Course II:

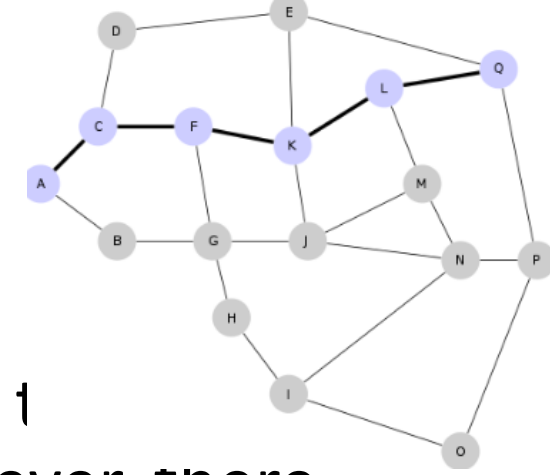
DeFi Primitives

4. Joining the World of DeFi

(ii) Blockchain Tech Big Picture

e) Incentives, Latency, Data, Computing Power

Tech Big Picture



- **Incentives**: In Proof-of-Work systems, miners are incentivized t
  transactions and to do the work that allows new blocks. However, there is no incentive to run a node.
  - It is possible to introduce incentives for Level 2 systems (Lightning Network for bitcoin)
  - Some newer technologies incentivize nodes

Tech Big Picture

- **Latency**: Blockchains have complete redundancy. How can blockchains compete with Visa with 24,000 transactions per second – and go beyond as blockchain applications grow?
  - Transactions are but one level – what happens when smart contracts become more mainstream

Tech Big Picture

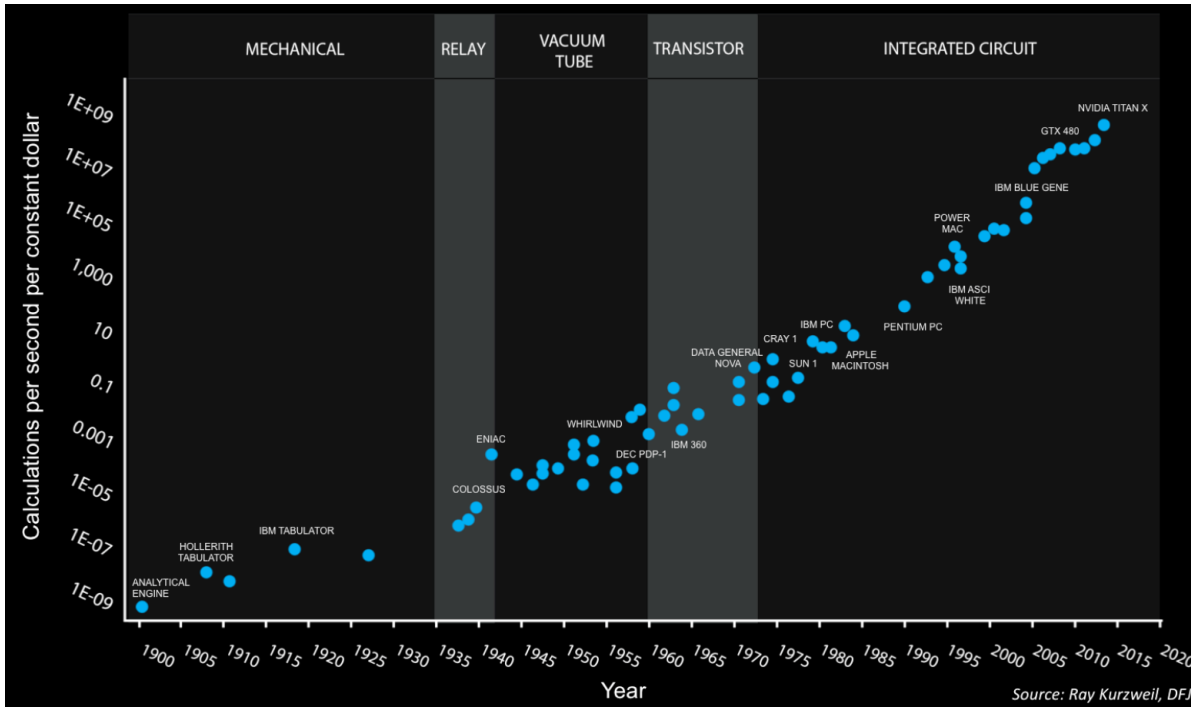
- **Data**: Blockchains are stored on multiple nodes. If large amounts of data are associated with transactions, it may be infeasible to store petabytes of data on each node.
  - Possible for blockchains to store summaries of data rather than original data
  - Cost of storage declining exponentially

Cost per GB

- 1981 - $300,000
- 1987 - $50,000
- 1990 – $10,000
- 1994 - $1,000
- 1997 - $100
- 2000 - $10
- 2004 - $1
- 2010 - $0.1
- 2021 - $0.01

Tech Big Picture

- **Computing power**: While Moore's Law might be near a limit, other technologies, such as quantum computing could create a structural break.
  - Threat to current digital signature algorithms



Calculations per $1 (constant)*

*Note y-axis is double exponential

Tech Big Picture

- **Application: Storing a Hash**
  - In my course at Duke University, for an assignment students deploy a smart contract and send a hash to the contract. This is the mechanical part of the assignment
  - They need to then tell me why this is useful
  - In another assignment, another smart contract is deployed and again a hash is sent to it. However, in this assignment the students can send a transaction to the contract to reassign the ownership of the hash to another address.
  - They need to tell me why this is useful