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NEW MECHANISM FOR SMART BATTERY OPERATION

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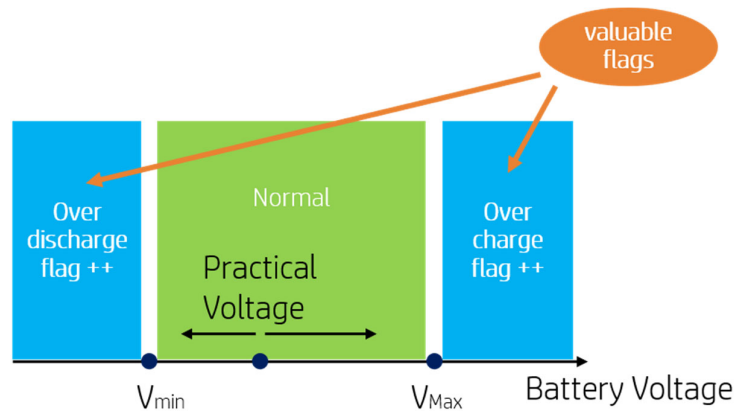
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New Mechanism for Smart Battery Operation

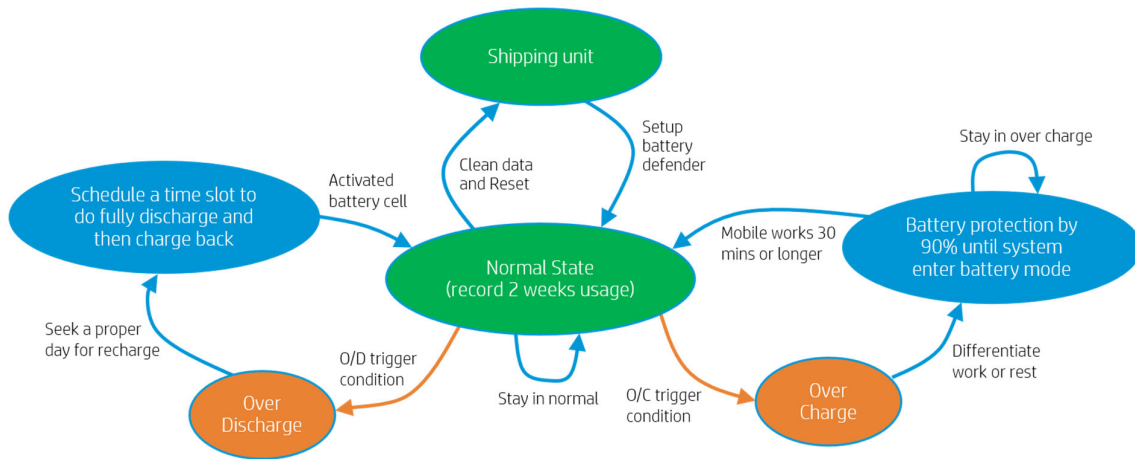
Disclosed is a mechanism to identify the user habit of battery by monitoring battery voltage and current. After classifying the user habit, we will provide different solutions for each case of users. This mechanism can find out the users in need and will not disturb all users.

Conventional Approach: In previous solution, system will limit the full percentage of battery to 90% in order to protect battery from over charge. This solution will impact the users with no different, and the battery life will be decreased due to the restriction.

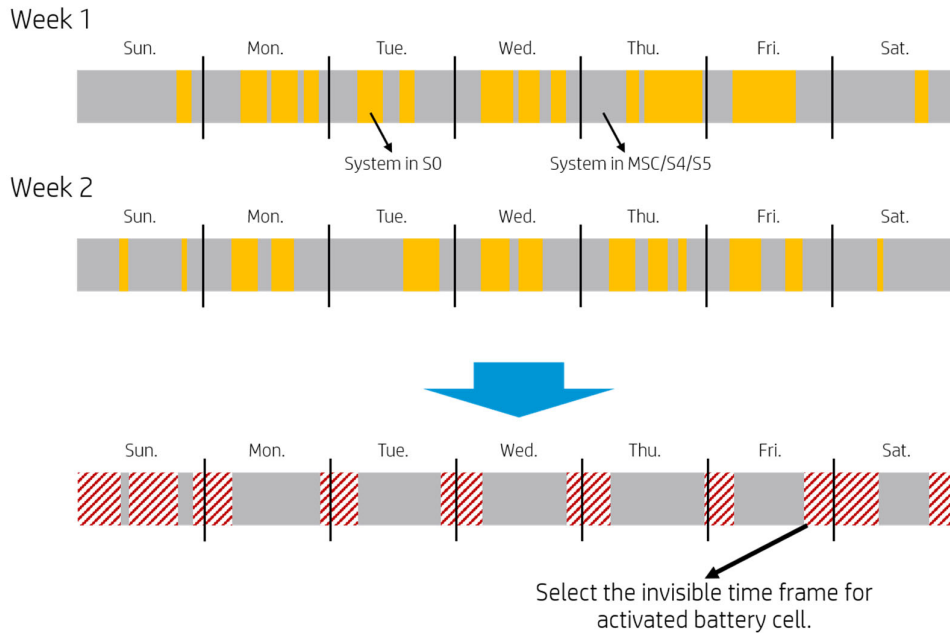
New Approach: The new method will base on the practical battery voltage to realize user habit as below. If the battery voltage is less than minimum voltage for a long time, the system will be marked as over discharged unit. If the battery voltage is always over maximum voltage with adapter, the system will be marked as over charged unit. If the battery voltage is always in normal state, the system will be marked as normal unit.



After marked the system as different label, there will have different solutions for each condition as below. For over discharged unit, system will schedule a time frame to do fully charge and discharge when the user is not using. After system finishes fully charge and discharge cycle, the label will be cleared. For over charged unit, system will limit battery capacity to 90% until user unplug the adapter for more than 30 minutes. For normal unit, system will not have any action except keep monitoring battery voltage.



The picture below is a concept of finding a time frame for over discharge unit to do a fully charge and discharge. When the unit is under normal state, system will record battery voltage and system usage time at the same time to find out the idle time of system. If the system is justified as over discharged unit, system will arrange a time slot according to the record before.



Disclosed by Angel Hsu, Wendell Lo, Rex Lin and Alex Chou, HP Inc.