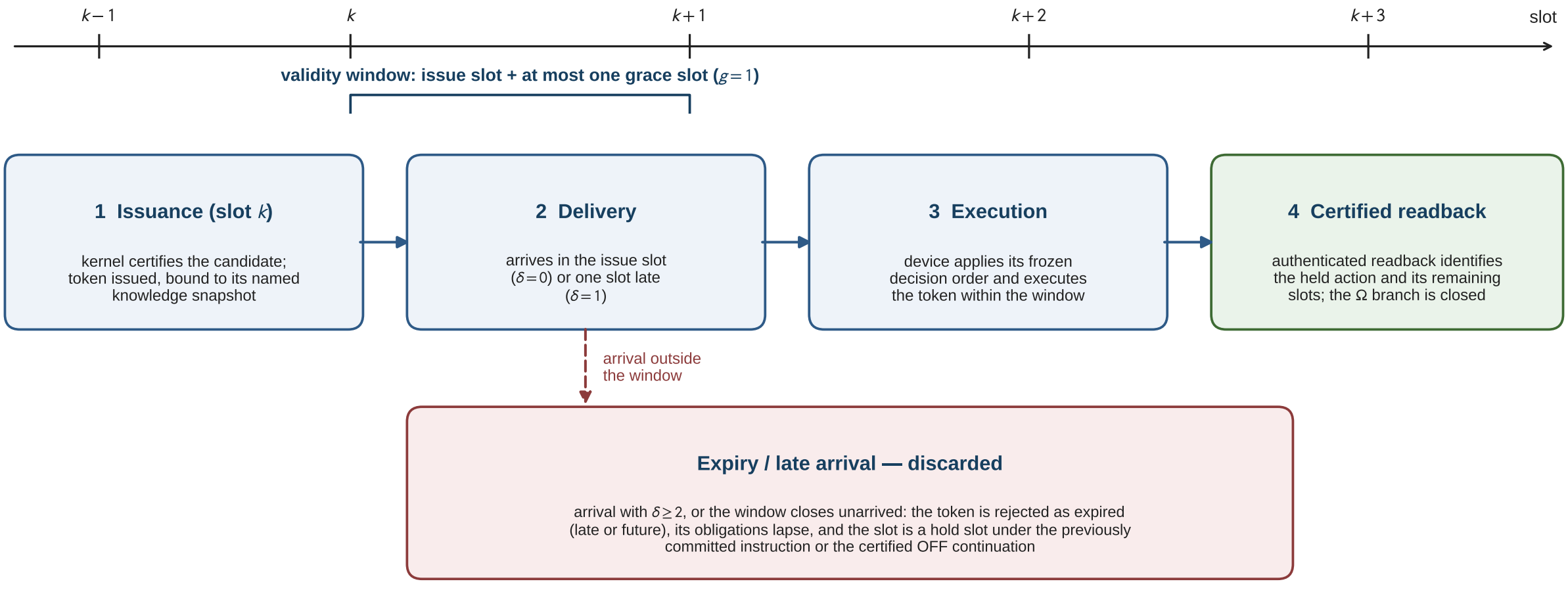

$k-1$
k
$k+1$
$k+2$
$k+3$
slot
validity window: issue slot + at most one grace slot ($g=1$)
1 Issuance (slot k)
kernel certifies the candidate; token issued, bound to its named knowledge snapshot
2 Delivery
arrives in the issue slot ($\delta=0$) or one slot late ($\delta=1$)
3 Execution
device applies its frozen decision order and executes the token within the window
4 Certified readback
authenticated readback identifies the held action and its remaining slots; the Ω branch is closed
arrival outside the window
Expiry / late arrival — discarded
arrival with $\delta \geq 2$, or the window closes unarrived: the token is rejected as expired (late or future), its obligations lapse, and the slot is a hold slot under the previously committed instruction or the certified OFF continuation