1 THE MULTI-MILLION-DOLLAR PARADOX

A $10 million yacht may attract twenty interested investors—yet none wants to buy it alone. A private aircraft may have dozens of potential users, each needing only a fraction of its available time. The demand exists. The assets exist. What is missing is a mechanism that can bring them together.

Traditional auctions seek one buyer; fixed-price fractional offerings impose a price before discovering what different participants will pay for different quantities. Even after an asset is divided, two questions remain: How can the portfolio grow without starting over? And how can its rights trade afterward?

FairBidLabs connects three answers: Direct Fractional Auctions (DFA), NAV-based portfolio expansion, and Batch Double Auctions (BDA).

2 DFA — THE COLLECTIVE BUYER EMERGES

In a DFA, participants submit sealed bids (q, p): a requested quantity of indivisible units and a total price. All-or-Nothing bids require the entire quantity; Partial-Out bids permit smaller whole-unit allocations. The winner determination algorithm combines bids rather than selling units one by one.

Maximize F* = Σ accepted bid values, subject to Σ allocated units ≤ K.

The Winner Determination Rule uses r-decomposition and pruning to find the revenue-maximizing feasible combination, respecting bid types and applicable group constraints. If fewer than K announced units win, only those units are issued and collectively represent 100% of the offered rights. Auction success requires F* to meet the Seller Value.

One mathematical mechanism serves two distinct economic models. Ownership creates defined fractional interests in an asset or portfolio. Usage & Time allocates access—such as flight seats or yacht hours—through Fixed Schedule or Flexible Booking entitlements. Usage rights can expire or be consumed; ownership rights are governed by their separate terms.

3 NAV — HOW A SINGLE ASSET BECOMES A PORTFOLIO

A first acquisition is not the end of the story. Suppose investors jointly acquire one yacht and later want to add a second. Must they dissolve their original investment and begin again? NAV provides the accounting bridge between successive issuances.

NAV = Portfolio Value / Outstanding Tokens

Imagine a successful initial DFA creates a $10 million ownership portfolio with 100 tokens: NAV is $100,000. A second yacht is proposed with Seller Value of $5 million, corresponding to 50 announced new tokens at the existing NAV. If the new auction clears at $5.5 million and issues all 50 tokens:

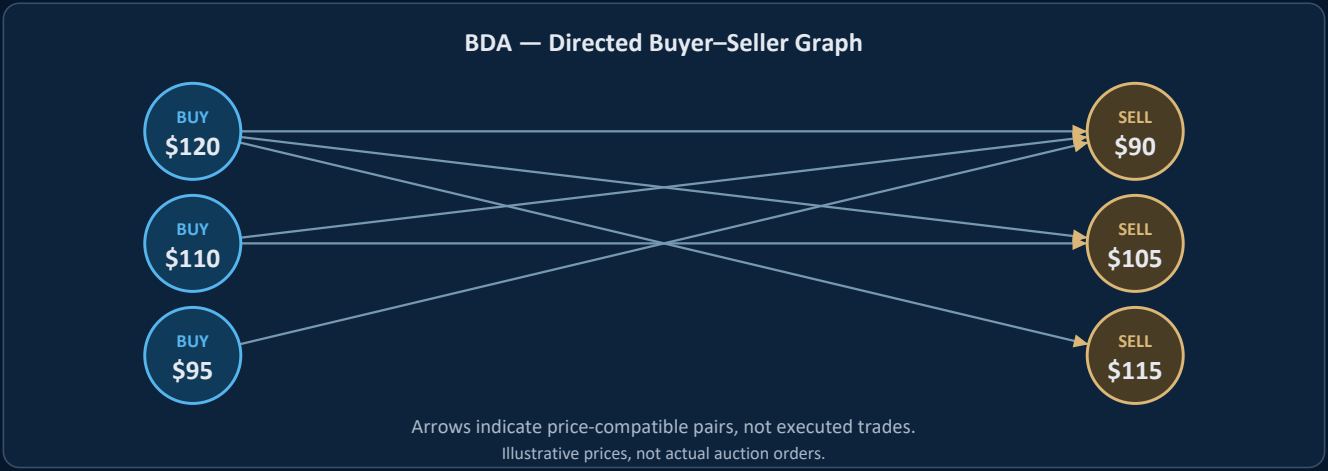
New NAV = ($10m + $5.5m) / (100 + 50) = $103,333.33

The original owners keep their tokens; the same portfolio now contains two yachts. Additional assets can be accumulated through further DFA issuances, with advance notice and a token-weighted veto process for existing owners. NAV is a consistent auction-based accounting reference—not a guaranteed resale price or independent appraisal.

4 BDA — ONE PRICE, EVEN UNDER CONSTRAINTS

Primary allocation answers who acquires the rights. Secondary trading asks a different question: What price will today's buyers and sellers accept? NAV cannot answer it; an actual market must.

Batch Double Auctions collect buy and sell limit orders over a defined interval, then evaluate them together rather than executing orders sequentially. BDA seeks to maximize feasible executed value subject to buyer and seller limits, available holdings and trading constraints, while establishing a single uniform clearing price for all executed transactions within a successful batch.



When its initial clearing conditions fail, BDA applies a defined Repair procedure. Under specified unsuccessful first-batch outcomes, a second batch permits the same participants to improve only their limit prices: buyers may raise bids and sellers may lower asks. There is no third batch. Successful executions within a batch share one clearing price; unsuccessful batches need not trade.

A token's BDA price may be above or below Ownership NAV. NAV records portfolio accounting; BDA discovers what market participants are willing to exchange today. Neither a batch auction nor NAV guarantees liquidity.

5 THE API — TWO AUCTIONS, ONE CONTINUOUS RECORD

Without a connection, DFA and BDA would remain two isolated inventions. FairBidLabs joins them through a secure, versioned API that carries verifiable issuance and settlement records from DFA to BDA. The receiving platform validates instrument identity, issued supply, approved metadata, and transfer eligibility; Organizer approval precedes secondary trading.

DFA issuance → API verification → BDA clearing → settlement → rights update

Before trading, BDA verifies the seller's current available rights. After settlement, the authoritative ownership or entitlement records are reconciled. For Usage & Time, eligibility additionally depends on transferability, expiration, booking restrictions, and unconsumed quantity. BDA transfers existing eligible DFA-origin rights; it does not create new ones.

6 THE OPPORTUNITY

The innovation is not merely dividing a yacht, aircraft, property, or other asset into tokens. It is the repeatable market process: collective acquisition through mathematical optimization, accumulation of assets through NAV-based ownership expansion, uniform-price secondary trading, and verified transfer across one connected infrastructure.

Different assets retain different legal and economic rights. Yet they can share the same auction architecture.

Different assets. Different rights. One connected auction infrastructure.

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The framework is being developed and tested using virtual assets and funds. Real-world transactions require applicable legal, regulatory, settlement and operational arrangements. NAV, liquidity, and investment returns are not guaranteed.