults, tokenisation seeks to address the logistical challenges of storing and transferring physical gold while enabling gold ownership to be divided into precise fractions. This technological innovation has the potential to enhance accessibility and liquidity in gold markets. Furthermore, the integration of tokenised gold with DLT-based financial platforms facilitates the use of gold in collateralised transactions and DeFi protocols, which may increase the functionality of gold as a financial asset. Importantly, as gold has historically been regarded as a natural hedge against inflation, currency devaluation and geopolitical risks, the tokenisation of gold can be seen as a modern evolution of this traditional function. By providing a digital, highly liquid and easily transferable form of gold ownership, tokenisation extends the relevance of gold's hedging strategy into the digital asset ecosystem.
47. The technological infrastructure supporting tokenised gold enables 24/7 global trading, a significant departure from traditional gold markets that operate only five days per week during limited hours. Similar to tokenised investments (referenced in a previous section of this DP), this continuous trading capability may create potential price mismatches between tokenised gold (trading 24/7) and traditional gold markets, particularly over weekends.
48. Tokenisation does not introduce intermediaries into the gold ecosystem but rather

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<sup>15</sup> Examples include [PAXG](#), [XAUt](#), [WisdomTree Gold Token](#) etc.

integrates and digitises the roles of existing players, such as refineries that certify gold's quality (e.g. ensuring 99.99% purity to meet or exceed LBMA standards), and professional vault operators responsible for secure storage and insurance coverage. Critical to this ecosystem's integrity are robust verification mechanisms, including professional audits and real-time allocation tools that provide transparency regarding the physical gold backing digital tokens, with oracles playing a vital role in maintaining accurate price feeds between traditional and tokenised markets.

***Q27: What overarching principles should govern the tokenisation of precious metals like gold to ensure safety, fairness and transparency? How do the unique risks and benefits of tokenised precious metals, inform these principles compared to traditional markets?***

***Q28: What additional specific disclosure requirements should tokenised gold (or other precious metals) issuers meet to ensure investors understand the associated risks, including information on the quality, location, storage and insurance coverage of the physical gold (or other precious metal) backing the tokens?***

***Q29: What regulatory standards and oversight mechanisms should apply to intermediaries involved in the tokenised gold (or other precious metal) ecosystem, such as vault operators, refineries and auditors, particularly with respect to procedures like physical audits of gold (or other precious metal) reserves?***

## **Energy Efficiency and Environmental Markets**

49. The tokenisation of assets in energy efficiency and environmental markets represents another innovative frontier with the potential to enhance market accessibility, transparency and liquidity. Through DLT, tokenised systems enable the digital representation of various energy-related assets, such as carbon credits, electricity, renewable energy certificates (RECs), energy efficiency certificates and even offset claims.
50. However, energy-related markets present unique challenges that differ considerably from tokenisation involving tangible assets (e.g., gold or real estate). These assets are often linked to environmental or energy-related outcomes that are intangible by nature and inherently tied to real-world data sources, such as renewable energy production, reductions in energy consumption or avoided emissions. The digital representation of these assets depends on reliable mechanisms to measure, verify and track their underlying claims – whether that is renewable energy generation, carbon reduction or energy efficiency improvements.
51. Risks unique to the tokenisation of these markets include the potential for double counting (e.g., crediting the same energy reduction or renewable claim in multiple markets), and challenges in integrating off-chain infrastructure such as energy grids, certification bodies and physical energy storage with digital on-chain systems.

Governance concerns are also prominent, including the need for robust mechanisms to manage the lifecycle of these assets, ensuring transparency in issuance, transfer and retirement. Additionally, interoperability among diverse tokenised markets and their alignment with existing energy registries remain critical gaps to address.

***Q30: Are there any enhancements or adjustments needed in the current regulatory framework to effectively accommodate the full lifecycle of tokenised energy and environmental assets, including issuance, validation, transfer and retirement? In addressing this, consider how to ensure reliability, transparency and proper verification processes to mitigate risks such as double issuance, double counting or greenwashing.***

***Q31: What measures (e.g., regulatory safeguards, disclosures or industry standards) could strengthen investor protection, promote market confidence and address the unique risks and characteristics of tokenised energy and environmental assets, particularly for retail participants?***

## PERMISSIONED AND PERMISSIONLESS DLT

52. On permissionless blockchains, tokenised instruments may interact seamlessly with stablecoins, on-chain liquidity pools and smart contracts, meaning that clearing, settlement and custody could occur through decentralised mechanisms rather than traditional intermediaries. This raises questions about where regulatory oversight should focus and whether it should focus on the instruments themselves or on the platforms and protocols facilitating these functions.

53. On permissioned blockchains, while access and validation are restricted, tokenised assets may still depend on bridges or settlement rails linked to broader digital-asset ecosystems. As such, participants might consider whether the operational and prudential risks arising from these infrastructures align more naturally with the oversight envisaged under DABA, rather than with frameworks primarily designed for intermediated markets.

***Q32: How should regulatory frameworks address the differing risks and operational characteristics of permissionless and permissioned blockchains, particularly with respect to clearing, settlement and custody mechanisms?***

***Q33: Do you think that DABA would be better suited to address the prudential and operational risks associated with tokenised assets on blockchain infrastructure? If not, what alternative approaches should be considered?***

## PLATFORMS - CONVERGENCE

54. As platform functionality converges, universal wallets could emerge that hold and transact multiple token types (e.g., money-like tokens and stablecoins, tokenised

investments, insurance-linked tokens and benefits), with safekeeping, transfer and settlement occurring within a single user interface and key-management stack. If so, prudential and conduct risks may concentrate at the platform layer (custody, client-asset segregation, operational resilience, recovery/key loss, conflicts of interest, disclosure and portability), potentially rendering product-silo frameworks (e.g., the IBA for investments or insurance statutes for protection products) less effective for the core risk locus.

55. Participants may therefore wish to consider whether an activity- and platform-centric framework for DLT custody, transfer and settlement, such as DABA, or coordinated recognition of such a framework, could provide a more coherent supervisory perimeter for universal wallets, with product-specific rules applied where necessary to address residual, instrument-level risks.

***Q34: Do you agree that the convergence of functionality at the platform layer – encompassing custody, client-asset segregation, operational resilience, conflicts of interest and other risks – necessitates a shift from product-specific regulatory frameworks toward a more activity- and platform-centric approach?***

***Q35: Do you think DABA is an appropriate framework to address these emerging risks at the platform level? If not, what alternative approaches could better balance the need for platform-level supervision with product-specific rules to address residual risks?***

## **ANTI-MONEY LAUNDERING AND ANTI-TERRORIST FINANCING**

56. Tokenisation introduces novel compliance dimensions in the area of Anti-Money Laundering (AML) and Anti-Terrorist Financing (ATF), warranting careful evaluation of both the opportunities and challenges it presents. This section explores the AML/ATF capabilities this technology presents, with a focus on assessing how these functionalities align with Bermuda’s AML/ATF framework and the Financial Action Task Force (FATF) Standards. The Authority considers the concept of functional equivalence, examining whether AML/ATF controls implemented through innovative mechanisms, such as smart contracts or permissioned ledgers, can achieve outcomes comparable to those of traditional compliance methods. This approach highlights the potential for technology to enhance operational efficiency while safeguarding the integrity of financial systems.
57. Tokenisation has the capability to enable potential integration of features such as whitelisting, Know-Your-Client (KYC) gating and transfer controls directly into token architecture. These functionalities, if effectively implemented, may facilitate the automation of compliance processes and strengthen transaction traceability, in alignment with international standards such as the FATF Travel Rule. However, questions remain regarding the consistency and effectiveness of such solutions across

diverse token standards and platforms, especially when balancing the principles of adaptability, security and innovation.

58. Key considerations also include the interoperability of AML/ATF mechanisms to prevent fragmentation and ensure auditability across tokenised ecosystems. Discussions around harmonising compliance tools and exploring innovations such as privacy-preserving technologies, like zero-knowledge proof-based KYC, will be important as the field evolves. Additionally, applying AML/ATF measures to tokenisation activities raises questions about their alignment with existing standards, such as FATF Recommendation 15, particularly as tokenising assets is not currently classified as a virtual asset-related activity under FATF frameworks. Exploring these issues will be integral to evaluating the regulatory and practical implications of tokenisation in the context of Bermuda's AML/ATF framework and broader international standards.

***Q36: How can embedded AML/ATF features in token standards (e.g., transfer restrictions, whitelisting) impact compliance efficiency? What specific features or functionalities do you consider most valuable for monitoring and overseeing compliance in tokenised transactions, and what tokenisation standards are best suited to embed these features while balancing market efficiency and secondary trading?***

***Q37: What challenges do you foresee in aligning AML/ATF obligations across multiple regimes? How should AML/ATF obligations interface between different regimes?***

***Q38a: What role could digital identity systems play in strengthening AML/ATF compliance within tokenised ecosystems, particularly in enhancing identity verification and reducing the duplication of KYC processes across stakeholders?***

***Q38b: Are current DLT-agnostic identity attestation solutions sufficient to meet Bermuda's AML/ATF requirements and international standards? If not, what specific enhancements or alternative approaches would be necessary?***

***Q39: How can interoperability between traditional AML/ATF systems and DLT-based compliance tools be effectively achieved?***

***Q40: How do you perceive the potential for developing a unified AML/ATF onboarding process, such as a 'passportable' KYC system, that could be acknowledged across multiple regulatory frameworks to enhance and simplify compliance efforts?***

***Q41: Are there emerging ML or TF typologies specific to tokenised assets that are not addressed by traditional AML/ATF frameworks or by the considerations in this***

*section?*

## CONDUCT

59. The BMA recognises that conduct-related requirements, such as ensuring fair treatment, providing timely disclosures, safeguarding client assets and addressing anti-market abuse obligations, are technology-agnostic and must be upheld regardless of the underlying systems. These principles remain essential for fostering customer trust and protecting market integrity in the context of tokenisation. However, the Authority acknowledges that tokenisation and its underlying technologies may offer unique attributes, such as programmable smart contracts and digital identities, which could facilitate the satisfaction of these requirements in potentially more efficient and innovative ways. For instance, metadata embedded in tokens or contracts could streamline disclosures, suitability assessments or investor verification processes, demonstrating how technology might enhance compliance mechanisms.
60. While these core principles (fair treatment, transparency, responsible business practices, asset protection, accessible dispute resolution and customer understanding) remain unchanged, the BMA seeks to explore how tokenisation can integrate these requirements effectively. Industry feedback is invited to determine whether bespoke adjustments to regulatory approaches are needed for tokenised transactions and to identify practices or standards that could best address these obligations while leveraging the efficiencies of the technology.

***Q42: What measures are firms implementing to prevent market manipulation and insider trading in tokenised markets to help ensure fair and orderly trading environments?***

***Q43: What cross-cutting principles should guide disclosures, suitability assessments and risk warnings across all tokenised products? How might these principles be tailored for different investor segments (retail versus professional)?***

***Q44: What investor education requirements or initiatives should be implemented to ensure that retail investors understand the risks specific to tokenised products?***

***Q45: Are there any unique conduct risks arising from tokenisation that may require additional regulatory guidance beyond what has been discussed in this section?***

## CYBER RISK

61. The tokenisation of assets introduces a complex hybrid threat landscape that extends beyond traditional financial services cybersecurity concerns. Effective cyber governance for tokenisation demands a balanced approach to both on-chain and off-chain

elements. On-chain governance involves the programmatic rules embedded in smart contracts and protocols that dictate how changes are proposed, voted on and implemented. Key safeguards include mandatory time locks for system upgrades, minimum voting quorums for decisions and independent security audits of all proposals. Off-chain governance focuses on human and procedural elements. This includes documented playbooks for incident response and treasury management, role-based permissions with strict access controls for critical infrastructures and transparent community oversight to ensure accountability in significant decision-making. Notably, historical incidents show that the most significant financial losses in tokenisation have arisen not from smart contract bugs alone, but from failures in governance, economic design, reserve mismanagement and insider threats, underscoring the need for holistic cyber risk oversight.

62. Tokenisation risks can be evaluated through three key principles that serve as a framework: integrity, availability and interoperability. Integrity protects the accuracy, authenticity and immutability of both the asset and its digital token, as breaches could lead to unauthorised token creation, incorrect asset valuations or smart contract manipulation. Availability ensures that tokenised assets and their functionalities remain accessible when needed, while disruptions (such as network congestion, infrastructure failures or attacks) threaten their utility and undermine market confidence. Interoperability, in the context of tokenisation, is treated as a core risk dimension that governs secure interactions across tokens, protocols, DLTs and external data sources. While it enhances the utility of tokenised systems, it also introduces risks such as contagion from DeFi protocol failures, vulnerabilities in cross-chain bridges and oracle manipulation. This broad scope of interoperability extends beyond the traditional scope of security pillars and thus requires specialised focus in the tokenisation space.

#### Stage 1: Asset Selection and Structuring

63. The first stage of the asset tokenisation lifecycle is foundational and critical, as it sets the stage for the assets being tokenised to be properly identified, legally validated and prepared for integration into the DLT. This stage occurs entirely off-chain, meaning errors, omissions, or fraudulent practices here cannot be rectified by on-chain technology at a later stage. Critically, technical controls cannot remediate fundamental failures in legal due diligence. Tokenising a fraudulent, encumbered or overvalued asset creates an irrecoverable risk that propagates through the entire lifecycle.
64. The risks in this phase revolve particularly around data accuracy and data integrity. Inaccurate data, whether due to manual mistakes or automated processing errors, can compromise token valuations, lead to legal disputes or undermine investor trust. Similarly, data integrity is a key concern, as original legal documents or master data files could be altered, destroyed or lost if they are not securely stored in access-controlled, audited and tamper-evident vaults (whether digital or physical).

***Q46: Given that the initial tokenisation phase operates primarily off-chain, what cybersecurity controls should be applied to the interfaces between external validators (lawyers, auditors, asset valuers) and tokenisation platforms?***

***Q47: What role-based access controls and segregation of duties frameworks are most effective in preventing the unauthorised manipulation of data during the pre-tokenisation mapping and ingestion processes?***

***Q48: What digital identity verification standards should be applied to all parties involved in the asset selection and structuring phase to prevent impersonation fraud and false claims of partnership or endorsement?***

### Stage 2: Token Creation

65. Also known as minting, this stage involves the technical generation of tokens on DLT. This process carries key risks, including unauthorised minting. This is when malicious actors create tokens illegitimately, leading to reconciliation failures and the creation of unbacked ‘phantom tokens’ that undermine trust and solvency.

***Q49: Do you agree that minting should be conditional upon receiving an auditable 1:1 verification from an independent, third-party custodian? Why or why not?***

***Q50: Given that unauthorised mints typically result from compromised operator keys or internal collusion, what are the most effective approaches to secure minting authority keys, including the use of multi-signature schemes, hardware-backed solutions (e.g. HSMs/MPC) and time-lock mechanisms?***

### Stage 3: Smart Contract Development and Deployment

66. This stage involves the software engineering phase, where the on-chain logic, rules and security features governing the token are written and permanently implemented on the DLT. This phase carries several key risks, including code vulnerabilities such as re-entrancy attacks or integer overflows/underflows. The risks also include upgradability and administration, where admin privileges create a single point of failure, as well as supply chain risks stemming from vulnerabilities in third-party libraries or development tools used during contract creation. For upgradable contracts, the long-term security posture depends more on the integrity of upgrade governance than on the initial code quality. This means making secure and effective administration a key element of the ongoing risk management procedures.

***Q51: What practices and standards should be followed to ensure the security and reliability of smart contracts, including independent audits and measures like reproducible builds and pinned dependencies? Are these sufficient to mitigate risks such as code vulnerabilities and supply chain attacks?***

***Q52a: Do you agree that upgradable smart contracts should be subject to stricter governance controls, such as requiring multi-signature wallets with time-locks for upgrades? Please explain your reasoning.***

***Q52b: What additional measures can help address the risks associated with admin keyholders and protect against insider threats in tokenisation systems? Please provide specific examples of effective controls or best practices.***

***Q53a: What is your opinion on implementing circuit-breaker mechanisms to pause critical contract functionality during active attacks? Please address both the potential benefits and risks of such mechanisms.***

***Q53b: Beyond circuit-breakers, what other incident response controls should be considered to mitigate the potential impact of exploits in real-time? Please provide specific examples of effective controls and their implementation considerations.***

#### Stage 4: Token Issuance and Distribution

67. This stage involves the initial allocation and sale of newly minted tokens, a high-profile event that often attracts attackers targeting investors. Key risks at this stage include front-running and Maximal Extractable Value (MEV), where automated bots exploit DLT transparency to gain unfair advantages, potentially disadvantaging retail participants. Additionally, phishing, impersonation and domain spoofing become significant concerns, as attackers leverage the event's visibility to execute social engineering schemes. These schemes involve deceiving investors into sending money to fraudulent addresses or directing them to counterfeit websites.

***Q54a: What are the most effective mechanisms to ensure fairness during token issuance events, such as batch auctions or other launch methodologies?***

***Q54b: Are additional measures needed to protect retail participants from the exploitation of DLT transparency by bots?***

***Q55a: Given that user losses during token launches often result from phishing and social engineering attacks, what safeguards should be in place to strengthen user protection?***

***Q55b: How effective are controls like digitally signed announcements and user education campaigns in mitigating these risks?***

***Q56a: What technical controls, such as Domain Name System Security Extensions***

***(or other measures), should tokenisation projects implement to prevent domain hijacking and protect end-users from being redirected to malicious sites during high-profile events?***

***Q56b: Are there additional controls that should be considered to secure communication channels?***

#### Stage 5: Post-Issuance Trading and Management

68. This phase involves the ongoing management of the token, including its trading on exchanges and integration within the broader DeFi ecosystem. This stage introduces key architectural risks, such as composition risk from external DeFi protocol integrations, where vulnerabilities in these protocols can impact the token. Additionally, cross-chain risk arises from the use of blockchain bridges, which are high-value targets and serve as centralised points of failure. Oracle risk is also significant, as reliance on external data feeds, particularly for price data, exposes the token to potential manipulation or inaccuracies.

***Q57a: What due diligence standards and risk management practices should be adopted when integrating tokens with external DeFi protocols?***

***Q57b: Would maintaining an on-chain allowlist of approved integrations and setting exposure caps meaningfully mitigate the risks of contagion from third-party failures?***

***Q58: Given the significant financial losses caused by bridge exploits, what criteria should be used to evaluate and select secure cross-chain bridges? Are long operational histories, multiple independent audits and transparent teams sufficient, or are additional compensating controls needed?***

***Q59: What are the best practices for mitigating oracle risks, such as data manipulation or inaccuracies, during token management? Should decentralised oracle networks, Time-Weighted Average Price (TWAP) mechanisms and circuit breakers be considered standard controls, or are there other measures the industry should prioritise?***

#### Stage 6: Redemption and Realisation

69. This stage involves two interconnected processes critical to a token's life cycle. Redemption is the on-chain technical process in which a token holder surrenders their token to the smart contract to be burned. Realisation, on the other hand, is the off-chain economic process where the issuer delivers the underlying asset to the token holder. The primary risk in this stage is counterparty insolvency, where the issuer lacks sufficient assets to honour redemptions, potentially triggering a 'bank run' dynamic.

This creates a critical vulnerability where the on-chain redemption process may succeed, but the off-chain realisation could fail, leaving token holders exposed to significant economic risks.

***Q60a: What measures should be adopted to ensure the reliability and robustness of redemption mechanisms, such as protections against Denial of Service (DoS) attacks?***

***Q60b: Would implementing features like queue throttling and per-address caps be effective in addressing these risks?***

***Q61a: Do you think that cryptographic attestations confirming the release of off-chain assets could serve as an effective mitigating safeguard when integrated with on-chain redemption processes?***

***Q61b: What additional controls or alternative approaches should be considered to address counterparty insolvency risks in tokenisation frameworks?***

#### Stage 7: Token Destruction or Burning

70. The last stage of the asset tokenisation lifecycle involves permanently removing tokens from circulation, often following a redemption event or as a deflationary mechanism. This process carries key technological risks, including flawed burn logic, where bugs in the smart contract could result in an incorrect number of tokens being destroyed, and irreversible mis-burns, where tokens are accidentally sent to an unrecoverable address, leading to unintended losses.

***Q62a: What practices should be adopted to minimise risks associated with token burning, such as flawed burn logic or irreversible mis-burns?***

***Q62b: Do you think that using well-tested, audited and standardised burnable contract code is sufficient to address the risks associated with token burning? If not, what alternative or additional controls, processes or practices should entities consider to enhance the security and reliability of token destruction mechanisms?***

71. Human vulnerabilities represent a critical dimension in token security, as cyber exploits frequently target the "people layer" rather than technical systems. Insider threats from privileged individuals can be mitigated through geo-distributed multi-signature authorisation and independent oversight, while social engineering attacks require defences including phishing-resistant hardware keys and targeted security training. The supply chain presents another significant vulnerability vector, necessitating controls like reproducible builds and dependency scanning to detect compromised components. In practice, token security is commonly breached through several prevalent attack patterns, including sophisticated phishing campaigns that use convincing website

replicas, malicious token approval requests that grant attackers unlimited spending authority, and zero-day exploits targeting previously unknown vulnerabilities in widely adopted, audited smart contracts. These interconnected threats underscore the importance of comprehensive security strategies that address both technical and human elements of the tokenisation ecosystem.

***Q63a: Do you agree with the key risks identified by the Authority, including the focus on people-related risks and common token security attack vectors?***

***Q63b: Are there additional risks or areas of concern that you believe should be captured as part of this risk assessment?***

72. Due to the risks associated with tokenisation, such as vulnerabilities in smart contracts, bridges and token management processes, specific controls and enhancements must be integrated into a cyber risk framework. Effective incident detection, response and recovery are critical components of a robust cyber risk control framework for tokenised systems. To enable a rapid response, emergency measures such as circuit breakers and migration pathways must be pre-authorised, technically implemented and governance-approved in advance, not improvised during a crisis.

***Q64a: How important do you believe regular tabletop exercises and red-team simulations are for preparing for high-impact scenarios like bridge exploits, oracle manipulation or key compromise?***

***Q64b: Are there other testing methodologies you know of that could improve readiness?***

***Q65: Do you agree with the necessity of pre-authorised emergency tools, such as circuit-breakers and kill switches, to contain incidents effectively? If yes, what governance, technical or activation controls should be in place to ensure their secure and responsible use?***

***Q66a: What are your views on implementing detection tools like on-chain anomaly monitoring, mempool analytics and external threat intelligence as part of real-time threat monitoring?***

***Q66b: Additionally, are structured processes for migrating to patched contracts and regular audits sufficient for ensuring resilient recovery operations, or are there other recovery practices that firms should consider?***

***Q67: Beyond the cyber risks outlined in this section, are there other emerging technological vulnerabilities or attack vectors specific to tokenised assets that should inform the Authority's approach?***

## FINANCIAL STABILITY CONSIDERATIONS

73. Tokenisation presents several interrelated financial stability risks that could become systemic if adoption scales significantly. Its programmability and composability (enabling the creation of interconnected smart contracts) heighten reliance among system components, creating ‘dependency risk.’ The vulnerability of a single contract can cascade across the ecosystem, amplifying shocks<sup>16</sup>.
74. Liquidity mismatches between tokens and their underlying assets pose risks, particularly the potential for redemption runs when tokens are perceived as more liquid than their underlying assets<sup>17</sup>. As referenced in previous sections in this DP, timing mismatches between 24/7 token markets and fixed-hour traditional markets may complicate liquidity management, while the integration of tokenised assets into DeFi ecosystems can increase exposure to systemic volatility through activities like token trading and borrowing<sup>18</sup>.
75. Tokenisation can further raise significant systemic risks due to composability and operational vulnerabilities. Limitless composability may enable the proliferation of complex derivatives and interconnected financial strategies (e.g. yield aggregation), which drive opacity and amplify systemic interconnectedness. These risks can be compounded by dependency on underdeveloped interoperability mechanisms such as bridging and minting/burning processes, increasing exposure to operational glitches, exploitation or failure<sup>19</sup>. Additionally, tokenisation platforms can foster excessive leverage buildup through the rehypothecation of tokenised assets, while reliance on a limited number of third-party service providers can introduce concentration risks and single points of failure<sup>20</sup>.
76. Operational fragilities, such as smart contract vulnerabilities, governance challenges in permissionless systems and limited transaction processing capacity, could pose risks to market stability. The demand for continuous 24/7 operations may amplify the consequences of technical failures, particularly in contexts where settlement finality remains unclear<sup>21</sup>. However, it is also important to recognize that decentralised systems, by design, can exhibit qualities of anti-fragility. Their distributed nature and ability to adapt or self-correct in response to localised disruptions may, under certain conditions, enhance system resilience over time.

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<sup>16</sup> ESMA (2024), [Decentralised Finance: A categorisation of smart contracts, ESMA Working Paper No. 3](#), August 2024

<sup>17</sup> FSB (2024). [The Financial Stability Implications of Tokenisation](#)

<sup>18</sup> *Idem*

<sup>19</sup> World Economic Forum's Insight Report (2025), [Asset Tokenisation in Financial Markets: The Next Generation of Value Exchange](#)

<sup>20</sup> FSB (2024). [The Financial Stability Implications of Tokenisation](#)

<sup>21</sup> *Idem*

***Q68: What safeguards can be implemented to address the 'dependency risk' created by programmable and composable smart contracts, including preventing cascading vulnerabilities, managing limitless composability risks (such as complex derivatives), and mitigating excessive leverage buildup through rehypothecation of tokenised assets?***

***Q69: What measures can ensure better alignment between the liquidity of tokenised assets and their underlying reference assets, as well as mitigate timing mismatches between 24/7 token markets and traditional market hours?***

***Q70a: Could tokenisation be employed to present riskier or less liquid reference assets as safe and easily tradable instruments, potentially encouraging greater leverage and risk-taking?***

***Q70b: What measures could be implemented to reduce the likelihood of this occurring?***

***Q71a: Could a decline in market confidence in tokenised markets trigger investors to quickly sell off their tokenised assets?***

***Q71b: What strategies could be used to reduce the risk of this happening?***

***Q72: Are there any additional risks posed by tokenisation to financial stability, beyond those identified in this section, that should be considered?***

***Q73: Are there additional systemic or financial stability risks related to tokenisation that have not been addressed in this section? How might these risks be monitored or mitigated?***

## **MISCELLANEOUS MATTERS**

73. Further to the topics covered in this DP, the BMA recognises that there are additional matters warranting attention in the context of legal challenges under Bermuda laws. These may include, for instance, the clarification of the definition of property as it pertains to tokenised assets, the enforceability of on-chain issuance and transfers of native tokens, and issues related to the use of tokenised assets as collateral, such as their recognition, valuation and enforceability within Bermuda's current legal and financial frameworks. The Authority invites stakeholders to comment on these matters to ensure that the regulatory framework will adequately accommodate the unique characteristics of tokenised assets while remaining compatible with Bermuda's broader legal landscape.

***Q74: Beyond sector-specific issues addressed elsewhere in this DP, what broader***

*legal challenges or constraints under Bermuda law may hinder the adoption of tokenisation (e.g., the definition of 'property' as it relates to accommodating both native tokens and digital twins)?*

*Q75a: What specific legal and technical considerations arise in the transfer and settlement of tokenised assets, whether they are native or digital twins?*

*Q75b: How can atomic settlement methods be reconciled with traditional legal requirements for title transfer, and how should settlement finality be defined in tokenised transactions?*

*Q76a: What dispute resolution mechanisms are most appropriate for addressing conflicts involving tokenised assets? Specifically, to what extent can DLT be utilised to embed alternative dispute resolution systems, such as arbitration, under the laws of Bermuda?*

*Q76b: What are the opportunities, challenges and considerations for integrating arbitration agreements (whether as natural language clauses, smart arbitration agreements or bespoke 'modules') into smart legal contracts, and for leveraging DLT platforms to govern and enforce these processes?*

*Q77: Do existing secured lending/borrowing frameworks adequately address the unique characteristics of tokenised collateral, or are modifications required?*

*Q78: In the context of Bermuda's insolvency and liquidation frameworks, how should the distinction between native tokens (representing the asset itself with potential in rem rights<sup>22</sup>) and digital twins (representing a right in an underlying asset, potentially classified as a right in personam<sup>23</sup>) influence the treatment of token holders? Should token holders be regarded as (i) creditors; (ii) shareholders; or (iii) a distinct class of stakeholders, and what principles or safeguards should guide this classification to ensure fair outcomes during insolvency proceedings?*

*Q79: What key components should a regulatory framework include to effectively address the cross-border challenges associated with RWAs, particularly when the physical asset storage, digital token issuance, trading activities and client bases encompass multiple jurisdictions with differing legal and regulatory requirements?*

*Q80: Are there any emerging trends or novel forms of tokenisation that you have observed which are not addressed in this DP?*

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<sup>22</sup> IMF (2023), Garrido, J. M., [Digital Tokens: A Legal Perspective](#)

<sup>23</sup> *Idem*

#### IV. CONCLUSION AND NEXT STEPS

74. The Authority has undertaken a comprehensive examination of asset tokenisation across multiple sectors and regulatory domains throughout this DP. Asset tokenisation represents a transformative approach to representing RWAs using DLT, with significant implications for Bermuda's financial services ecosystem. The Authority recognises that while tokenisation presents considerable opportunities for enhancing market efficiency, accessibility and innovation, it also introduces novel regulatory challenges that warrant careful consideration. Throughout this paper, the Authority has explored the application of tokenisation across investments, insurance, alternative assets, and other sectors, while examining cross-cutting considerations, including AML/ATF compliance, conduct requirements, cyber risk management, and financial stability implications.
75. The Authority's approach to tokenisation is guided by several key principles: maintaining a technology-neutral "same risk, same regulatory outcome" approach; ensuring appropriate investor and market protections; fostering responsible innovation; and aligning with international standards. During the consultation process, the Authority aims to determine whether Bermuda's existing regulatory frameworks adequately address the unique characteristics of tokenisation or whether targeted enhancements are needed to provide greater clarity and certainty to market participants. The Authority recognises the value of balancing innovation with appropriate safeguards and seeks to develop a regulatory approach that achieves this equilibrium.
76. The Authority welcomes feedback on the questions presented in this DP and any related topics **by the close of business on 9 January 2026**. As mentioned previously, a Consultation Paper will be published early next year, which will encapsulate pertinent feedback received from this DP and present more targeted proposals for consideration.

## ANNEX – CONSOLIDATED QUESTIONS

Section	Question
<b>Overview and Scope</b>	Q1: <i>How likely are you, your clients or the entities you advise to issue, invest in or engage with tokenised assets in Bermuda? Additionally, have you observed discussions, interest or demand for tokenisation among your clients or the sectors within which you operate?</i>
<b>Investments</b>	<p>Q2: Activities relating to tokenised investments may, in certain instances, be subject to both the DABA and IBA frameworks. In your view, what are the implications of this dual regulatory approach for regulatory efficiency, innovation and market development?</p> <p>Q3: Is the current definition of “investment” under the IBA sufficiently clear to encompass tokenised investments? What specific aspects of the definition require further clarification or enhancement?</p> <p>Q4: Do you agree with the Authority’s approach to focus on the substance rather than the form of tokenised investments? Are there practical challenges in applying this principle?</p> <p>Q5a: What specific risks, as well as legal or regulatory challenges, are associated with tokenised investments (differentiating between digital twins and native tokens), particularly in the context of frameworks such as the Companies Act 1981?</p> <p>Q5b: Should digital twins and native tokens be subject to distinct regulatory frameworks or approaches to account for their differences? Why or why not?</p> <p>Q5c: If distinct regulatory frameworks or approaches are deemed necessary, how should the frameworks/approaches differ to effectively address the unique characteristics and functions of digital twins and native tokens?</p> <p>Q5d: How do the risks and legal/regulatory challenges associated with settlement finality differ between digital twins and native tokens, and what implications might these differences have for clearing and settlement processes?</p> <p>Q6: Do you foresee any other [entity level] risks related to tokenisation in investment services that have not been considered in this section? If so, what are these risks, and how might they be addressed through entity-level controls or regulatory measures?</p> <p>Q7: Do you think any activities performed by tokenisation platform providers, such as the structuring of tokenised investments, fall under existing investment activities?</p>

Q8a: Given the emergence of innovative investment business models, do you consider it necessary to revisit and potentially expand the definition of investment activities under the IBA, to ensure that all (relevant) activities - particularly those arising from new technologies and business structures - are comprehensively regulated?

Q8b: What challenges or benefits could arise from such an expansion, and what would be the impact on the current regulatory framework?

Q9a: Are there any other third-party service providers that form part of the tokenisation lifecycle (such as oracles, custodians, data providers or technical service providers) that directly or indirectly impact investor protection or market integrity and, in your view, should fall within the Authority's regulatory perimeter?

Q9b: If so, what specific functions do they perform that warrant regulatory oversight, and what form might such oversight take?

***Investment  
Funds***

Q10a: Given that tokenised funds currently fall under the IFA and potentially DAIA (rather than DABA), do you think the industry view is that a dual licensing/authorisation requirement creates unnecessary duplication? Please explain your reasoning.

Q10b: Would a single regulatory regime be sufficient to appropriately mitigate all risks associated with tokenised funds? If so, what, in your view, would be the most appropriate regime and why?

Q11a: What legal certainty is currently lacking within Bermuda's frameworks (e.g., IFA, IBA, FAPBA, DABA, DAIA, etc.) to adequately support tokenised fund operations and accommodate the features unique to DLT, such as the use of DLT-based registers as official registers for tokenised funds?

Q11b: Where a DLT-based register serves as an official register for tokenised funds, what approaches are suitable for rectifying erroneous information?

Q12a: Are current governance frameworks, roles and responsibilities of fund managers, administrators, custodians and distributors adequate for tokenised funds? Please explain any specific limitations or challenges in applying traditional fund governance models to tokenised funds.

Q12b: Are traditional distinctions between fund service providers (such as between custodians and administrators) still relevant in the context of tokenised funds, or is there a need for more collaborative or converged models? Please provide examples of how these roles might evolve.

Q12c: What adaptations or enhancements to existing governance frameworks should be made to ensure investor protection in tokenised funds, particularly regarding oversight of specialised third-party service providers (e.g., custodians,

exchanges, smart contract developers, oracle providers and token issuance platforms)?

Q12d: What are your views on the role of, or relationship to, self-custody arrangements, such as those undertaken by fund managers, in the context of tokenisation? Should self-custody be permissible? If so, should this be allowed in general or should it depend on the novelty and technical attributes of the underlying asset being custodied? If the latter, please provide further details.

Q13a: What technological and operational safeguards that are specific to tokenised fund structures should be implemented to protect investors?

Q13b: How should disclosure standards address the unique risks of potential discrepancies between off-chain documentation (e.g., offering documents) and on-chain encoded terms?

Q14: Are traditional investor rights, such as voting, access to information and complaint procedures, adequately preserved in tokenised fund structures? If not, to what extent should they be adapted to address the unique features of tokenised environments?

Q15a: Are there any specific challenges associated with the valuation of tokenised funds? For example, are there concerns about discrepancies between off-chain and on-chain systems or NAV calculation for hybrid or digital asset funds? Please describe these challenges and their potential impact on fund operations and investor protection.

Q15b: What specific challenges exist in liquidity management for tokenised funds, particularly regarding the potential disconnect between token tradability and underlying asset liquidity? How might these challenges affect investor expectations and fund stability?

Q15c: Are there unique reporting challenges for tokenised funds, such as reconciling on-chain data with traditional financial reporting requirements? If so, what are these challenges?

Q15d: How might the challenges identified in the valuation, liquidity management and reporting of tokenised funds be effectively addressed through regulatory guidance, industry standards or technological solutions?

### ***Insurance***

Q16a: Given that the IIGB and IILT classes already provide a framework for DLT-based insurance, what specific regulatory changes or clarifications would facilitate scaling tokenised insurance products?

Q16b: What considerations should apply to existing SPIs/collateralised insurers seeking to incorporate tokenisation into their operations?

Q17a: How should tokenised insurance risk transfer interact with Bermuda's existing ILS ecosystem, including catastrophe bond structures, Bermuda Stock Exchange listings and traditional service providers (such as trustees, calculation agents and collateral managers)? Are there specific areas where tokenisation could enhance or potentially disrupt existing ILS market practices?

Q17b: What regulatory enhancements would optimise the integration of tokenisation into the ILS market while preserving market stability and policyholder protection?

Q18a: What specific regulatory features would maintain Bermuda's position as a global ILS domicile while ensuring international recognition of tokenised insurance products?

Q18b: What supervisory coordination mechanisms specific to tokenised ILS do you consider (or have you seen) as particularly effective in mitigating risks in cross-border contexts?

Q19a: What novel insurance risk-sharing structures enabled by tokenisation (such as fractional reinsurance participation at smaller scales, peer-to-peer risk pools or DeFi-integrated parametric products) do you see emerging that may fall outside the contemplation of existing innovative insurance classes? Please describe these structures and their potential benefits.

Q19b: What risks associated with tokenised insurance innovations are currently not being addressed adequately under the current regimes for innovative insurer classes? How should the regulatory framework be enhanced to address these risks while supporting innovation?

Q20: Are there any unique risks or challenges related to tokenisation in insurance that have not been addressed in this section? If so, how might these be mitigated?

***Alternative Assets***

Q21: For the indirect approach via SPVs, what legal and regulatory updates should be considered to support tokenised real estate portfolios, taking into account both domestic and foreign markets while also ensuring investor protections and alignment with Bermuda's legal structures?

Q22: What challenges, risks and unique factors should be considered when evaluating the direct tokenisation of property rights, such as title transfer, land registry integration and associated legal frameworks?

Q23: What unique transparency and disclosure considerations should apply specifically to tokenised real estate projects that differ from other tokenised assets, particularly regarding property valuation methodologies, fractional ownership structures and the governance of physical asset management?

Q24: What mechanisms and standards are necessary to enable interoperability between tokenisation platforms and traditional real estate infrastructure (e.g., land registries, escrow services and title systems)?

Q25: What governance structures, maintenance safeguards and custodial standards should be implemented to protect the physical assets underlying tokenised real estate, particularly when ownership is fractionalised among multiple holders?

Q26: Beyond the specific asset classes discussed (real estate, precious metals, etc.), are there other risks or challenges in tokenising alternative assets that merit regulatory consideration?

Q27: What overarching principles should govern the tokenisation of precious metals like gold to ensure safety, fairness and transparency? How do the unique risks and benefits of tokenised precious metals, inform these principles compared to traditional markets?

Q28: What additional specific disclosure requirements should tokenised gold (or other precious metals) issuers meet to ensure investors understand the associated risks, including information on the quality, location, storage and insurance coverage of the physical gold (or other precious metal) backing the tokens?

Q29: What regulatory standards and oversight mechanisms should apply to intermediaries involved in the tokenised gold (or other precious metal) ecosystem, such as vault operators, refineries and auditors, particularly with respect to procedures like physical audits of gold (or other precious metal) reserves?

Q30: Are there any enhancements or adjustments needed in the current regulatory framework to effectively accommodate the full lifecycle of tokenised energy and environmental assets, including issuance, validation, transfer and retirement? In addressing this, consider how to ensure reliability, transparency and proper verification processes to mitigate risks such as double issuance, double counting or greenwashing.

Q31: What measures (e.g., regulatory safeguards, disclosures or industry standards) could strengthen investor protection, promote market confidence and address the unique risks and characteristics of tokenised energy and environmental assets, particularly for retail participants?

***Permissioned  
and  
Permissionless  
DLT***

Q32: How should regulatory frameworks address the differing risks and operational characteristics of permissionless and permissioned blockchains, particularly with respect to clearing, settlement and custody mechanisms?

Q33: Do you think that DABA would be better suited to address the prudential and operational risks associated with tokenised assets on blockchain infrastructure? If not, what alternative approaches should be considered?

**Platforms -  
Convergence**

Q34: Do you agree that the convergence of functionality at the platform layer - encompassing custody, client-asset segregation, operational resilience, conflicts of interest and other risks - necessitates a shift from product-specific regulatory frameworks toward a more activity- and platform-centric approach?

Q35: Do you think DABA is an appropriate framework to address these emerging risks at the platform level? If not, what alternative approaches could better balance the need for platform-level supervision with product-specific rules to address residual risks?

**AML/ATF**

Q36: How can embedded AML/ATF features in token standards (e.g. transfer restrictions, whitelisting) impact compliance efficiency? What specific features or functionalities do you consider most valuable for monitoring and overseeing compliance in tokenised transactions, and what tokenisation standards are best suited to embed these features while balancing market efficiency and secondary trading?

Q37: What challenges do you foresee in aligning AML/ATF obligations across multiple regimes? How should AML/ATF obligations interface between different regimes?

Q38a: What role could digital identity systems play in strengthening AML/ATF compliance within tokenised ecosystems, particularly in enhancing identity verification and reducing the duplication of KYC processes across stakeholders?

Q38b: Are current DLT-agnostic identity attestation solutions sufficient to meet Bermuda's AML/ATF requirements and international standards? If not, what specific enhancements or alternative approaches would be necessary?

Q39: How can interoperability between traditional AML/ATF systems and DLT-based compliance tools be effectively achieved?

Q40: How do you perceive the potential for developing a unified AML/ATF onboarding process, such as a 'passportable' KYC system, that could be acknowledged across multiple regulatory frameworks to enhance and simplify compliance efforts?

Q41: Are there emerging ML or TF typologies specific to tokenised assets that are not addressed by traditional AML/ATF frameworks or by the considerations in this section?

**Conduct**

Q42: What measures are firms implementing to prevent market manipulation and insider trading in tokenised markets to help ensure fair and orderly trading environments?

Q43: What cross-cutting principles should guide disclosures, suitability assessments and risk warnings across all tokenised products? How might these principles be tailored for different investor segments (retail versus professional)?

Q44: What investor education requirements or initiatives should be implemented to ensure that retail investors understand the risks specific to tokenised products?

Q45: Are there any unique conduct risks arising from tokenisation that may require additional regulatory guidance beyond what has been discussed in this section?

**Cyber Risk**

Q46: Given that the initial tokenisation phase operates primarily off-chain, what cybersecurity controls should be applied to the interfaces between external validators (lawyers, auditors, asset valuers) and tokenisation platforms?

Q47: What role-based access controls and segregation of duties frameworks are most effective in preventing the unauthorised manipulation of data during the pre-tokenisation mapping and ingestion processes?

Q48: What digital identity verification standards should be applied to all parties involved in the asset selection and structuring phase to prevent impersonation fraud and false claims of partnership or endorsement?

Q49: Do you agree that minting should be conditional upon receiving an auditable 1:1 verification from an independent, third-party custodian? Why or why not?

Q50: Given that unauthorised mints typically result from compromised operator keys or internal collusion, what are the most effective approaches to secure minting authority keys, including the use of multi-signature schemes, hardware-backed solutions (e.g. HSMs/MPC) and time-lock mechanisms?

Q51: What practices and standards should be followed to ensure the security and reliability of smart contracts, including independent audits and measures like reproducible builds and pinned dependencies? Are these sufficient to mitigate risks such as code vulnerabilities and supply chain attacks?

Q52a: Do you agree that upgradable smart contracts should be subject to stricter governance controls, such as requiring multi-signature wallets with time-locks for upgrades? Please explain your reasoning.

Q52b: What additional measures can help address the risks associated with admin keyholders and protect against insider threats in tokenisation systems? Please provide specific examples of effective controls or best practices.

Q53a: What is your opinion on implementing circuit-breaker mechanisms to pause critical contract functionality during active attacks? Please address both the potential benefits and risks of such mechanisms.

Q53b: Beyond circuit-breakers, what other incident response controls should be considered to mitigate the potential impact of exploits in real-time? Please provide specific examples of effective controls and their implementation considerations.

Q54a: What are the most effective mechanisms to ensure fairness during token issuance events, such as batch auctions or other launch methodologies?

Q54b: Are additional measures needed to protect retail participants from the exploitation of DLT transparency by bots?

Q55a: Given that user losses during token launches often result from phishing and social engineering attacks, what safeguards should be in place to strengthen user protection?

Q55b: How effective are controls like digitally signed announcements and user education campaigns in mitigating these risks?

Q56a: What technical controls, such as Domain Name System Security Extensions (or other measures), should tokenisation projects implement to prevent domain hijacking and protect end-users from being redirected to malicious sites during high-profile events?

Q56b: Are there additional controls that should be considered to secure communication channels?

Q57a: What due diligence standards and risk management practices should be adopted when integrating tokens with external DeFi protocols?

Q57b: Would maintaining an on-chain allowlist of approved integrations and setting exposure caps meaningfully mitigate the risks of contagion from third-party failures?

Q58: Given the significant financial losses caused by bridge exploits, what criteria should be used to evaluate and select secure cross-chain bridges? Are long operational histories, multiple independent audits and transparent teams sufficient, or are additional compensating controls needed?

Q59: What are the best practices for mitigating oracle risks, such as data manipulation or inaccuracies, during token management? Should decentralised oracle networks, Time-Weighted Average Price (TWAP) mechanisms and circuit breakers be considered standard controls, or are there other measures the industry should prioritise?

Q60a: What measures should be adopted to ensure the reliability and robustness of redemption mechanisms, such as protections against Denial of Service (DoS) attacks?

Q60b: Would implementing features like queue throttling and per-address caps be effective in addressing these risks?

Q61a: Do you think that cryptographic attestations confirming the release of off-chain assets could serve as an effective mitigating safeguard when integrated with on-chain redemption processes?

Q61b: What additional controls or alternative approaches should be considered to address counterparty insolvency risks in tokenisation frameworks?

Q62a: What practices should be adopted to minimise risks associated with token burning, such as flawed burn logic or irreversible mis-burns?

Q62b: Do you think that using well-tested, audited and standardised burnable contract code is sufficient to address the risks associated with token burning? If not, what alternative or additional controls, processes or practices should entities consider to enhance the security and reliability of token destruction mechanisms?

Q63a: Do you agree with the key risks identified by the Authority, including the focus on people-related risks and common token security attack vectors?

Q63b: Are there additional risks or areas of concern that you believe should be captured as part of this risk assessment?

Q64a: How important do you believe regular tabletop exercises and red-team simulations are for preparing for high-impact scenarios like bridge exploits, oracle manipulation or key compromise?

Q64b: Are there other testing methodologies you know of that could improve readiness?

Q65: Do you agree with the necessity of pre-authorised emergency tools, such as circuit-breakers and kill switches, to contain incidents effectively? If yes, what governance, technical or activation controls should be in place to ensure their secure and responsible use?

Q66a: What are your views on implementing detection tools like on-chain anomaly monitoring, mempool analytics and external threat intelligence as part of real-time threat monitoring?

Q66b: Additionally, are structured processes for migrating to patched contracts and regular audits sufficient for ensuring resilient recovery operations, or are there other recovery practices that firms should consider?

Q67: Beyond the cyber risks outlined in this section, are there other emerging technological vulnerabilities or attack vectors specific to tokenised assets that should inform the Authority's approach?

**Financial  
Stability**

Q68: What safeguards can be implemented to address the 'dependency risk' created by programmable and composable smart contracts, including preventing cascading vulnerabilities, managing limitless composability risks (such as complex derivatives), and mitigating excessive leverage buildup through rehypothecation of tokenised assets?

Q69: What measures can ensure better alignment between the liquidity of tokenised assets and their underlying reference assets, as well as mitigate timing mismatches between 24/7 token markets and traditional market hours?

Q70a: Could tokenisation be employed to present riskier or less liquid reference assets as safe and easily tradable instruments, potentially encouraging greater leverage and risk-taking?

Q70b: What measures could be implemented to reduce the likelihood of this occurring?

Q71a: Could a decline in market confidence in tokenised markets trigger investors to quickly sell off their tokenised assets?

Q71b: What strategies could be used to reduce the risk of this happening?

Q72: Are there any additional risks posed by tokenisation to financial stability, beyond those identified in this section, that should be considered?

Q73: Are there additional systemic or financial stability risks related to tokenisation that have not been addressed in this section? How might these risks be monitored or mitigated?

**Miscellaneous  
Matters**

Q74: Beyond sector-specific issues addressed elsewhere in this DP, what broader legal challenges or constraints under Bermuda law may hinder the adoption of tokenisation (e.g., the definition of 'property' as it relates to accommodating both native tokens and digital twins)?

Q75a: What specific legal and technical considerations arise in the transfer and settlement of tokenised assets, whether they are native or digital twins?

Q75b: How can atomic settlement methods be reconciled with traditional legal requirements for title transfer, and how should settlement finality be defined in tokenised transactions?

Q76a: What dispute resolution mechanisms are most appropriate for addressing conflicts involving tokenised assets? Specifically, to what extent can DLT be utilised to embed alternative dispute resolution systems, such as arbitration, under the laws of Bermuda?

Q76b: What are the opportunities, challenges and considerations for integrating arbitration agreements (whether as natural language clauses, smart arbitration agreements or bespoke 'modules') into smart legal contracts, and for leveraging DLT platforms to govern and enforce these processes?

Q77: Do existing secured lending/borrowing frameworks adequately address the unique characteristics of tokenised collateral, or are modifications required?

Q78: In the context of Bermuda's insolvency and liquidation frameworks, how should the distinction between native tokens (representing the asset itself with potential in rem rights<sup>24</sup>) and digital twins (representing a right in an underlying asset, potentially classified as a right in personam<sup>25</sup>) influence the treatment of token holders? Should token holders be regarded as (i) creditors; (ii) shareholders; or (iii) a distinct class of stakeholders, and what principles or safeguards should guide this classification to ensure fair outcomes during insolvency proceedings?

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<sup>25</sup> *Idem*

Bermuda Monetary Authority  
BMA House  
43 Victoria Street  
Hamilton HM 12  
Bermuda

Tel: (441) 295 5278

Fax: (441) 292 7471

Website: <https://www.bma.bm>

