1. Why did you read the paper — what information were you most interested in (hint, look at the lecture topic and think of the context of the class and the fact that it’s architecture)?

The first paper gives us insights about the effect of architectural block placement on the chip and the effect of technology scaling on the wire parameters like resistance, capacitance, inductance, bandwidth, delays for different kinds of on-chip wires.

The second paper highlights the bandwidth wall; where on-chip bandwidth capability is growing faster than off-chip bandwidth. The paper provides a solution to improve the off-chip connection bandwidth.

1. What are the 4 most important things you learned?

* The paper deals with the calculation of wire metrics, like resistance, capacitance, inductance, delays and bandwidth.
* The paper also deals with how these metrics are affected by the technology scaling.
* It also discusses the architectural considerations that have to be made to reduce the effects of technology scaling on the wires.

1. Do global wires offer higher bandwidth than intermediate wires?

Yes, they offer more bandwidth.

1. Which wires scale with technology and which don’t?

Wires that connect gates locally within the blocks, they get shorter as the devices get smaller. These wires have both resistance and capacitance multiplied by the length scaling factor.

Wires that connect blocks together, they do not shrink with the technology.

1. What is the “wire problem”?

The wires need to communicate to more and more gates as the technology scales, and the wires are not able to keep up with the scaling delays of gates. With the technology scaling, the wires get slower and the increase in number resulting in wire problems.

1. How are wires expected to behave in terms of bandwidth and latency?

The bandwidth of the wires increase with the technology scaling.

The wires that scale in length with the technology, their delay also scales with technology.

The wires that do not scale in length with the technology, their delay roughly doubles with each generation of technology.