

Scalability Minimal Theory

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You will learn:

- The Speed of Light
- The Speed of Light
- The Latency of Network
- The Speed of Disk
- Solutions to slowness

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10 Users, 10 ZEO Clients

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Why are Software Slow ?

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- How long does it take at least ?

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The Frequency of CPU: 2Ghz

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The Speed of Light: 300,000 km/s

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The Frequency of RAM: 200 Mhz

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Why are Software Slow ?

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- $1e12 * 6.82 \text{ e-9} = 6820 \text{ s} = \text{about 2 hours}$
- $16e9 * 6.82 \text{ e-9} = 109 \text{ s} = 2 \text{ min}$

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The Speed of Light: 300,000 km/s

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Why are Software Slow ?

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- $1e12 * 23.16 = 23160 \text{ s} = 6.4 \text{ hours}$
- $16e9 * 23.16 = 370 \text{ s} = 6 \text{ minutes}$

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The Latency of Network: 1 μ s to 1ms

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Why are Software Slow ?

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- $1e12 * 3316.5 = 38 \text{ days}$
- $16e9 * 3316.5 = 14 \text{ hours}$

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The Speed of Disks: 10,000 rpm

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Why are Software Slow ?

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- $1e12 * 3000023.16 = 95 \text{ years}$
- $16e9 * 3000023.16 = 1.5 \text{ year}$

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The Latency of SSD: 200 μ s or better

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Why are Software Slow ?

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- $1e12 * 200023.16 = 6 \text{ years}$
- $16e9 * 200023.16 = 37 \text{ days}$

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Access Conflict (Serialized)

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Why are Software Slow ?

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- $1e12 * 66011.5 = 2 \text{ years}$
- $16e9 * 66011.5 = 12 \text{ days}$

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Solving Access Conflict by Sharding

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Why are Software Slow ?

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- $1e12 * 13211.5 = 152 \text{ days}$
- $16e9 * 13211.5 = 2.42 \text{ days}$

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Solving Access Conflict by Caching

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Why are Software Slow ?

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- $1e12 * 6.82 \text{ e-9} = 6820 \text{ s} = \text{about 2 hours}$
- $16e9 * 6.82 \text{ e-9} = 109 \text{ s} = 2 \text{ min}$

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Solving Access by Beautiful Code

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- $1e12 * 6.32 \text{ e-9} = 6320 \text{ s} = \text{about 2 hours}$
- $16e9 * 6.32e-9 = 101 \text{ s} = 2 \text{ min}$

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Solving Access by Better Algorithm

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- $1e6 * 99010.5 = 1.65 \text{ minute}$

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Better Algorithm for 90% cases

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$(1.65 \text{ minutes} * 90 + 2 \text{ years} * 10) / 100 = 2.4 \text{ months}$

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Be Radical

- 0 s

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What About ERP5 (1)

- Postpone
 1. Ajax Menus
 2. Ajax Display
 3. Activities
- Acces Conflict
 1. ID Generation
 2. Acces to Same Btree (HBTree)

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What About ERP5 (2)

- Caching
 1. portal_caches
 2. HTTP cache
- Sharding

developer-Scalability.Minimal.Theory.html5.why.software.slow.

 1. Multiple Data.fs
 2. NEO

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What About ERP5 (3)

- Algorithm
 1. SQL Optimization
 2. Catalog vs. ZODB

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