Moore's Law is the observation that transistor density would double every 2 years. Moore's Law has discontinued from being true because as you put more transistors on a chip it increases power consumption. We have run into a power wall. High power leads to high temperature which means we have to have the cooling that is capable of cooling the processors. So we are at a limit where we can only dissipate a certain amount of heat. The dynamic power equation: $P = \alpha * CFV^2$ If we have a good system then our percent of time switching should be high which leads to higher dynamic power. The capacitance will go down as the transistors shrink, which means this will help reduce dynamic power. F is the clock frequency which you could make it go up if you are using an application which is computationally intensive which will increase dynamic power. V is the voltage swing from high to low and because it's squared this is the variable you want to reduce in order to reduce dynamic power. As we have reduced the transistor size in order to increase transistor density, we can use Dennard Scaling to reduce the voltage. Dennard Scaling means that the voltage should scale with transistor size. This can help keep power consumption and temperature low. However the problem is that the voltage on the transistor can't go too low. The transistor must stay above the threshold voltage. Now as we shrink the transistor we can manipulate the threshold voltage but it can only go physically so low. We'll also start to have noise problems as we reduce the voltage which means that it'll be harder to find the errors in the system because our voltage swings will be too low. This means we can't recover from the error and we become less noise tolerant. We also have to take into account leakage power. The transistors will leak power even when they are not switching causing the power consumption to go up. This leakage power has increased over time. This is the reason why they say we are at a power wall. If we get the processors to run any faster, then the temperature is going to go so high that it will cause the processors to melt. This is the reason why Moore's Law has stopped being true.