

Redis Data Structures

1. Current Driver Sessions

Redis Data Structure: Hash

- Key Format: ``session:driver_id``
- Value: A hash where each field represents a session attribute (e.g., ``lastActive``, ``currentRoute``, ``isLogged``).
- Example Command: ``HSET session:123 lastActive 1617998437 currentRoute 45 isLogged 1``

Purpose:

Using a hash for each driver's session allows storing multiple related pieces of information about the driver's session in a structured format that is easy to access and modify. Each ``driver_id`` will have its associated session hash, and operations like updating the last active time or changing the current route can be efficiently performed with simple hash operations.

2. Real-Time Route Tracking

Redis Data Structure: Sorted Set

- Key Format: ``routeTracking``
- Members: ``route_id``
- Score: Current timestamp or progress metric (like distance completed).
- Example Command: ``ZADD routeTracking 1618000000 route45``

Purpose:

A sorted set is ideal for tracking routes in real-time because it allows the system to maintain a dynamically ordered set of routes based on a scoring system that could represent the time or completion percentage of the route. This structure facilitates quick retrievals of the least or most progressed routes and enables efficient updates as drivers progress.

3. Performance Metrics Cache

Redis Data Structure: Hash

- Key Format: ``performance:driver_id:date``
- Value: A hash where each field represents a performance metric (e.g., ``stopsCompleted``, ``packagesDelivered``, ``timeEfficiency``).

- Example Command: `HSET performance:123:2021-04-10 stopsCompleted 12 packagesDelivered 120 timeEfficiency 0.95`

Purpose:

Storing daily performance metrics in a hash keyed by both `driver_id` and `date` ensures that data is compartmentalized by day and driver, making it easy to access and update individual performance metrics. This method is beneficial for end-of-day calculations and real-time updates during shifts, providing fast access for reporting or immediate feedback mechanisms.