

Moore's Law stated that transistor density would double every 2 years, this exponential growth on transistor density should lead to an exponential growth in processor speed. This transistor density growth stopped happening a few years ago due to issues like:

1. Transistors consume power when they switch, as more and more transistors are packed in small volumes, more power is consumed, more and more heat is generated by CPU cores, leading to high temperatures and dissipation problems.
2. Even though the voltage difference for on and off states (say 5 V and 1 V vs 1.8 V and 1 V) has lowered, there's a voltage threshold that can't be surpassed.
3. As transistors get closer and closer, noise problems start to appear
4. Finally, there's leakage power: transistors consume power even when they're doing nothing (i.e. not transitioning from one state to another)