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## SMART USB-C POWER SOURCE CONTROL

HP INC

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## Smart USB-C power source control

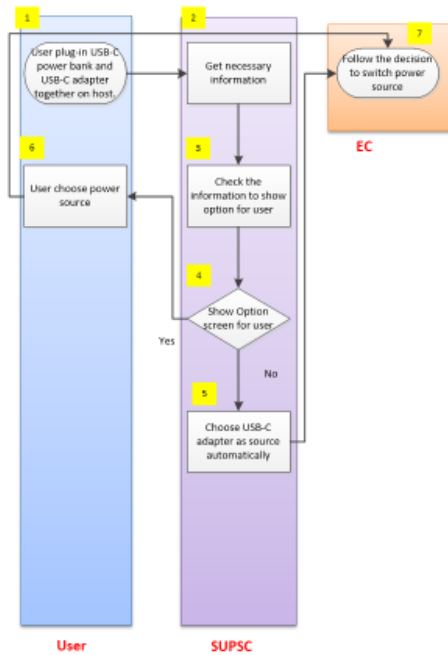
### Abstract:

The power source can be battery, USB-C adapter and USB-C power bank on NB. User may plug-in USB-C power bank and USB-C adapter together on host. In normal design, host will choose the power source from USB-C adapter and charge the USB-C bank and battery. But users may want to have capability to choose the power source. User may want to choose power source from USB-C power bank because the output capacity of power bank is higher. The system can have better performance with higher capacity power source. We provide a Smart USB-C Power Source Control(SUPSC). It will consider the system requirement and then help user to choose the power source. Users can choose the power source by their request.

### Design Construction:

- HW: No addition hardware design. Standard EC controller and adapter.
- SW: Smart USB-C Power Source Control(SUPSC)
- EC: Follow the decision to switch power source. The power source is controlled by EC. SUPSC will notify the EC to switch power source by decision

< Flow Chart and Block Flow Diagram >



User plug-in USB-C power bank and USB-C adapter together on host. (assume USB-C power bank and USB-C adapter can meet minimum power requirement of host)

**Step1: User :** User plug-in USB-C power bank and USB-C adapter together on host..

**Step2: SUPSC :** Get necessary information as follows.

1. Output capacity of USB-C adapter
2. Output capacity of USB-C power bank
3. Minimum power requirement of host
4. The best performance power requirement of host

**Step3: SUPSC :** Check the information to show option for user. You can see the detail as below table. **Only show option in condition in yellow color.**

**Step4: SUPSC :** Show Option screen for user. You can see the screen in the P.6. Will provide above 4 message for user. Yes, go to Step6. No go to Step5.

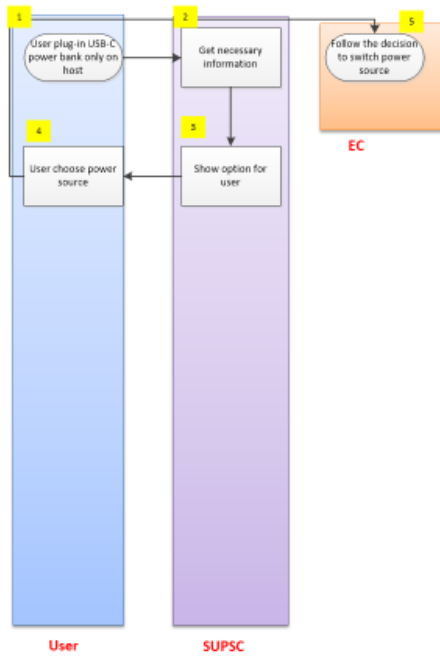
**Step5: SUPSC :** Choose USB-C adapter as source automatically. If USC-C adapter is the best choice, SUPSC will choose it automatically.

**Step6: User :** User choose power source. User can based on the message to choose the power source in the screen.

**Step7: EC :** Follow the decision to switch power source. The power source is controlled by EC. SUPSC will notify the EC to switch power source by .....

	Output of USB-C adapter larger or equal than the best performance power requirement of host	Output of USB-C adapter less than the best performance power requirement of host
Output of USB-C adapter larger or equal than Output of USB-C power bank	USB-C adapter	USB-C adapter
Output of USB-C adapter less than Output of USB-C power bank	USB-C adapter	Show option for user. User can choose the power source.

The minimum power requirement of host: 45W The best performance power requirement of host: 65W		
	Capacity	Power source from this device (User choose)
Output of USB-C power bank	65W	Yes or No
Output of USB-C adapter	45W	Yes or No



User plug-in USB-C power bank only on host. (assume USB-C power bank can meet minimum power requirement of host)

- Step1: User :** User plug-in USB-C power bank only on host.  
**Step2: SUPSC :** Get necessary information as follows.
1. Output capacity of host battery
  2. Output capacity of USB-C power bank
  3. Minimum power requirement of host
  4. The best performance power requirement of host
- Step3: SUPSC :** Show Option screen for user. You can see the screen as below table. Will provide above 4 message for user. Always show screen for user to choose the power source because we can't know user's request. We just can provide above 4 message to help user to choose the power source.
- Step4: User :** User choose power source. User can based on the message to choose the power source in the screen.
- Step5: EC :** Follow the decision to switch power source. The power source is controlled by EC. SUPSC will notify the EC to switch power source by decision.

The minimum power requirement of host: 45W

The best performance power requirement of host: 65W

	Capacity	Power source from this device (User choose)
Output of USB-C power bank	45W	Yes or No
Output of host battery	65W	Yes or No

- **Business Strategy/Advantages**

1. SUPSC will consider the system requirement and then help user to choose the power source automatically in some conditions. SUPSC will also show more information for user as follow. Users can consider the information to choose the power source by their request.

Output capacity of USB-C adapter

Output capacity of USB-C power bank

Output capacity of host battery

Minimum power requirement of host

The best performance power requirement of host

2. No addition hardware design and easy to implement in current system

*Disclosed by Yi-Fan (Rick) Hsia, BeBe Lai and Patrick Chen, HP Inc.*