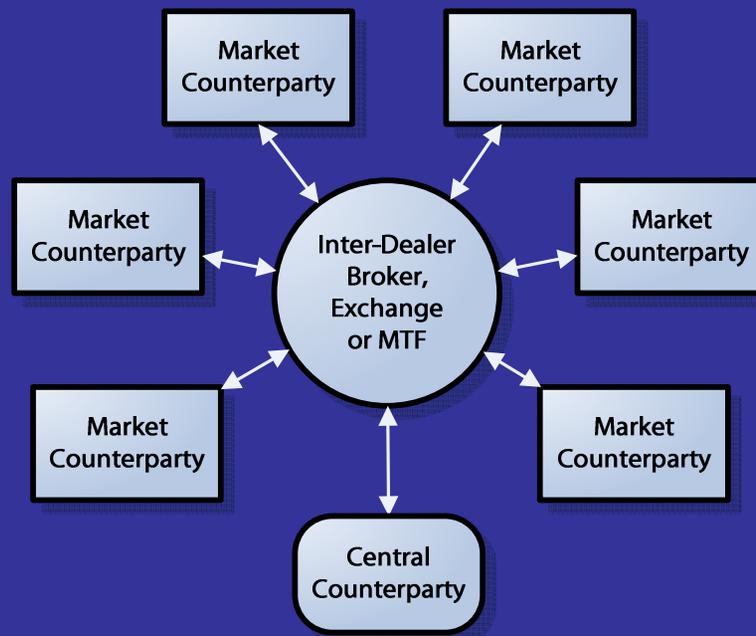# Traditional Electronic Trading Architecture

- The current approach to electronic trading is based on a centralised hub architecture

- Market counterparties contribute to and benefit from the liquidity that is concentrated at the hub

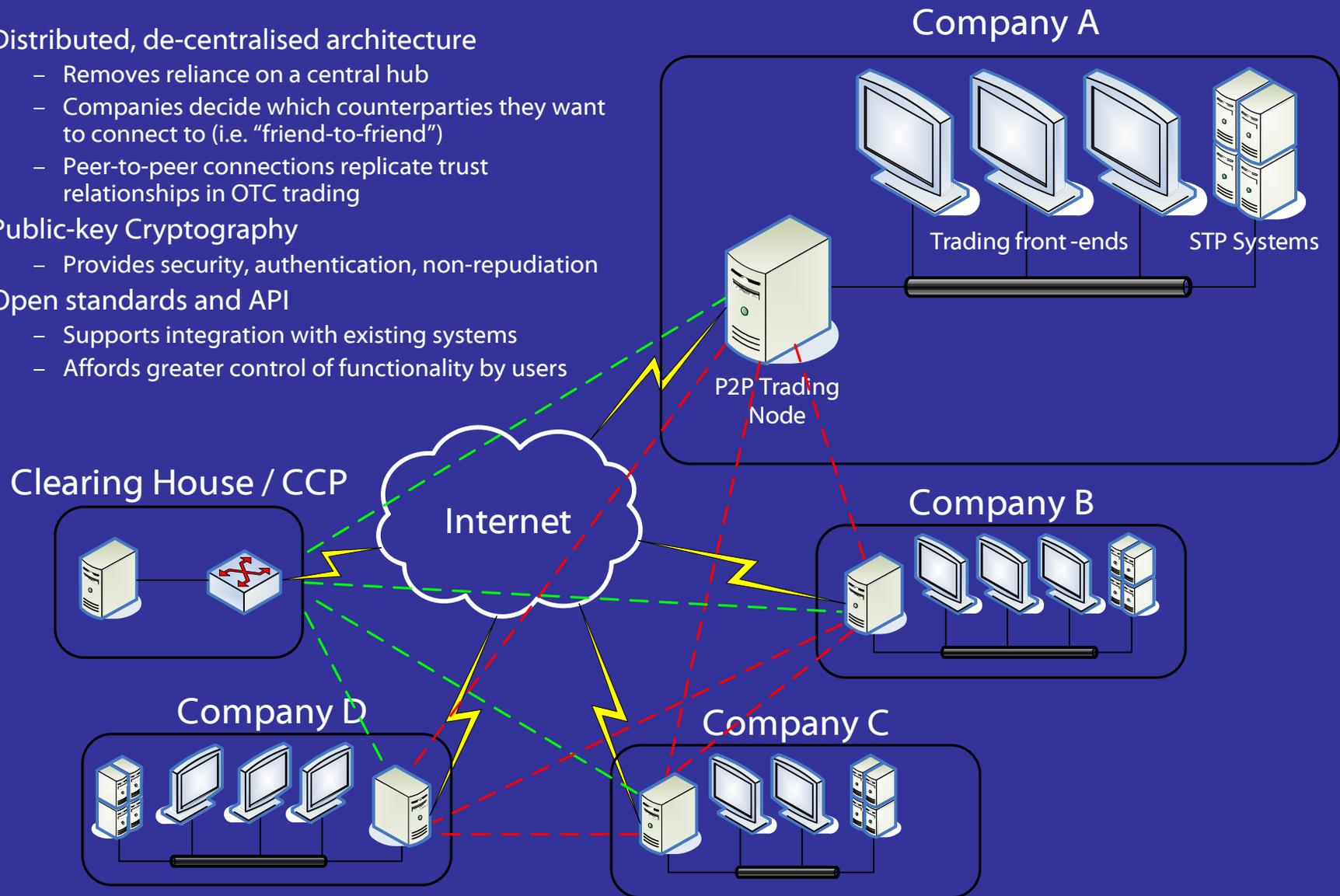- However, financial markets *used* to function more like a peer-to-peer network

Decentralised "Peer-to-Peer" Market Structure

- Before the rise of screen-based trading, liquidity was concentrated in the physical trading pits, where traders traded directly with one another

- Why not leverage peer-to-peer concepts to re-create that type of market structure by allowing market participants to connect directly to one another (and to CCPs), bypassing the middlemen entirely?
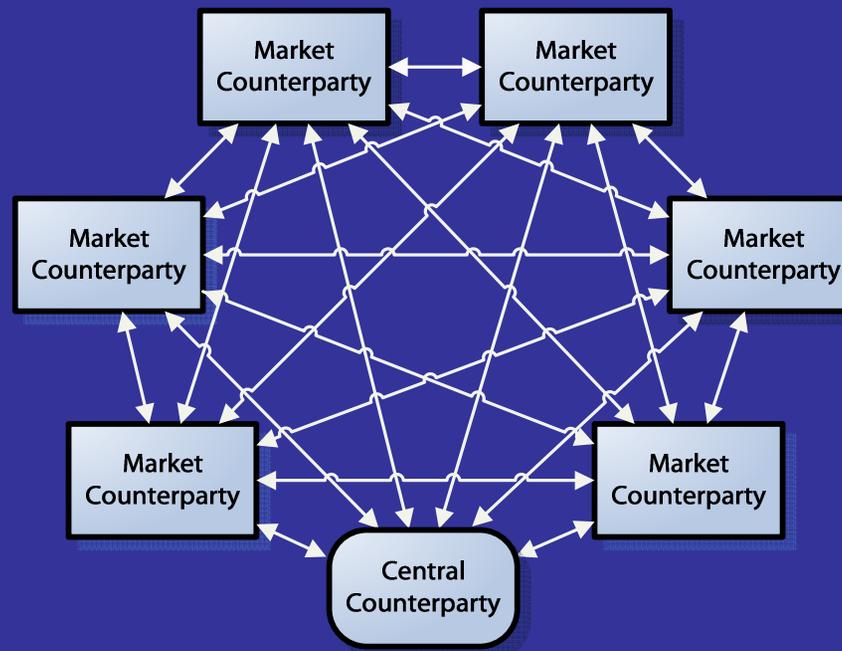
Architecture

- Distributed, de-centralised architecture
    - Removes reliance on a central hub
    - Companies decide which counterparties they want to connect to (i.e. "friend-to-friend")
    - Peer-to-peer connections replicate trust relationships in OTC trading
- Public-key Cryptography
    - Provides security, authentication, non-repudiation
- Open standards and API
    - Supports integration with existing systems
   - Affords greater control of functionality by users

Company A

Trading front-ends   STP Systems

P2P Trading Node

Clearing House / CCP

Internet

Company B

Company D

Company C

Architecture

- Counterparties only establish connections to other counterparties that they "trust" and have trading relationships with
  - Technically "Friend-to-Friend" rather than "Peer-to-Peer"

- Counterparties control who they send individual orders/axes/RFQs to

- Leverage existing, tried and tested crypto technologies (e.g. TLS, SSL) to provide security and message-signing for non-repudiation

- Architecture allows for a third party to act as an intermediary, providing anonymity and facilitating novation, if required

- Instrument definitions can be either third-party (e.g. ISINs) or a custom definition that both counterparties agree on (e.g. FpML, ISDA contracts)
  - Option of leveraging PKC to allow CCPs to "sign" instrument definitions to certify that they are supported

- A co-ordinated post-trade feed supports seamless, break-free integration with trade capture, risk management and auto-hedging systems and clearing houses or other CCPs
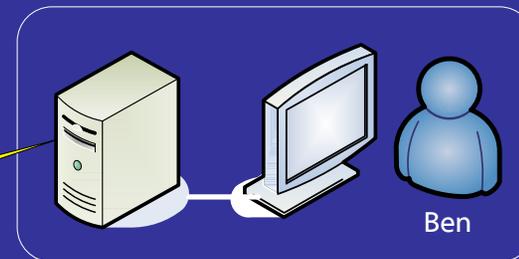
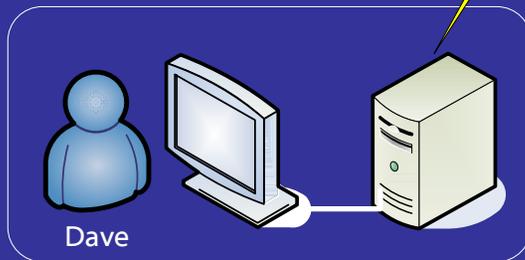# How it works

Company A

Adam

GUI

RFQ

Trading Node
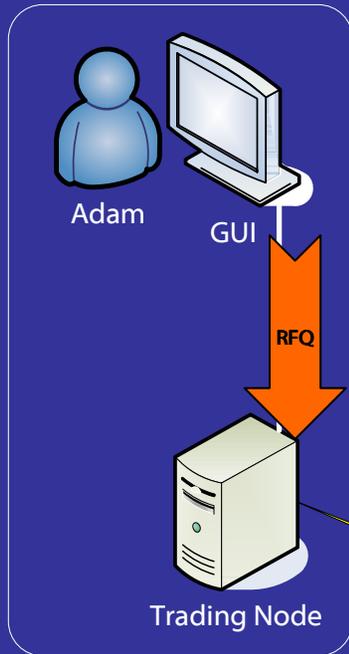
- Adam at Company A decides he wants to sell his holding of $10m ACME Corp bonds
- He brings up his client and prepares an RFQ with the relevant details (instrument ISIN and nominal amount)
- He selects which counterparties he wants to send the RFQ to from a list and hits Submit, which sends the RFQ to Company A's trading node
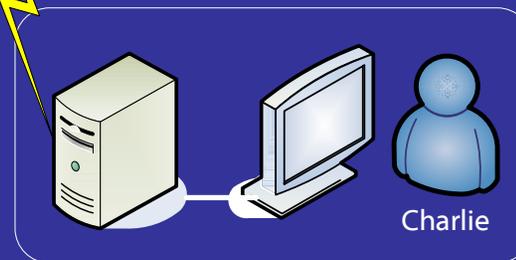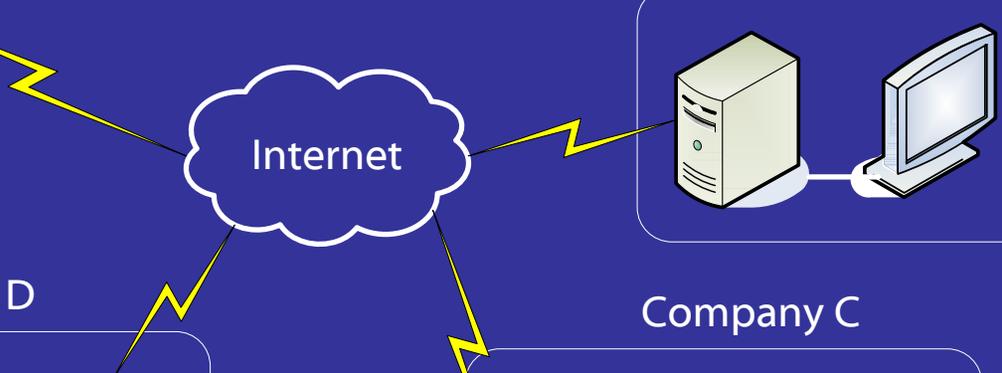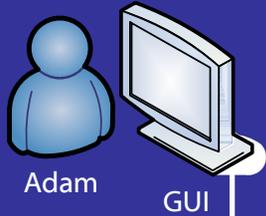
Company B

Ben

Internet

Company D

Dave

Company C

Charlie

Company A

Adam

GUI

Trading Node
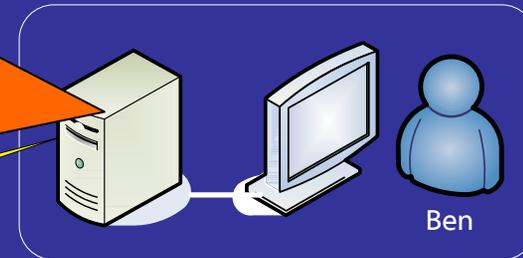
- Company A's trading node forwards the RFQ to the trading nodes at Companies B, C and D
- At each destination, the trading node routes the RFQ to the appropriate trader
- The RFQ pops up in front of Ben, Charlie and Dave - they can see that the RFQ has come from Adam at Company A but they don't know who else he has send it to
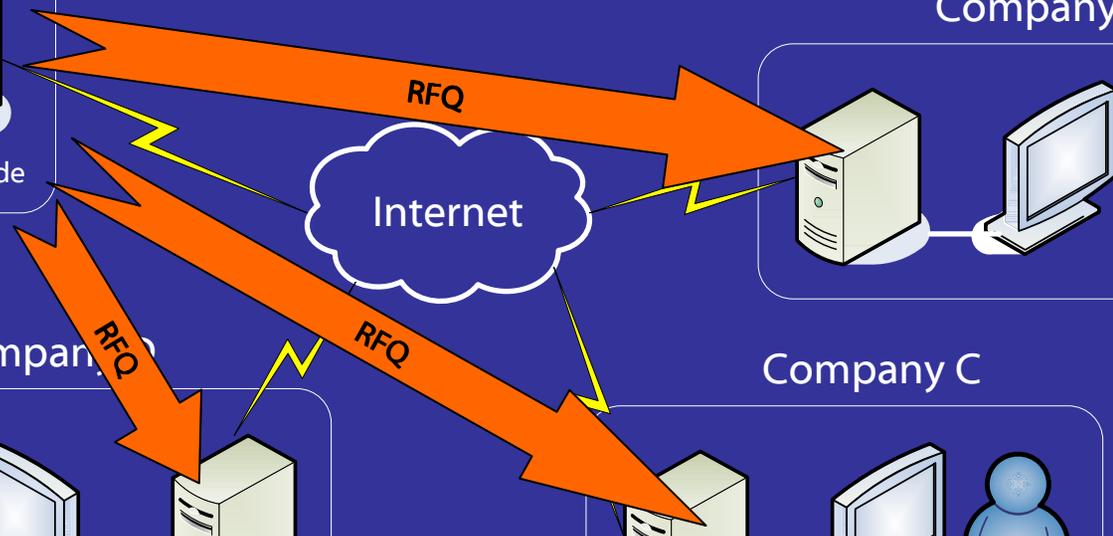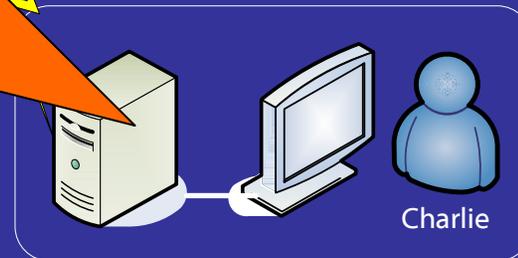
Company B
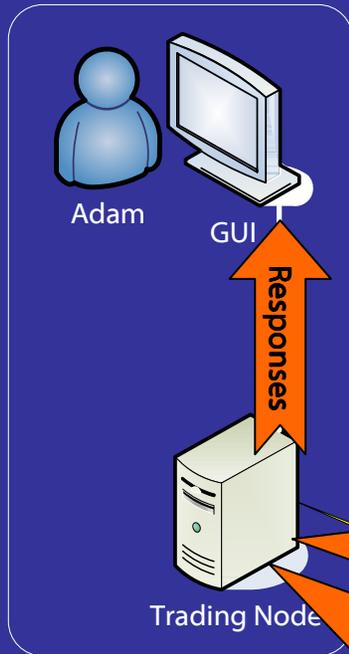
RFQ

Internet

Ben

Company D

RFQ

Dave

Company C

RFQ

Charlie

Company A
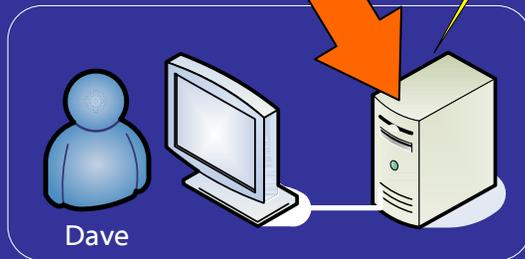
Adam
GUI

Responses

Trading Node
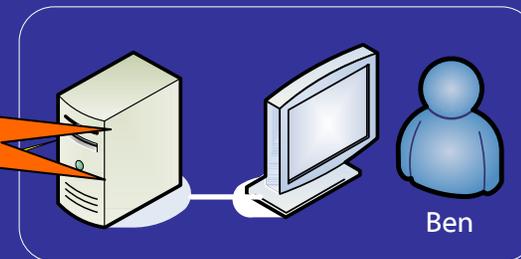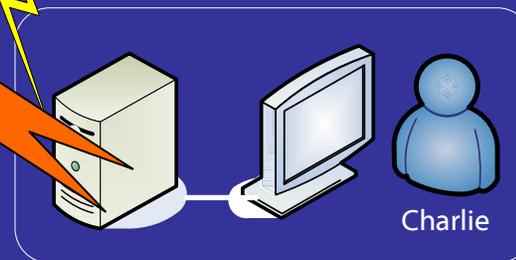
- Dave decides he doesn't want to buy ACME Corp bonds, so he ignores the RFQ
- Ben and Charlie respond with quotes which their companies' trading nodes send back to Company A
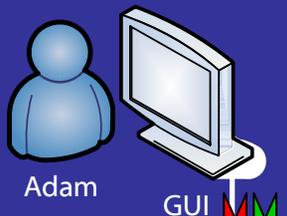- Company A's Trading Node sends the responses back to Adam's GUI

Company B

Response

Internet

Ben

Company D

RFQ Ignored
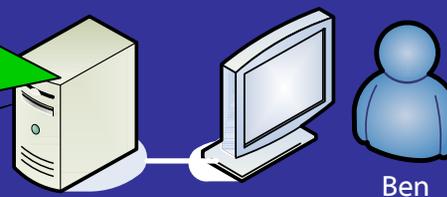
Dave

Response

Company C

Charlie

Company A

Adam

GUI

Trading Node

- After viewing the responses from Companies B and C, Adam opts to accept the quote from Company B
- Company A's trading node sends a message to Company B, indicating to Ben that the trade is Done
- Meanwhile, a 'Quote Rejected' message is sent to Company C, informing Charlie that he didn't win the deal

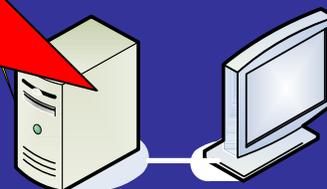**Company B**

Quote Accepted – Trade Done

Internet

Ben

Company D

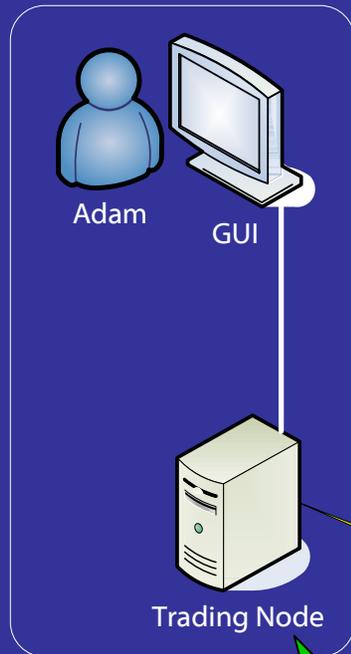Dave

Quote Rejected – Traded Away
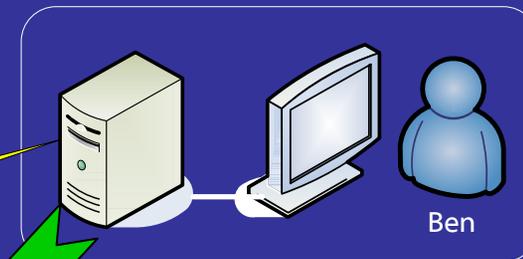
Company C

Charlie

Company A

Adam

GUI

Trading Node

- Trading Node provides a post-trade feed to internal trade capture systems
- Sends settlement instructions and trade details to a clearing house or central counterparty for matching and novation (assumes both counterparties are clearing members and are trading an approved instrument)

Company B

Ben

Internet

Post-trade

Post-trade

Clearing House / CCP

Clearing Gateway