```
bool try_pop (T& v)
{
    for (;;)
    {
        size_t current_pending = pending_head.load (std::memory_order_acquire);
        size_t current_tail = tail.load (std::memory_order_acquire);

        if (current_pending == current_tail) // empty
            return false;

        size_t index = current_pending & (capacity - 1);

        // Try to claim this slot atomically
        if (pending_head.compare_exchange_weak (current_pending, current_pending + 1,
                                                std::memory_order_acquire,
                                                std::memory_order_relaxed))
        {
            // Successfully claimed the slot, now read the data
            v = data[index];

            // Now we need to commit this read
            // Wait until it's our turn to commit (all previous reads have committed)
            for (;;)
            {
                size_t expected_committed = current_pending;
                if (committed_head.compare_exchange_weak(expected_committed,
                                                         current_pending + 1,
                                                         std::memory_order_release,
                                                         std::memory_order_relaxed))
                {
                    // Successfully committed
                    return true;
                }

                // If CAS failed, it means we're not next in line yet
                // Keep spinning until committed_head catches up to our position
            }
        }

        // CAS failed, another consumer claimed it. Retry.
    }
}
```

```
private:
    size_t capacity = 0;
    alignas(hardware_destructive_interference_size) std::atomic<size_t> pending_head { 0 };
    alignas(hardware_destructive_interference_size) std::atomic<size_t> committed_head { 0 };
    alignas(hardware_destructive_interference_size) std::atomic<size_t> tail { 0 };
    std::vector<T> data { std::vector<T> (capacity) };
```

```cpp
bool try_pop (T& v)
{
    for (;;)
    {
        size_t current_pending = pending_head.load (std::memory_order_acquire);
        size_t current_tail = tail.load (std::memory_order_acquire);

        if (current_pending == current_tail) // empty
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        // Try to claim this slot atomically
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                                                         current_pending + 1,
                                                         std::memory_order_release,
                                                         std::memory_order_relaxed))
                {
                    // Successfully committed
                    return true;
                }

                // If CAS failed, it means we're not next in line yet
                // Keep spinning until committed_head catches up to our position
            }
        }

        // CAS failed, another consumer claimed it. Retry.
    }
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```

```cpp
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    alignas(hardware_destructive_interference_size) std::atomic<size_t> tail { 0 };
    std::vector<T> data { std::vector<T> (capacity) };
```

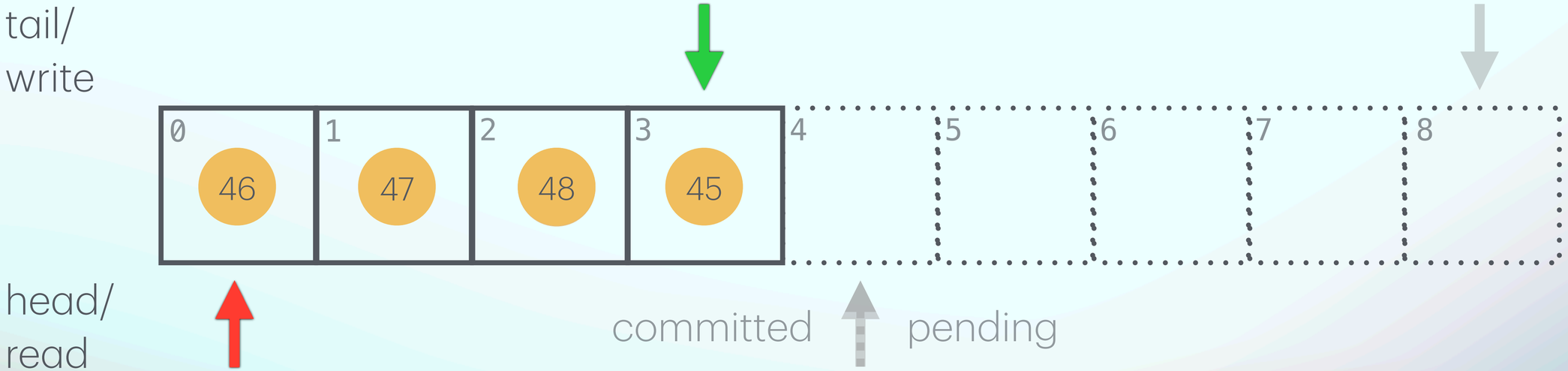
tail/
write
0
46
1
47
2
48
3
45
4
5
6
7
8
head/
read
committed
pending