

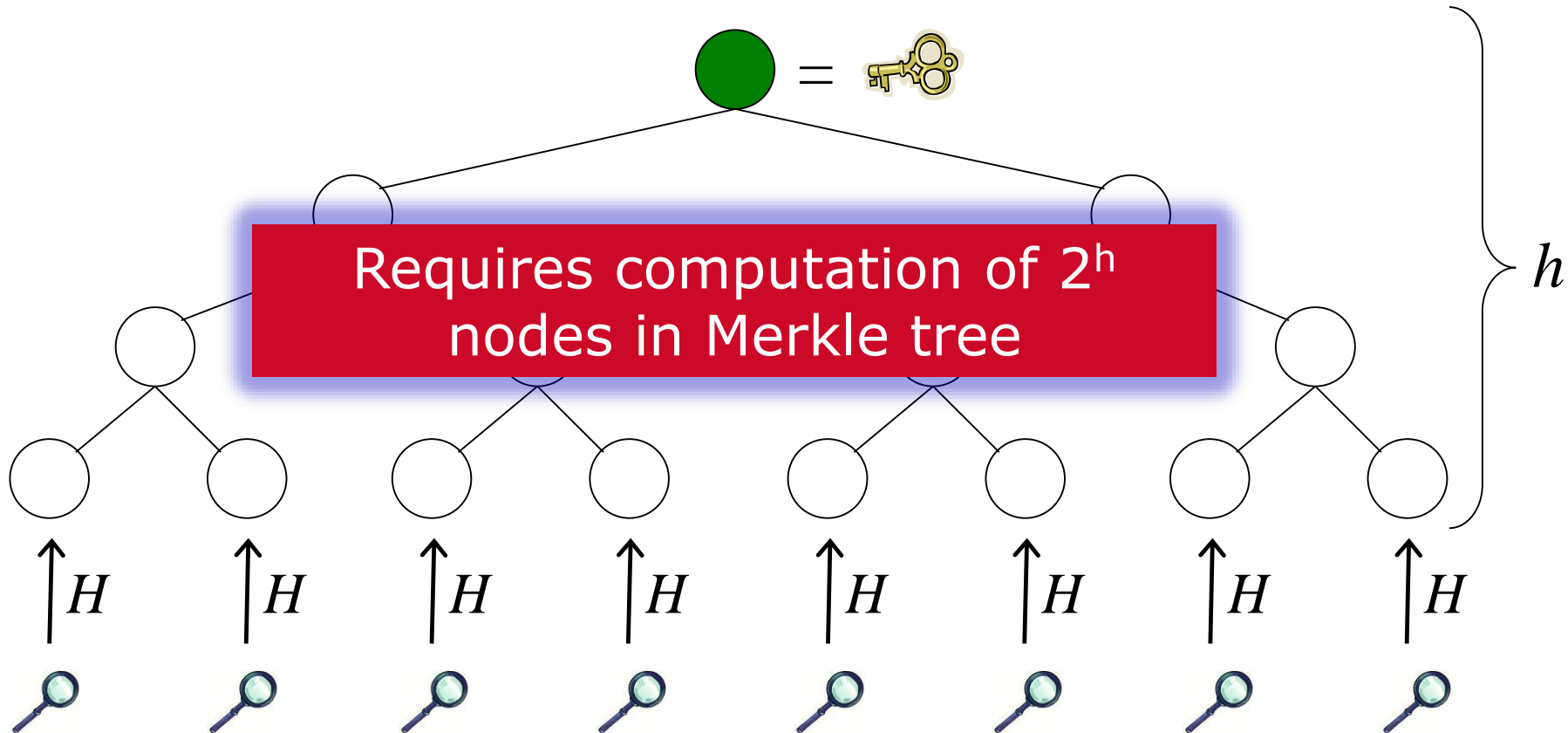
# Hash-Based Signatures



Johannes Buchmann, Andreas Hülsung  
Supported by DFG and DAAD

## Part IX: Public key generation

# XMSS Public Key Generation

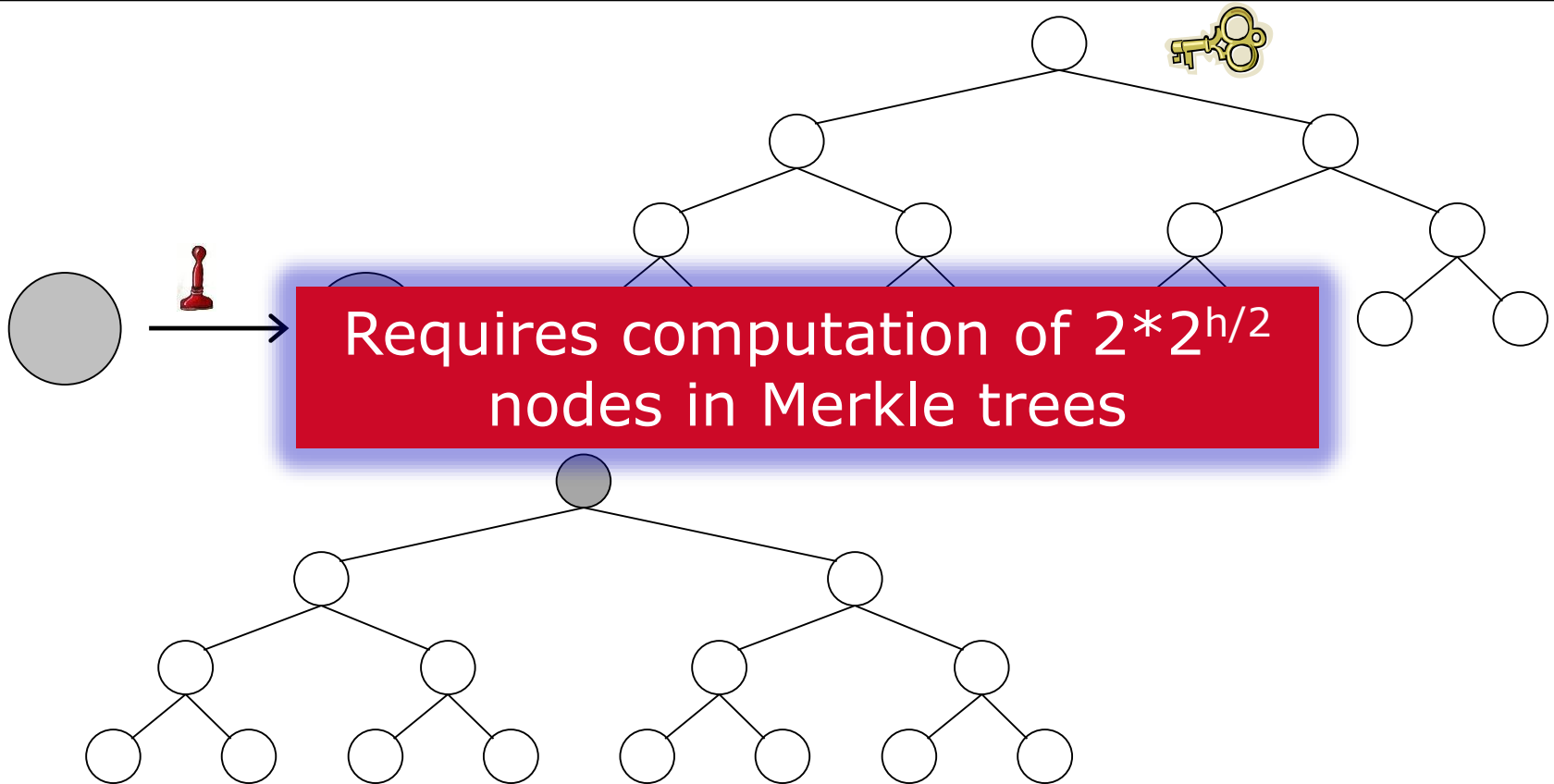


# **Tree Chaining**

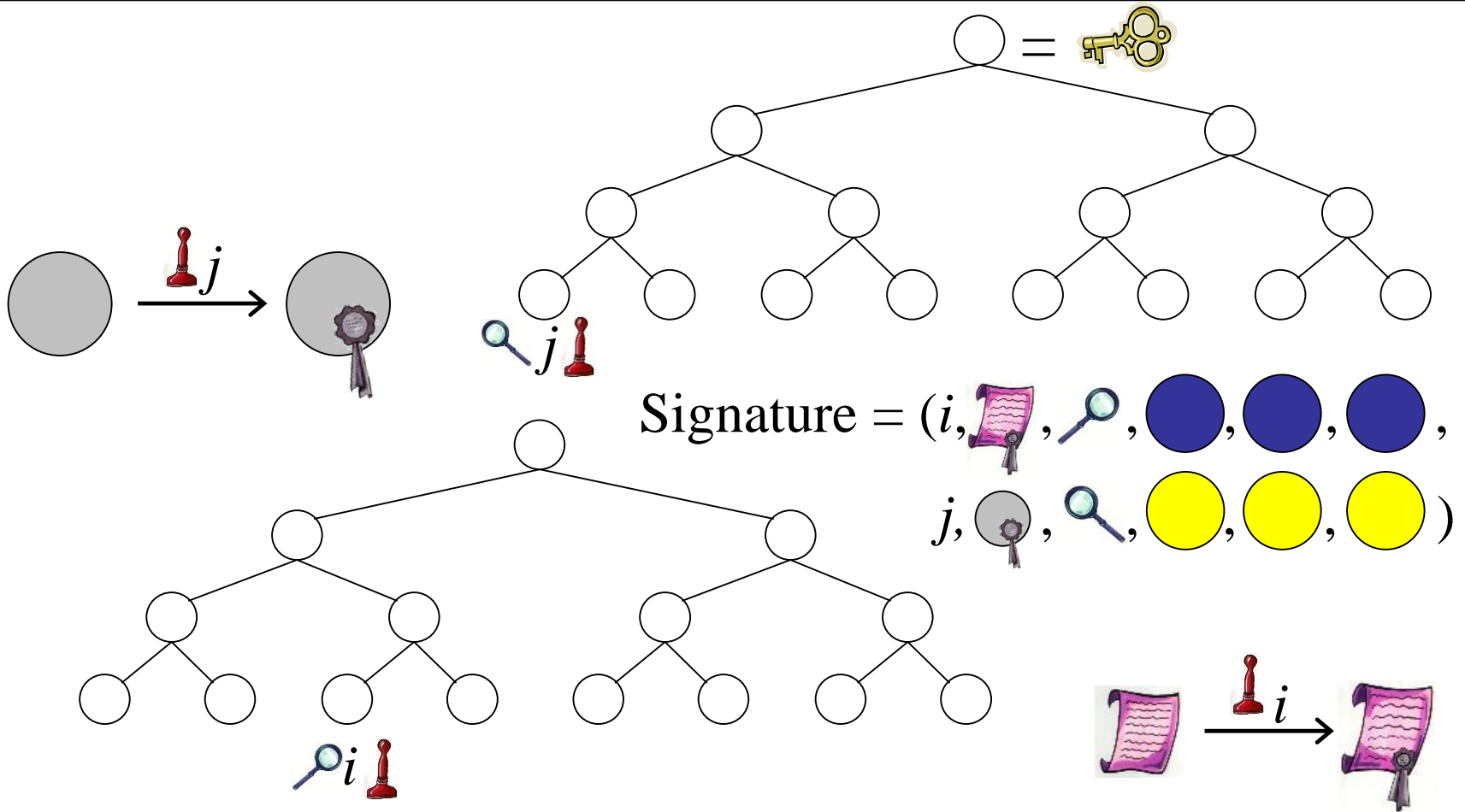
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# Two Levels

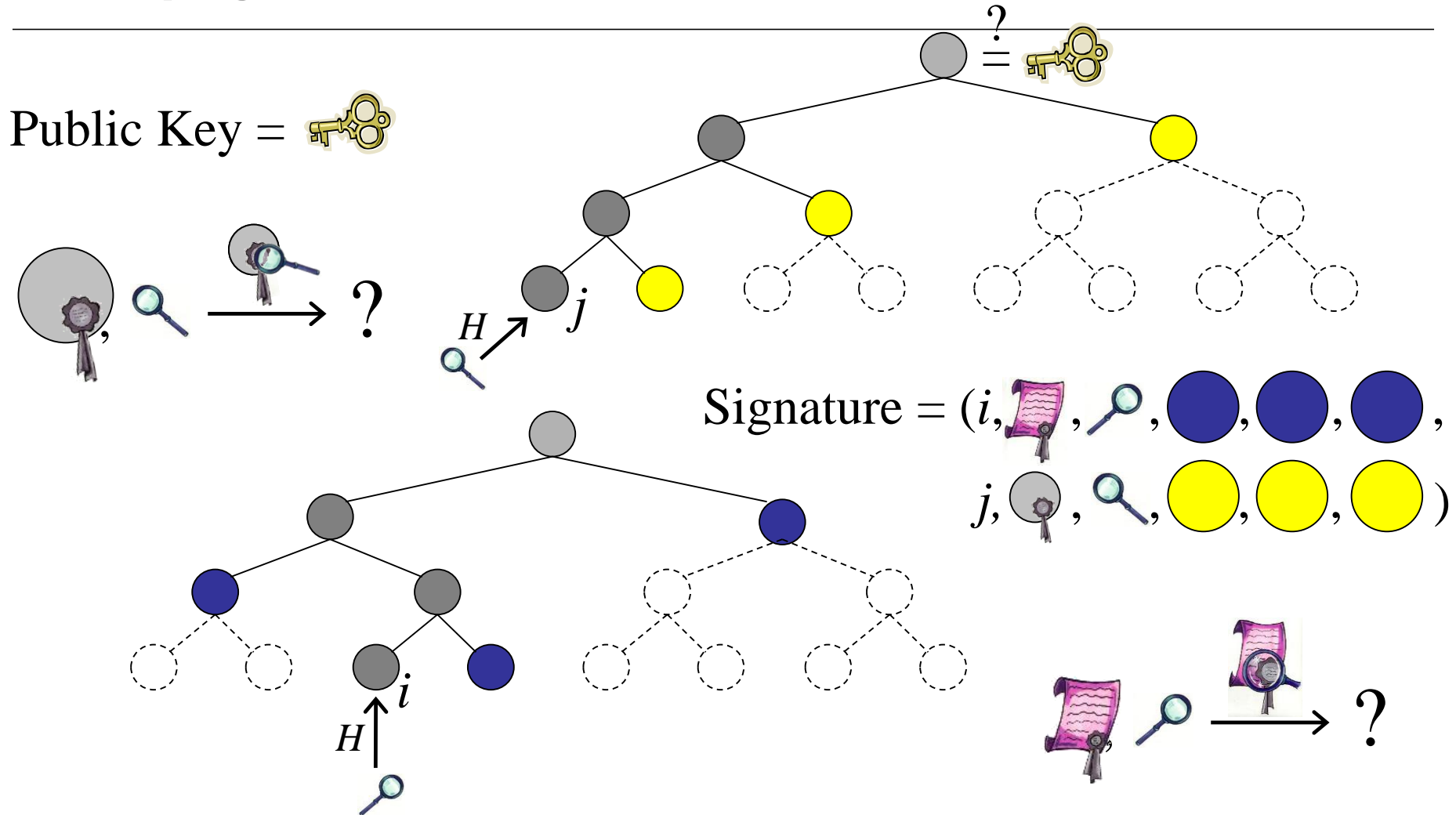
## Key generation



# Two Levels Signing



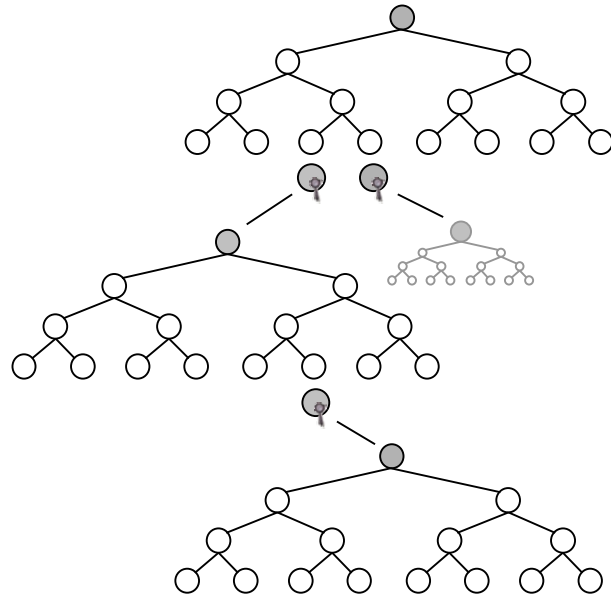
# Two Levels Verifying



# **Distributed Signature Generation**

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# Distributed Computation

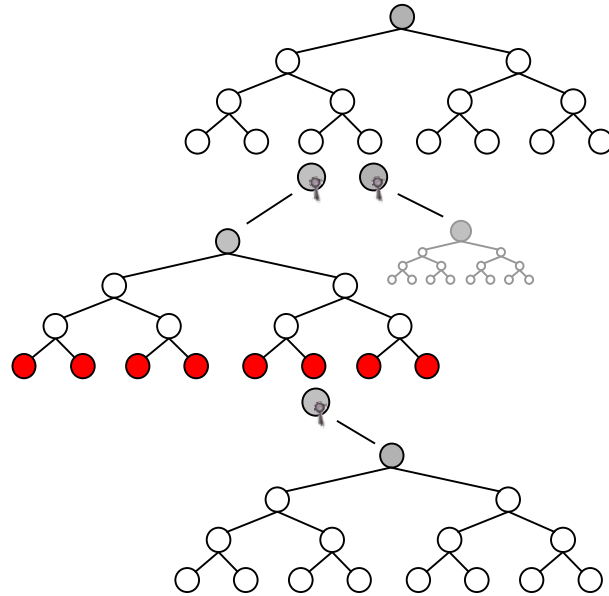


Store one-time signatures that don't change so often

Precompute upcoming signatures



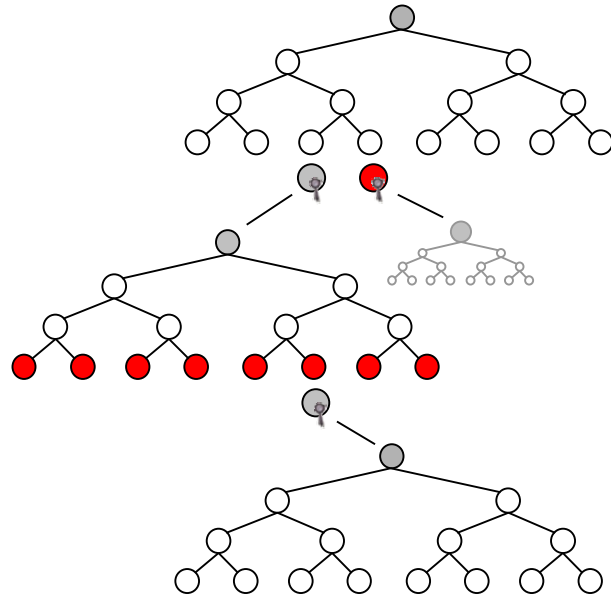
# Distributed Computation



Store one-time signatures that don't change so often

Precompute upcoming signatures

# Distributed Computation

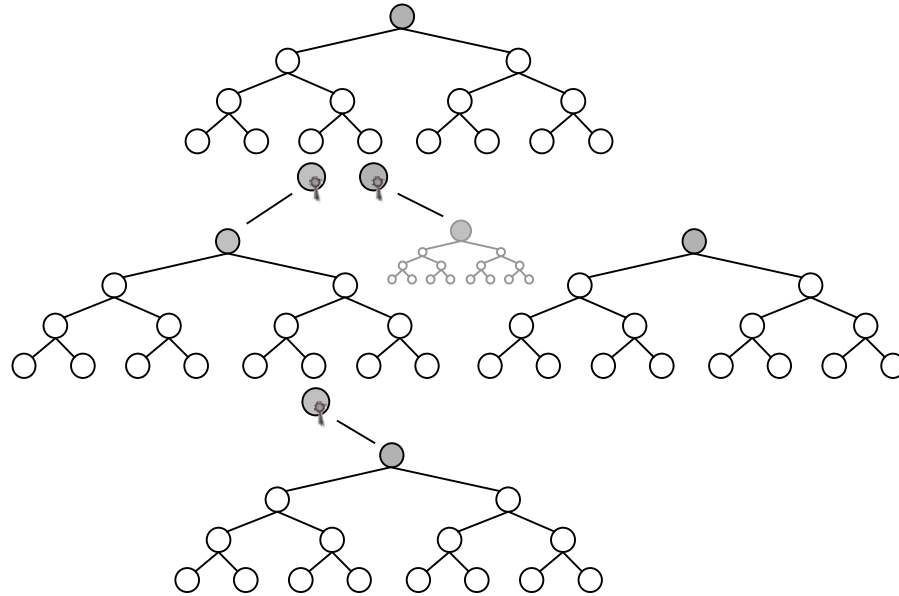


Store one-time signatures that don't change so often

Precompute upcoming signatures

Precompute upcoming roots

# Distributed Computation

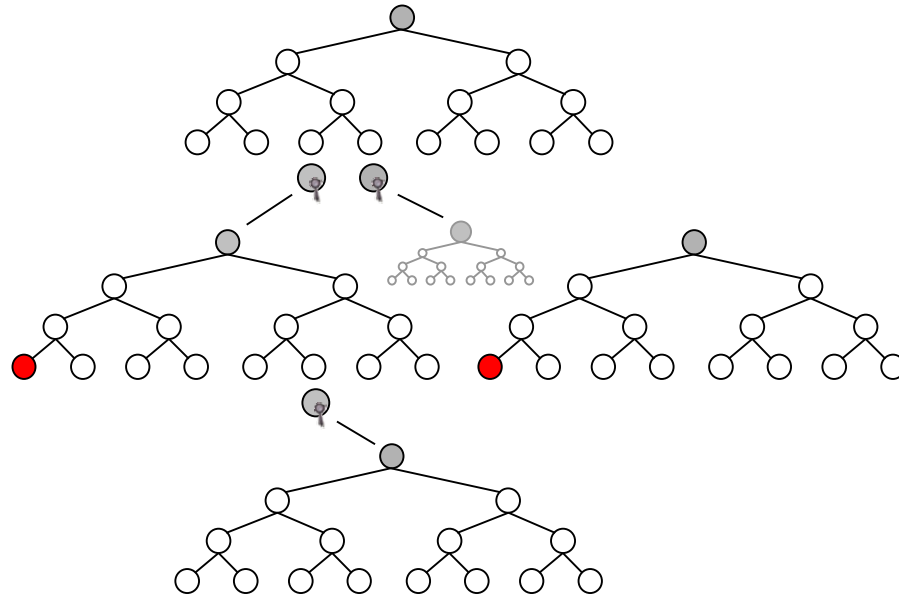


Store one-time signatures that don't change so often

Precompute upcoming signatures

Precompute upcoming roots

# Distributed Computation

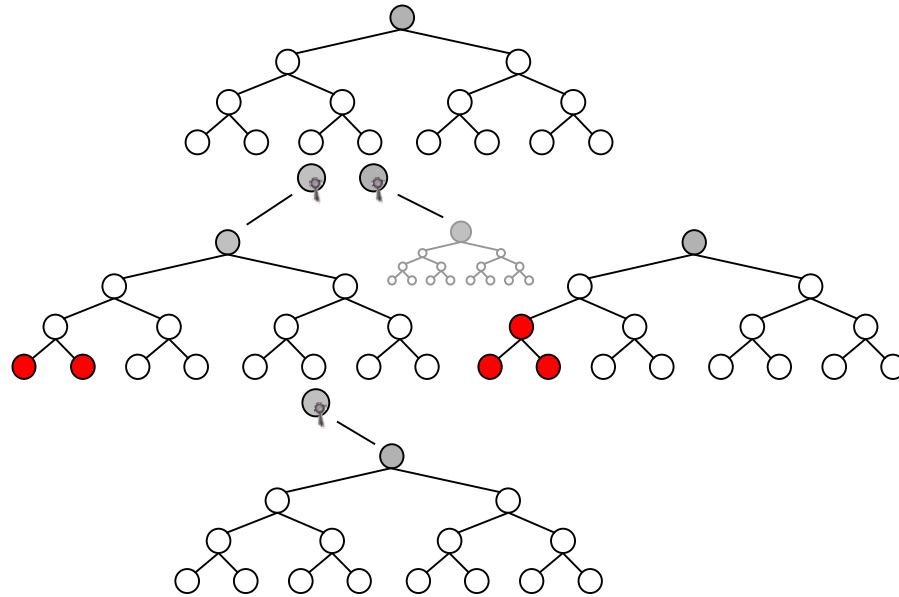


Store one-time signatures that don't change so often

Precompute upcoming signatures

Precompute upcoming roots

# Distributed Computation

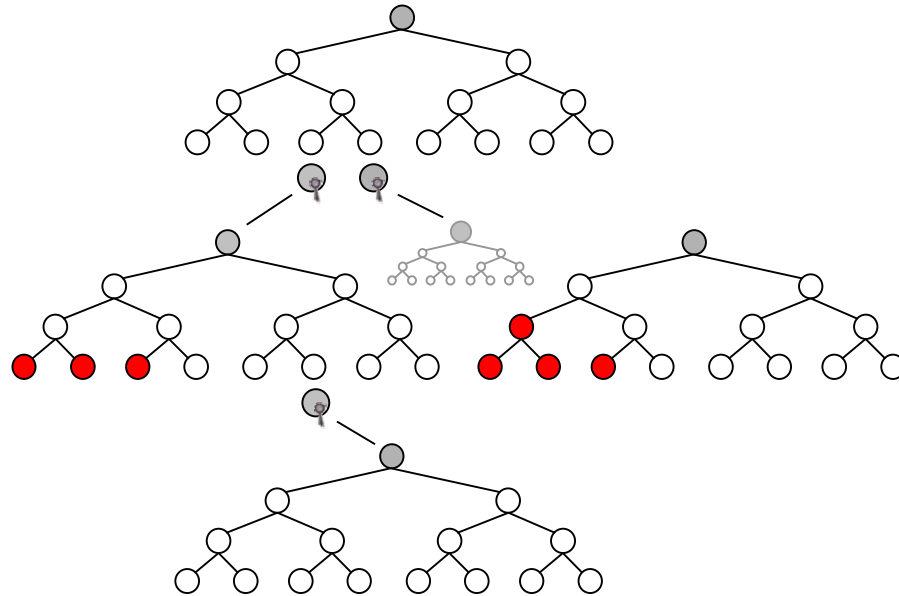


Store one-time signatures that don't change so often

Precompute upcoming signatures

Precompute upcoming roots

# Distributed Computation

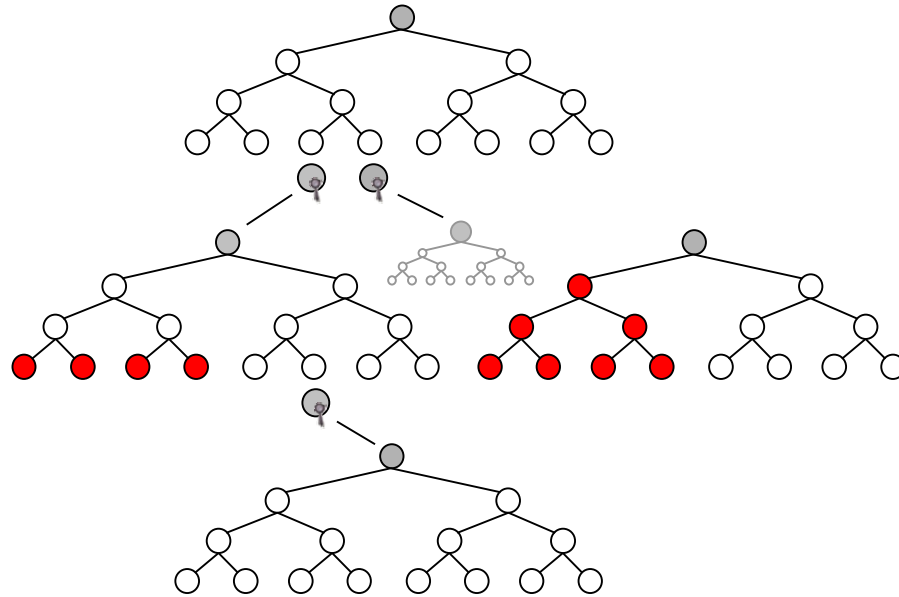


Store one-time signatures that don't change so often

Precompute upcoming signatures

Precompute upcoming roots

# Distributed Computation

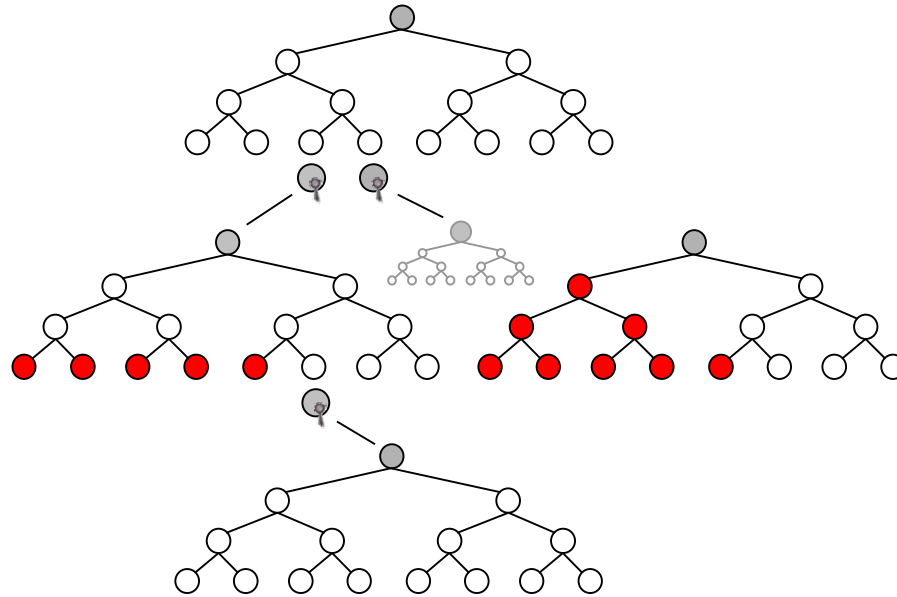


Store one-time signatures that don't change so often

Precompute upcoming signatures

Precompute upcoming roots

# Distributed Computation



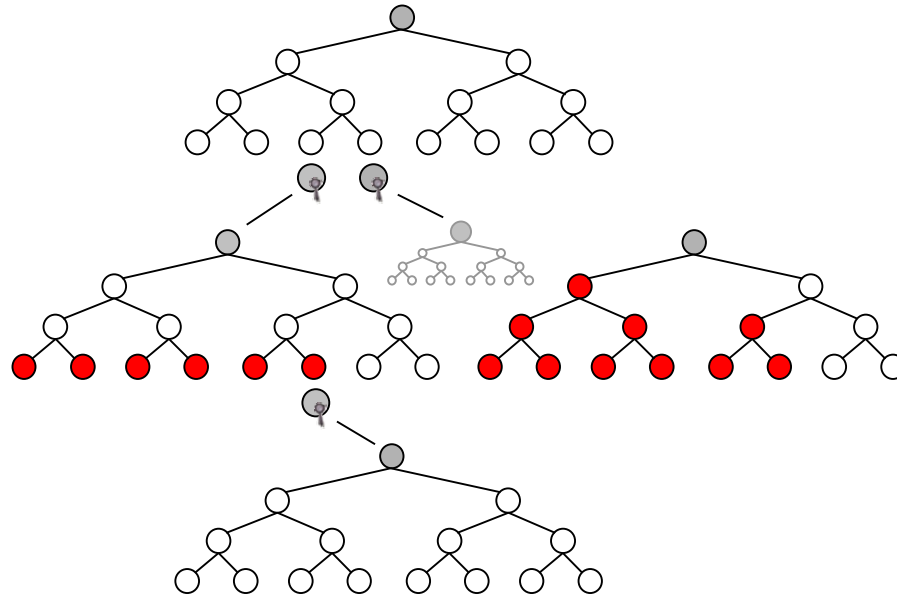
Store one-time signatures that don't change so often

Precompute upcoming signatures

Precompute upcoming roots



# Distributed Computation

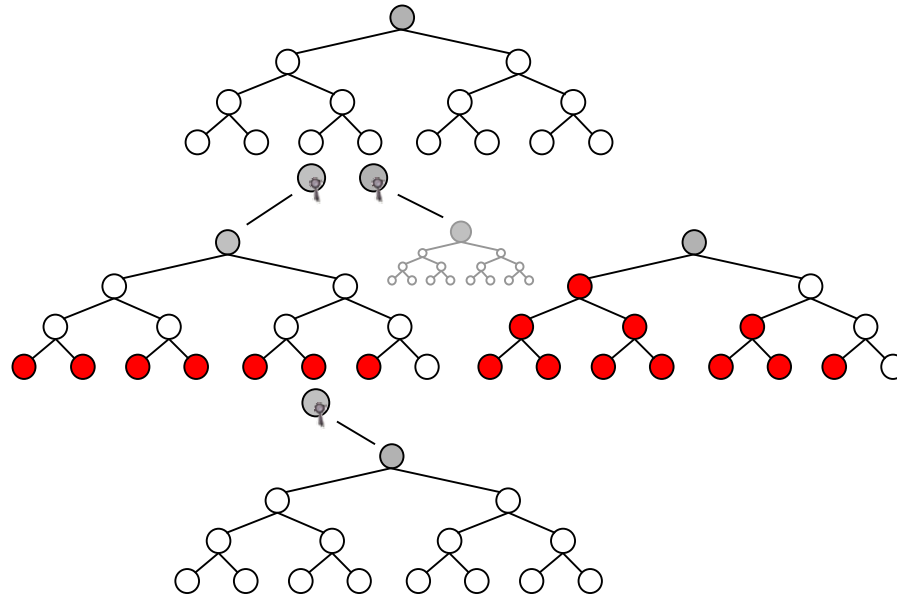


Store one-time signatures that don't change so often

Precompute upcoming signatures

Precompute upcoming roots

# Distributed Computation



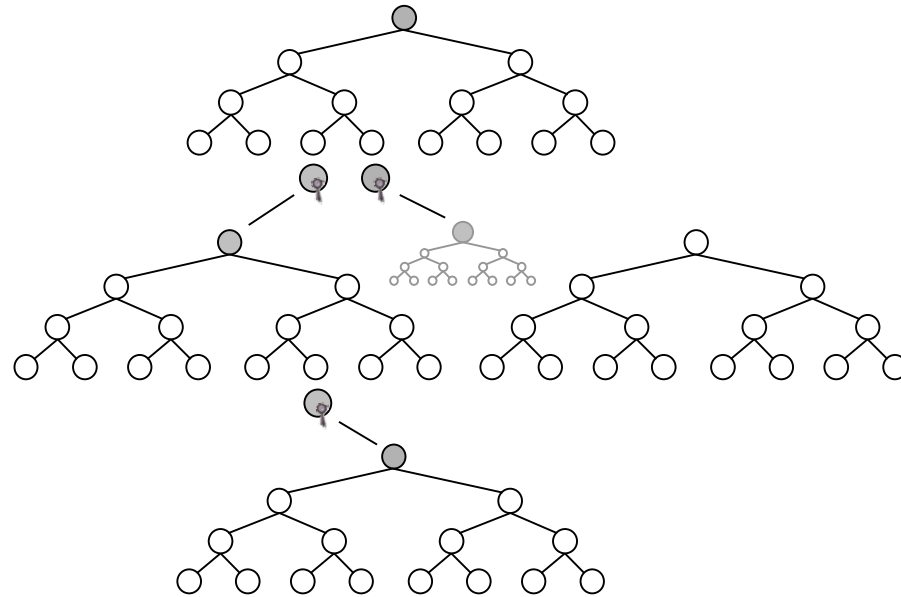
Store one-time signatures that don't change so often

Precompute upcoming signatures

Precompute upcoming roots



# Distributed Computation



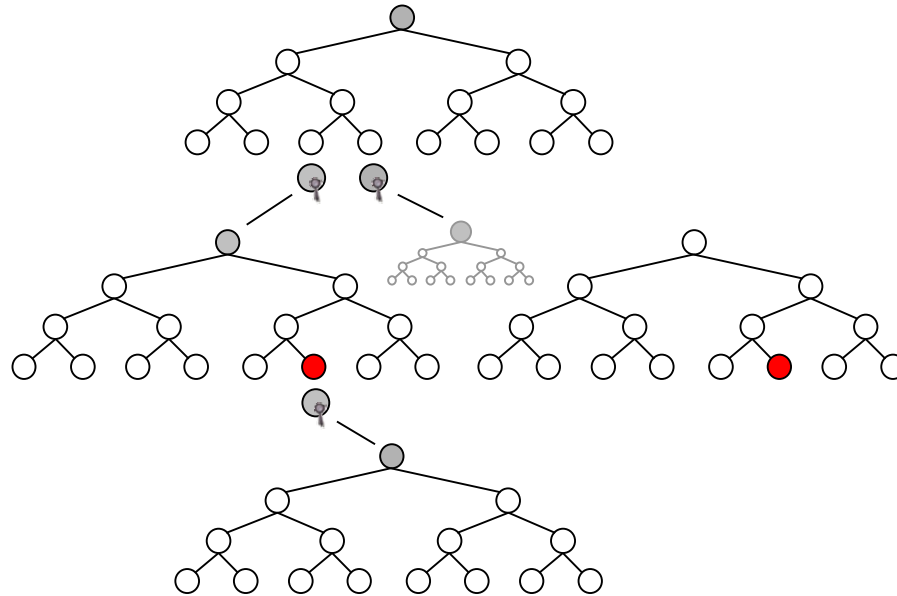
Store one-time signatures that don't change so often

Precompute upcoming signatures

Precompute upcoming roots

Precompute upcoming leaves

# Distributed Computation



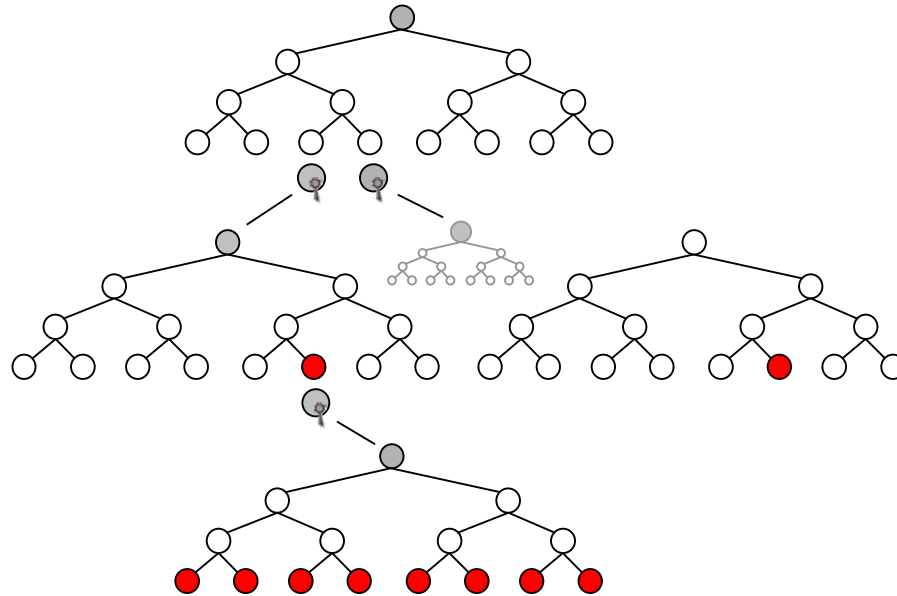
Store one-time signatures that don't change so often

Precompute upcoming signatures

Precompute upcoming roots

Precompute upcoming leaves

# Distributed Computation



Store one-time signatures that don't change so often

Precompute upcoming signatures

Precompute upcoming roots

Precompute upcoming leaves