Lecture 24: Register Transfer Level

Devices
  ↓
Circuits
  ↓
Microarchitecture

Register Transfer Level

Transfer of values between registers, or into & out of a register

Representation of data flow. Register transfer level commands:

* e.g.: Add 2 n-bit numbers A, B and store value in register R1
e.g. \text{nan} 
\text{register R1}

R1 \leftarrow A + B
R1 \leftarrow R2 + R3
R1 \leftarrow R2

How do we connect registers?
Can we do any better?

Tri-state buffer
### Enable Table

<table>
<thead>
<tr>
<th>Enable</th>
<th>In</th>
<th>Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>?</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>?</td>
</tr>
</tbody>
</table>

- **High Impedance State**:

- **Buffer**
  - **Enable** = 0: Disconnects output from input.
Bus: Set of pathways shared by multiple data sources
Bus: Set of pathways shared by multiple data sources & destinations