

Reverse Logistics -

**BACK
TO
THE FUTURE**



SOLE

**The International
Society of Logistics**

AGENDA

- Differences
- Key Concepts
 - KPP & KSAs for Sustainment
- The Defining Aspects Of Reverse Logistics
 - Challenges & Opportunities
- Reverse Logistics Process Flow
 - Process Elements
- DOD High Risk Improvement Plan
 - Performance Measures
 - Notional Discussion on Best-in-Class Metrics
- Reverse Logistics & Partnerships

Differences Between Forward and Reverse Logistics

FORWARD LOGISTICS

- Forecasting straightforward
- One-to-Many distribution points
- Uniform product quality
- Uniform product packaging
- Destination / routing clear
- Dispositions option clear
- Uniform pricing
- Forward distribution costs visible
- Consistent inventory management
- Product life cycle manageable
- Negotiation between parties straightforward
- Marketing methods well known

REVERSE LOGISTICS

- Forecasting difficult
- Many-to-One distribution points
- Product quality uncertain
- Product packaging not uniform
- Destination / routing unclear
- Dispositions option not clear
- Pricing dependent on many factors
- Return distribution costs less visible
- Inventory management not consistent
- Product life cycle issues more complex
- Negotiation between parties complicated by several factors
- Marketing complicated

- Forward Logistics: Know your customer.
- **Reverse Logistics: Know your suppliers!**
 - Reverse Logistics is not an operation of Forward Logistics
 - **DEFINITION: all activity associated with a product/service after the point of sale*. Types of activity include:**
 - » *IT process management*
 - » *Logistics & sustainment*
 - » *Spare parts management*
 - » *Obsolescence/replacement management*
 - » *Warehousing*
 - » *PHS&T*
 - » *Depot Maintenance, Repair & Overhaul*
 - » *Refurbishment (RESET, RETROGRADE)*
 - » *Recycle/Reuse/Disposal*
 - » *Call center support*
 - » *Field service*

OBJECTIVE: Achieving an affordable Materiel Availability rate of 85% (or higher).

- Material Availability -

- Measures the percentage of the total inventory of a system that is operationally capable (*ready for tasking*) of performing an assigned mission, at a given time, based on materiel condition.

$$\frac{\text{(number of operational end items)}}{\text{(total number of end items acquired)}} \quad \text{or} \quad \frac{\text{(uptime)}}{\text{(uptime) + (downtime)}}$$

- **Material Reliability (Key System Attribute - KSA):**
 - Measures the probability that the system will *perform without failure* over a specified interval.

$$\frac{\text{Mean Time Between Failures}}{\text{operating hours}} = \frac{\text{operating hours}}{\text{number of failures during operating period}}$$

- **Ownership Cost (KSA):**
 - Provides balance to the sustainment solution by ensuring that the Operations and Support (O&S) costs associated with Materiel Readiness (e.g.. maintenance, spares, fuel, support, etc.) are considered in making program decisions.
 - Ultimately based on O&S Cost Estimating Structure elements

Reverse Logistics Challenges

- **Uncertain timeline - Demands based on customer-driven events, not production schedules.**
 - Juggling act with PPBES process
- **Uncertain quantities - Returns based operating environment: GWOT, training, etc.**
 - no steady-state demand forecasting.
- **Uncertain condition - the assets are being returned due to an undetermined operational or maintenance problem**
 - many returned assets having no evidence of failure.
- **SOR may not be the OEM**
 - Sustainment data may be unavailable, inaccurate, or incomplete
- **Utilizing a revolving fund financial management structure (Defense Working Capital Fund) for full cost recovery of products and services rendered.**

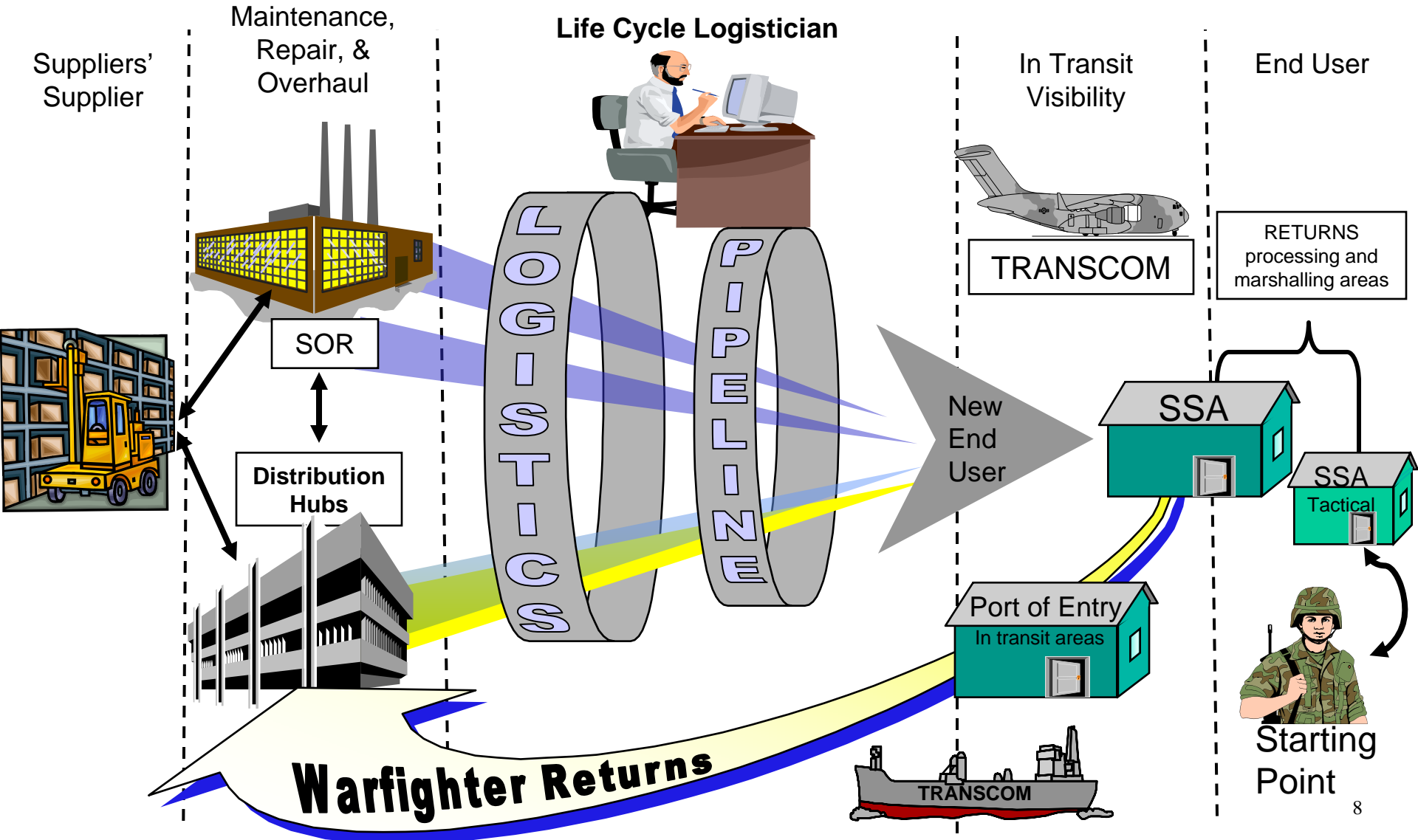
Reverse Logistics Opportunities

- **Reverse Logistics is a significant business opportunity**
 - A \$35B+ growth industry for 2008
- **A large number of DOD clients have a big need and a lot of pain**
 - OEM's and Warfighters struggle with handling GWOT Returns
 - *RETROGRADE, RESET, RECAP*
 - Often viewed as a non-strategic part of business base
- **Business opportunities are often within current capabilities**
 - complementary to many of the forward logistics process and services you are performing today.
 - *Low cost of entry when utilizing existing facilities and staff to maximum extent possible.*
- **Profitable customers**
 - ALL Warfighters and manufacturers have to deal with maintenance, repair, overhaul, and upgrades.
 - *So many need help, that the ones where you can make the largest beneficial impact (such as high volume, high value returned goods) are readily identifiable.*
- **Few Competitors**
 - There are few companies providing sophisticated, cost effective Reverse Logistics services, especially within DOD.
 - *This translates into better margins.*

Reverse Logistics has many implications:
RESET, RETROGRADE, Requisitions, Returns, etc.



Reverse Logistics Process Flow



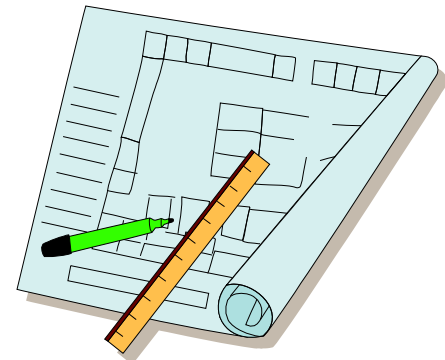
Returns Processes

- The objective of this process is to move material from end customer back through the supply chain to address defects in product, ordering, manufacturing, or to perform upgrade activities.
- Key Return Types:
 - Defective Materials
 - *Manufacturing Defects*
 - *Ordering Defects*
 - *Delivery issues*
 - Maintenance, Repair and Overhaul (MRO)
 - *Preventative Maintenance*
 - *End-of-Life Overhaul*
 - *Breakage with use*
 - Excess Product Returns
 - *Product Retirement*
 - *Excess Channel Inventory*
 - *Unit rotation*
 - Deliver Returns (DR)
 - *From the Warfighter to the CONUS Distribution hub*
 - Source Returns (SR)
 - *From the Source of repair to suppliers*

MRO is a significant part of RESET

Maintenance, Repair, and Overhaul Process

- **MRO Objective:**
 - The logistics & sustainment processes of adding value to products already in the DOD inventory, focused on improving materiel availability.
- **Key Processes Comprehended:**
 - Schedule production, request and receive material from suppliers
 - Manufacture, repair, upgrade, test, assemble, package, hold/release product to distribution hub.
 - *RESET, RETROGRADE, RECAPITALIZATION*
 - Engineering changes, facilities and equipment, production status, quality, workflow and capacity management
 - Manage WIP inventories



DOD High Risk Improvement Plan*

- **DOD's Supply Chain Management High Risk Improvement Plan includes four high-level performance measures that are being tracked across the department, as follows:**
- Backorders
 - *Number of orders held in an unfilled status pending receipt of additional parts or equipment through procurement or repair.*
- Customer wait time
 - **Number of days between the issuance of a customer order and satisfaction of that order.**
- On-time orders
 - **Percentage of orders that are on time according to DOD's established delivery standards.**
- Logistics response time
 - **Number of days to fulfill an order placed on the wholesale level of supply from the date a requisition is generated until the materiel is received by the retail supply activity.**

Just a thought: Why aren't they tracking & measuring cost?

Metrics & Measures - Definitions

Metric: “a standard for measurement ”

- **Reverse Logistics needs operational metrics linked to business objectives**
 - Highlights the gap in performance
- **Standardized metrics allow “apples to apples” benchmarking (across companies, partnerships, and industries)**
 - Change over time is more valuable than a single sample

Measurement: “an observation that reduces the amount of uncertainty about the value of a quantity ”

- **Pure measures – time, cost, # of orders, # of shipments**
 - *Uses IT systems to find data for these measures*
 - *Usually most valuable to look at problems quickly*
- **Yield measures – fill rate, perfect order delivery, labor efficiency, forecast accuracy**
 - *More complex, having many nonlinear drivers*
 - *Exhaust pure measures before choosing yield measures (time to measure and analyze)*
 - *Highly Detailed information required*

FOR DISCUSSION PURPOSES ONLY

Metric: Adaptability

Definition: The sustainable reduction and increase in quantities that can be achieved in 30 days (without backorders, cost penalties or inventory).

Calculation: Upside: Percentage sustainable increase

Downside: Percentage sustainable reduction

- L2 Metrics:
- Downside and Upside Source Adaptability (sample)
 - Downside and Upside Make Adaptability
 - Downside and Upside Deliver Adaptability

Notes: This metric may have more than one Source-, Make- and Deliver Adaptability component depending on the complexity of the supply chain.



FOR DISCUSSION PURPOSES ONLY

Metric: Order Fulfillment Cycle Time

Definition: The average actual cycle time consistently achieved to fulfill requisitions.

Calculation: [Sum Actual Cycle Times For All Orders Delivered] / [Total Number Of Orders Delivered]

- L2/3 Metrics:
- Return Cycle Time
 - (sample) • MRO Cycle Time
 - Deliver Cycle Time

Notes: For each individual requisition, this cycle time starts from the order receipt and ends with customer acceptance of the delivery. (Includes Order Dwell Time – if measured)

* REFERENCE: DOD Instruction 4140.61 Customer Wait Time and Time Definite Delivery
December 14, 2000

FOR DISCUSSION PURPOSES ONLY

Metric: Perfect Order Fulfillment

Definition: The percentage of orders delivered on-time, in full, with complete documentation, using customer's definition of on-time and complete to determine Materiel Availability

Calculation: $[\text{Total Perfect Orders}] / [\text{Total Number of Orders}]$

- L2/3 Metrics:
- % Orders placed without error
 - (sample) • % Orders scheduled to customer request date
 - % Orders received damage free
 - % Orders with correct logistics documents

Notes: An order is Perfect (as per customers' definition of Materiel Availability) only if all L2/L3 metrics are perfect.

* REFERENCE: DOD definition for time-definite delivery (TDD) -
The delivery of requested logistics support at a time and destination specified by the receiving activity

Metric: Cash-to-Cash Cycle Time

Definition: The time it takes for cash invested in materials to flow back into the company after finished goods have been delivered to customers.

Calculation: [Inventory Days of Supply] + [Days Sales Outstanding] – [Days Payable Outstanding]

- L2/3 Metrics:
- Inventory Days of Supply
 - (sample) • Days Sales Outstanding
 - Days Payable Outstanding

Notes: For services, the time between paying the resources assigned to a service and receiving payment for the service delivery.

FOR DISCUSSION PURPOSES ONLY

Metric: Life Cycle Cost

Definition: All direct, indirect, and overhead expenses associated with the logistics & sustainment after full materiel release.

Calculation: [Cost to Plan] + [Cost to Source] + [Cost to Deliver] + [Cost to Return]

- L2/3 Metrics:
- Cost to Return
 - (sample) • Cost to Source
 - Cost to Deliver
 - Cost to Plan



Notes: The Cost to Maintain is captured in Cost of Goods Sold (COGS), however there can be overlap between COGS and Supply Chain Management Cost.

FOR DISCUSSION PURPOSES ONLY

Metric: Cost of Goods Sold (COGS)

Definition: The cost associated with buying raw materials and producing finished goods. This cost includes direct costs (labor, materials) and indirect costs. Generally expressed as % of sales.

Calculation: Direct Material + Direct Labor + Overhead

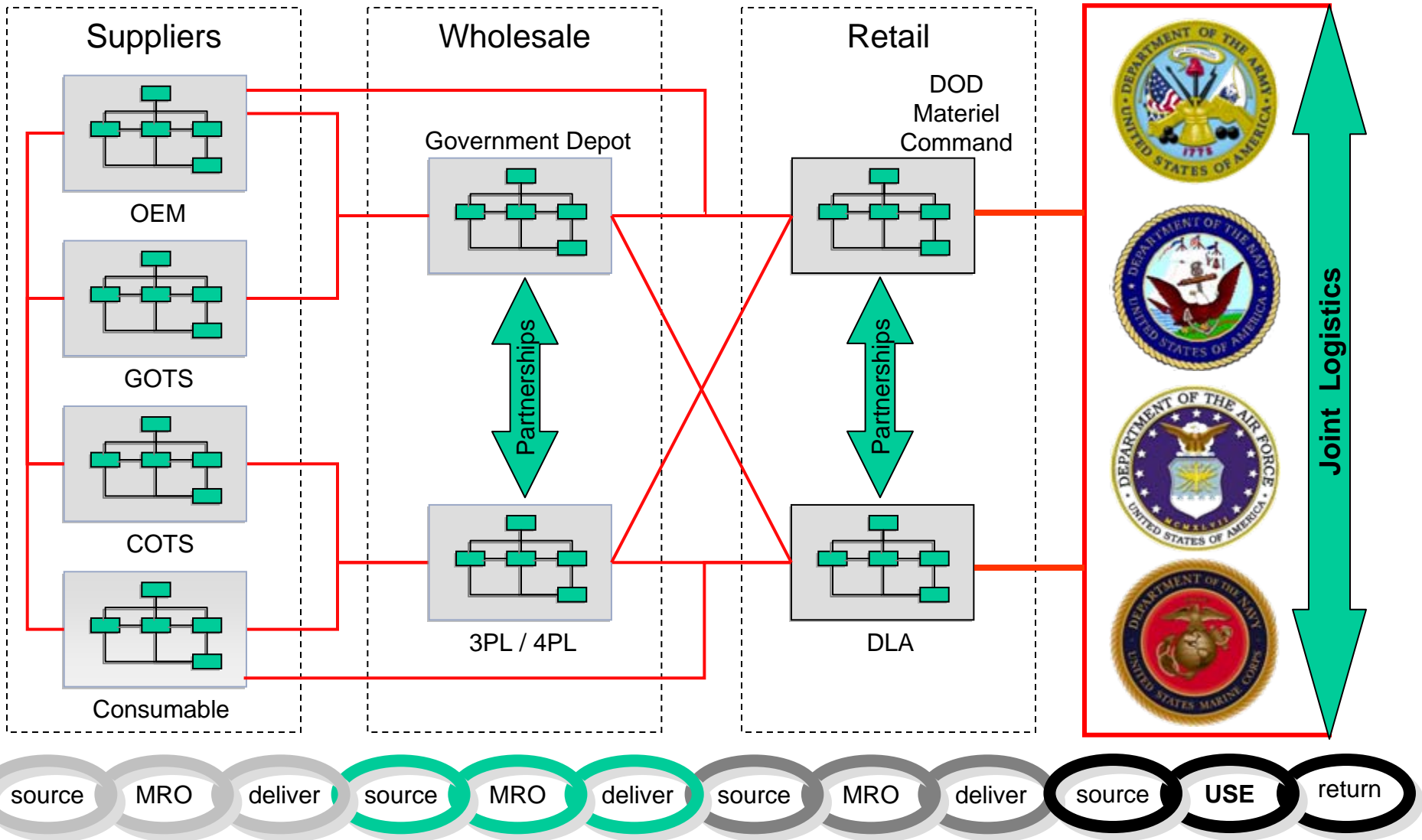
- L2/3 Metrics:
- Direct Material Cost
 - (sample) • Direct Labor Cost
 - Surcharges

Notes: Overhead may contain elements of the Defense Working Capital Fund that has been allocated to MRO related processes.



-  Total Ownership Cost Component
-  Cost of Goods Sold component

In Closing - It Is Always About Partnerships!



THANK YOU!

Behind every great leader there was an even greater logistician. - M. Cox



**Behind every great logistician there is a well-defined process.
– J. Sells**

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