Freechains

www.freechains.org

github.com/Freechains/README

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peer-to-peer content dissemination

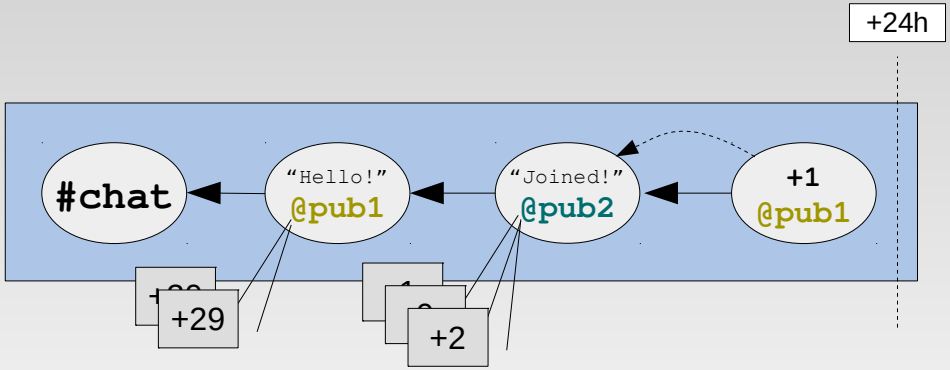
Reputation System

- Excess
  - restrict posts (quota)
  - appraise posts (likes)
- SPAM
- Fake
- Illegal
  - demand author reputation
  - account post reputation

- ✔ Fairness
  - Participants have equal opportunities to communicate
- ✔ Quality
  - Important messages are praised

Reputation System

- Likes & Dislikes → *reps*
  - Authors & Posts
- Create
  - First post → *+30 reps*
  - Consolidated posts → +1 rep
    - *>24h*, 1/day, *90 days*, max *+30 reps*
- Spend
  - New posts
  - -1 source (requires +1 rep)
- Transfer
  - Likes and dislikes
  - -1 source / ± target

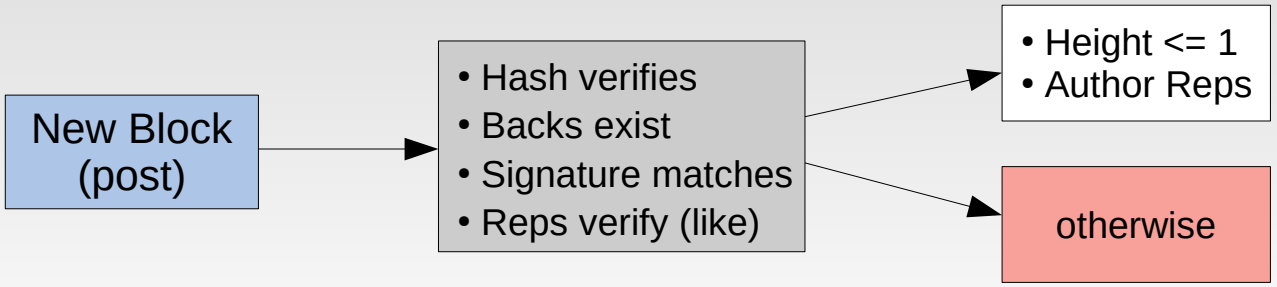


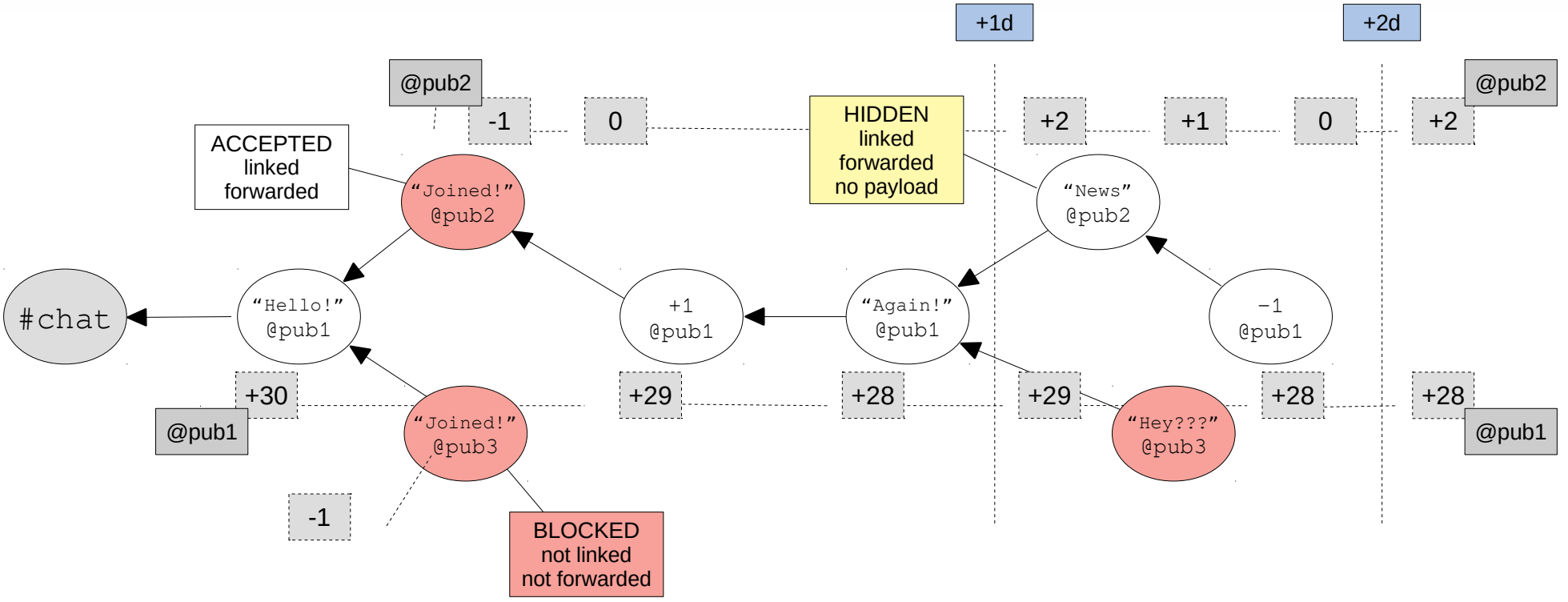

```
$ freechains chain #chat post "Hello!"  --sign=pvt1
```

```
$ freechains chain #chat post "Joined!" --sign=pvt2
```

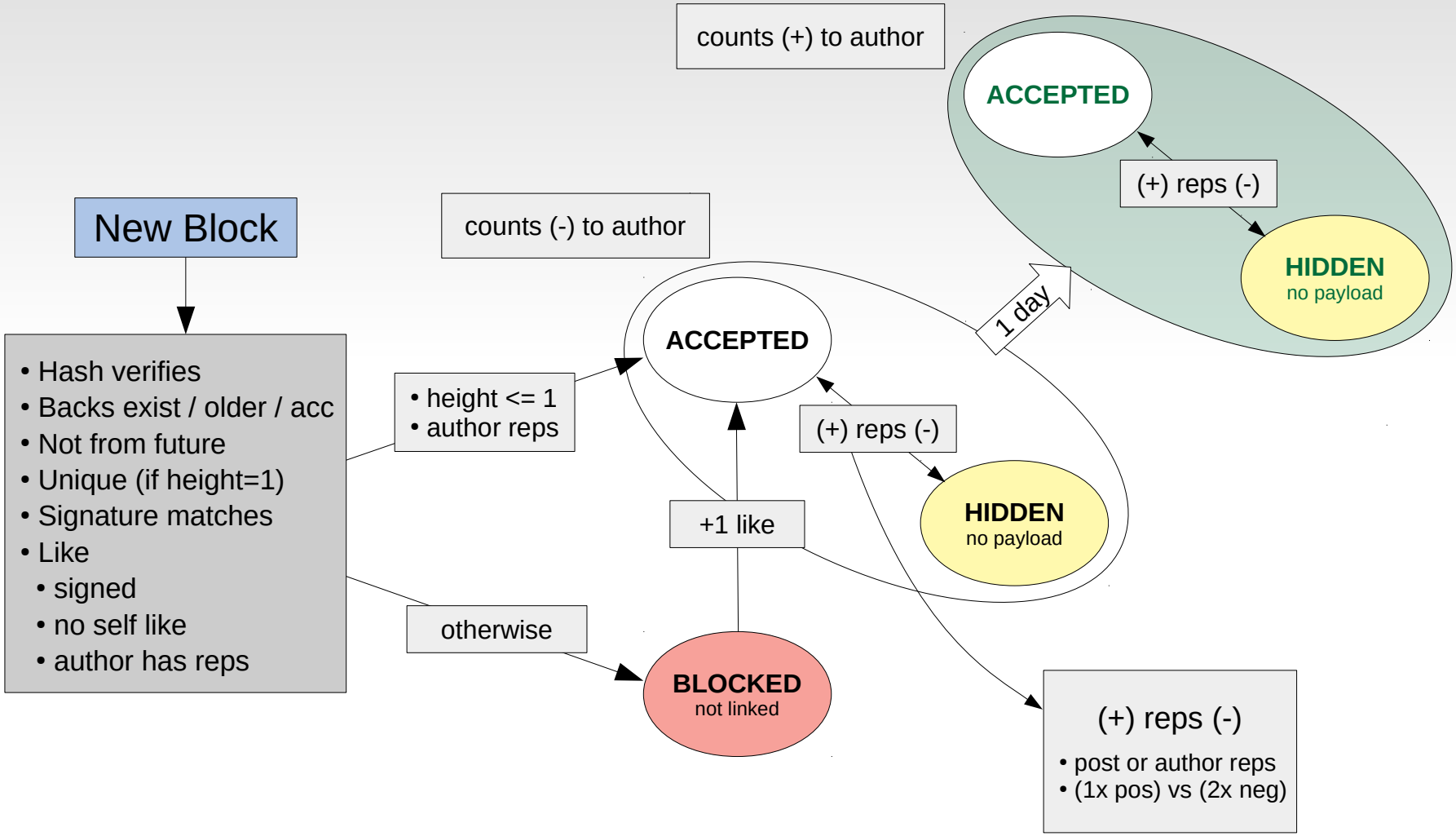
```
$ freechains chain #chat like 2_FFR8XZ  --sign=pvt1
```

Reputation System



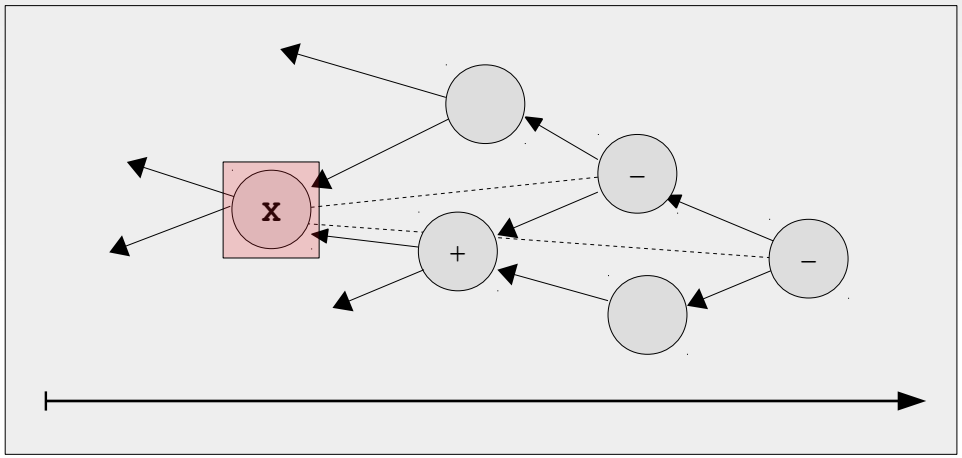


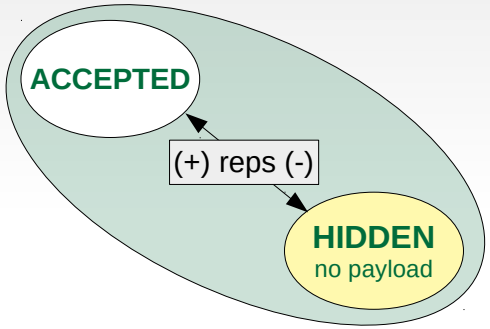
State Machine



Hidden Posts

- Cannot be removed (Merkle DAG)



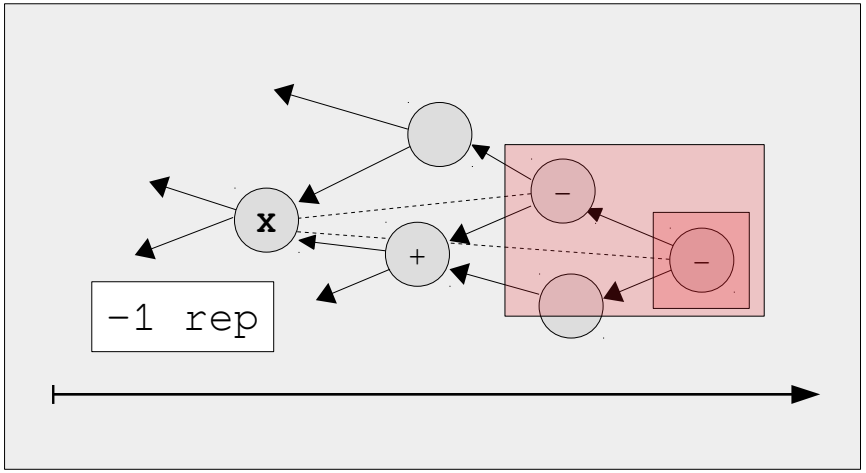



```
{
  "immutable": {
    "time": 1613001232,
    "payload": "FD7B3E..."
    "backs": [ "2_F2F4E2..." ]
  },
  "hash": "3_8EE68C...",
  "sign": { ... },
}
```

- ACCEPTED
  - demand and check payload
- HIDDEN
  - ignore payload

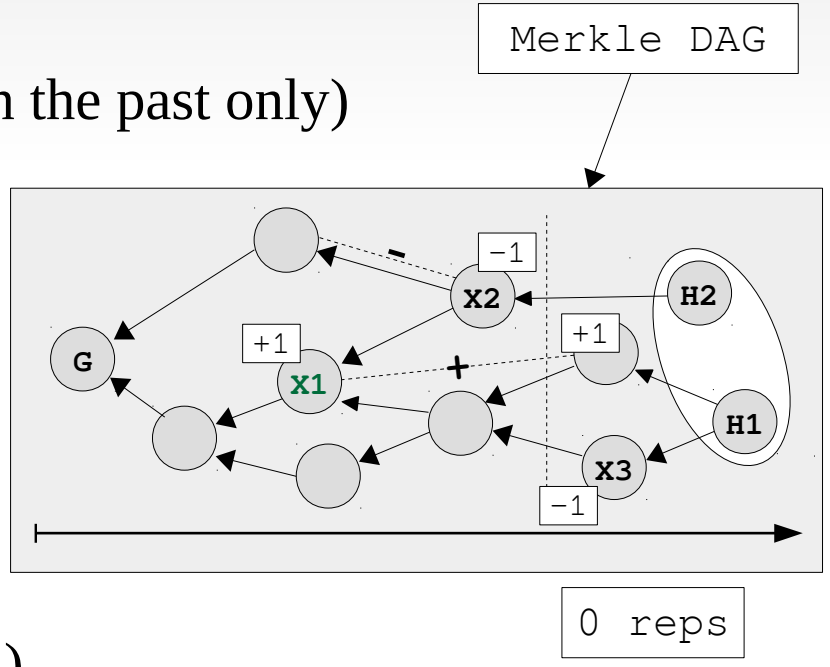
Post & Author Reps

- Post
  - counts its likes and dislikes towards heads
    - they lead back to liked block (directly or indirectly)
  - affects block perception
  - affects block state: *accepted* ↔ *hidden*
    - since depends on future, hosts may diverge temporarily



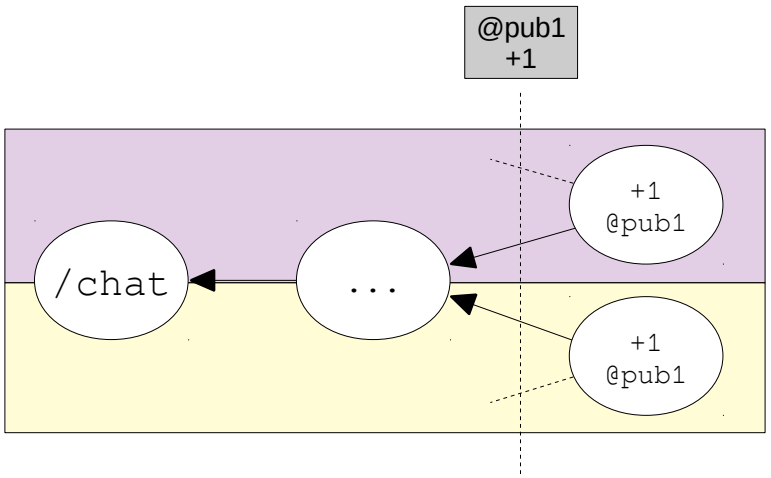
Post & Author Reps

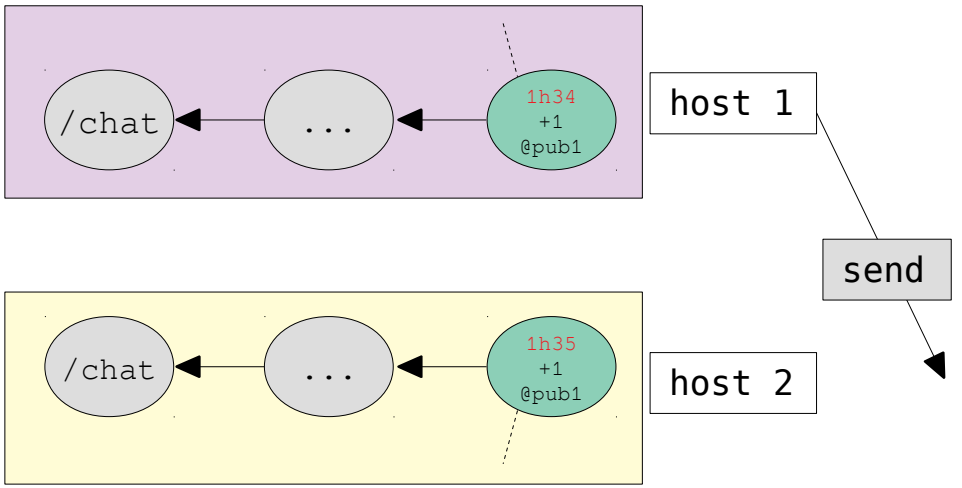
- Author
  - counts chain past back to genesis
    - starting at specific block(s) only
    - same sum anywhere (depends on the past only)
  - sum of
    - + consolidated blocks
    - received +likes and -dislikes
    - given -likes and -dislikes
  - affects
    - new post (if blocked or accepted)
      - starts at previous author's block
    - new like or dislike (if allowed or not)
      - starts at chain heads



“Double spend”

- Chains are trees...
- ...but authors’ posts must be linked lists
  - **it’s their responsibility to maintain it**
  - **forks/merges: keep largest chain (more blocks)**

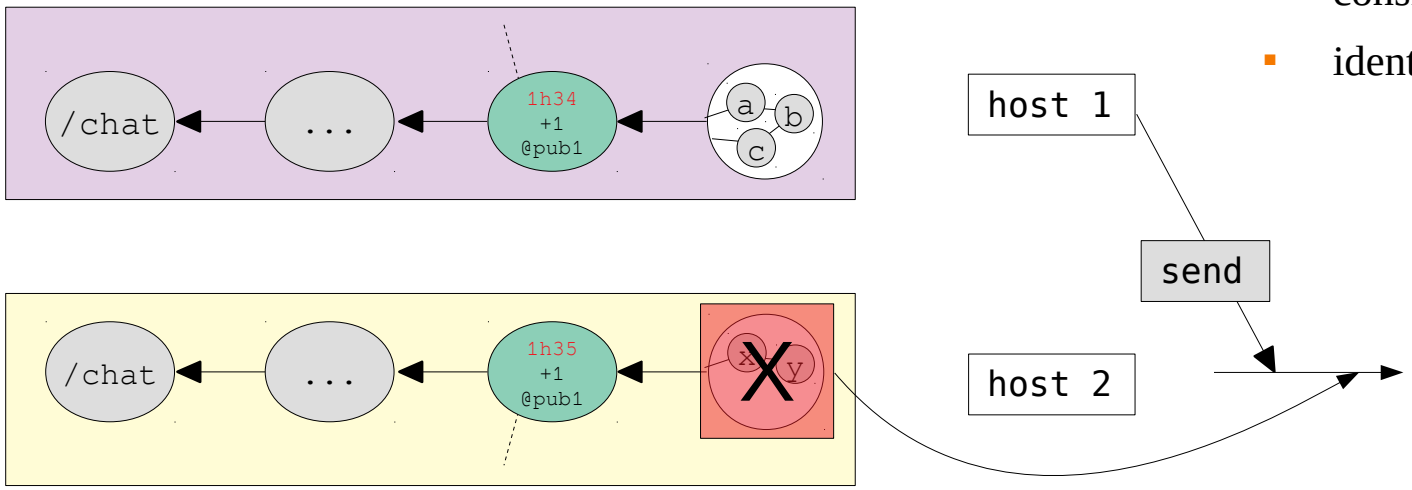




“Double spend”

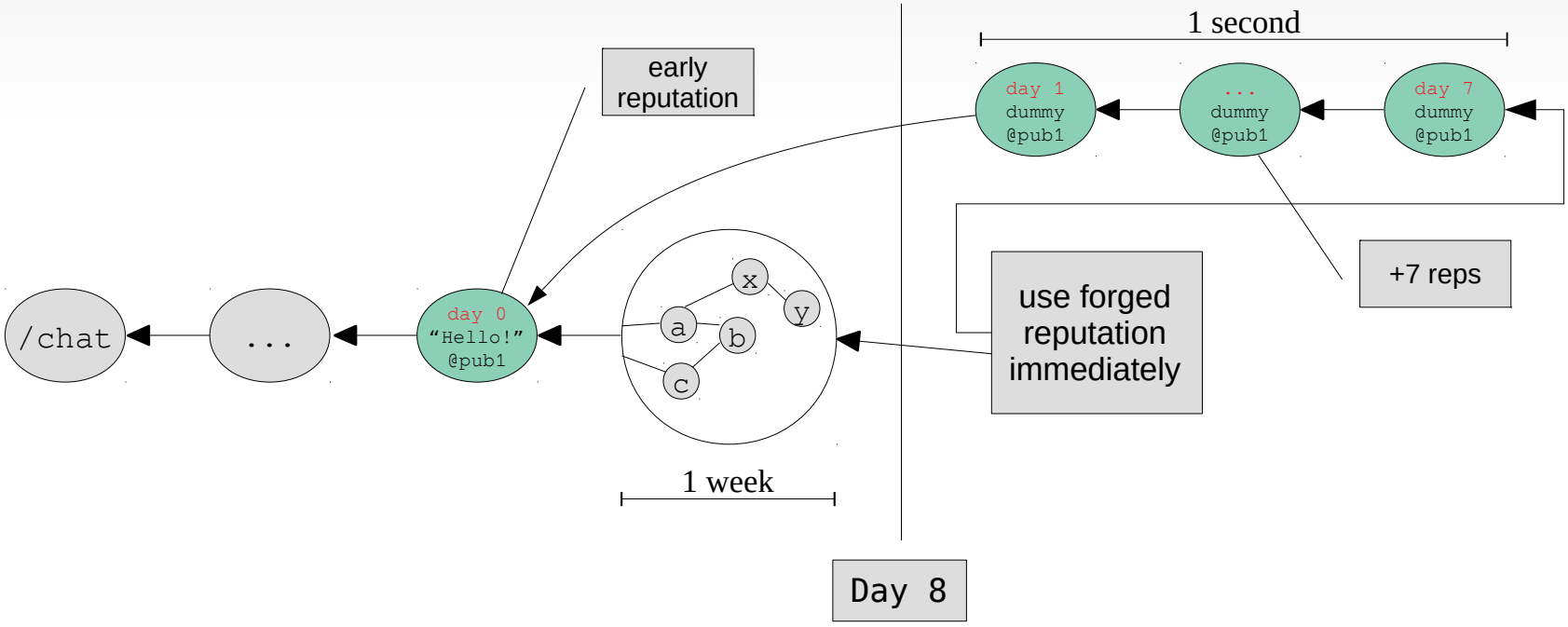
- Chains are trees...
- ...but authors’ posts must be linked lists
  - **it’s their responsibility to maintain it**
  - **forks/merges: keep largest chain (more blocks)**
    - requires rework from authors (signatures)

- previous reputation
- significant forks
- considerable activity
- identify disconnection



Forging Reps

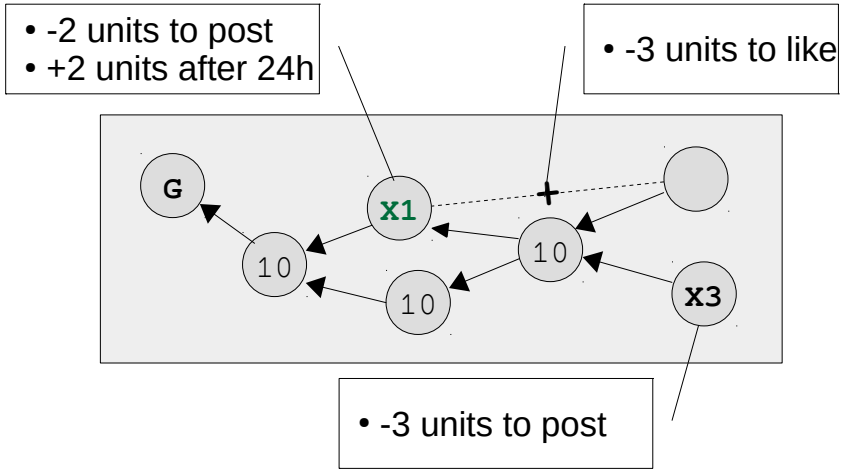
- Attacker forges a long fork to collect reps

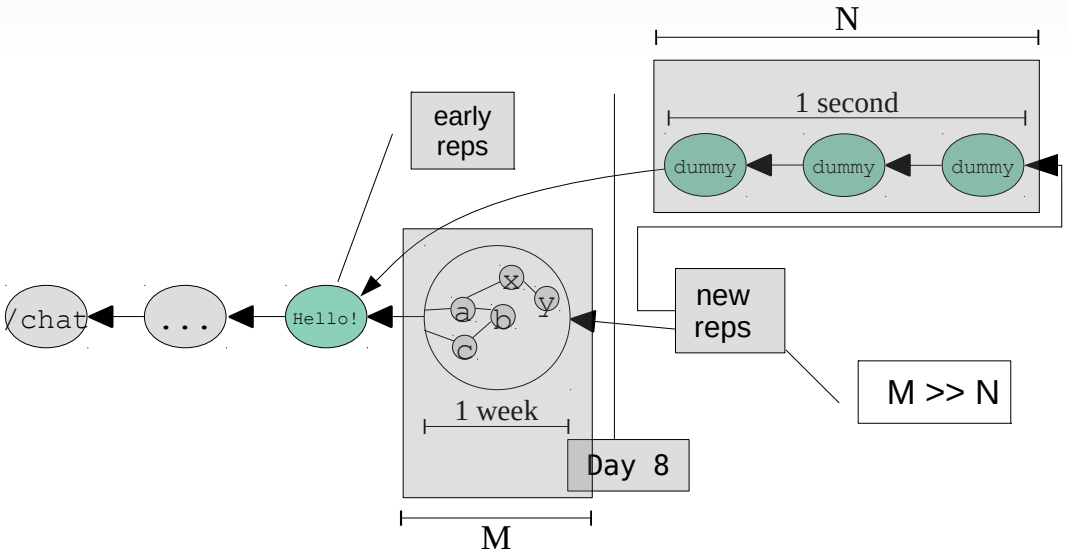


Inflationary Reps

- Reputation value is adjusted as chain grows
  - from block back to genesis

$$rep = \lceil \frac{H}{10} \rceil units$$





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