

TRUSTING TRUST REVISITED

Preventing Software Supply Chain Attacks
Using Modern Methods

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Seminar
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Institute of Distributed Systems, Ulm University

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2

~ 18 000 customers^[7]

SolarWinds

2020

> 500 million users^[1]

XcodeGhost

2015

> 100 000 users^[2]

Win32/Induc

2009

3

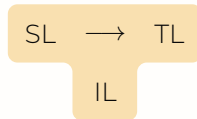
The Attack

[3] McKeeman, Horning und Wortman: *A Compiler Generator* 1970

[6] Thompson: „Reflections on Trusting Trust“ 1984

3

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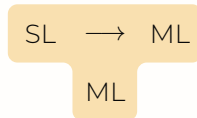


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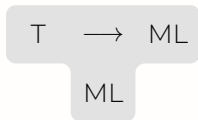
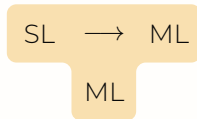


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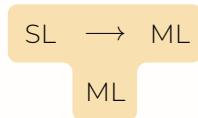
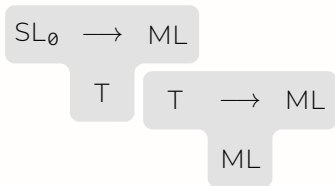


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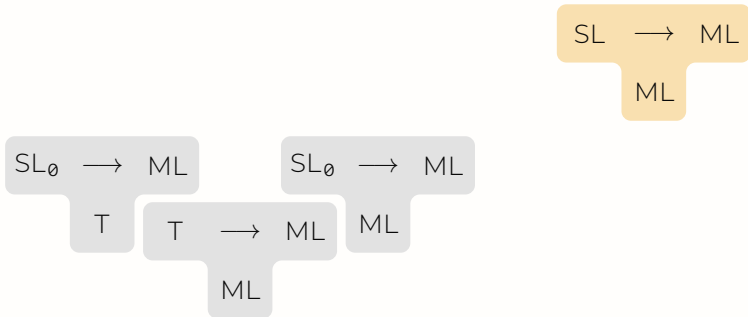


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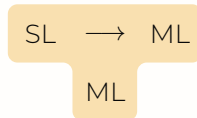
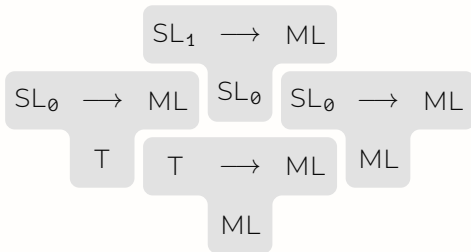


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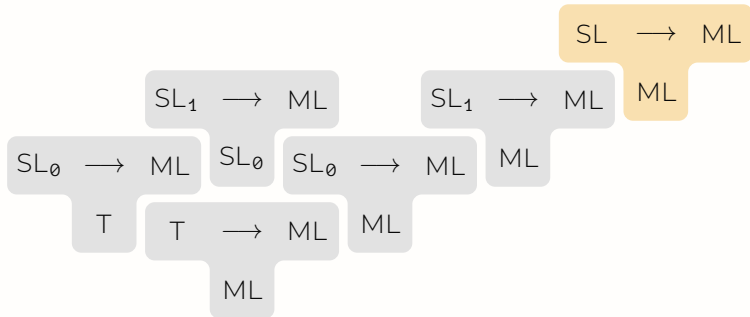


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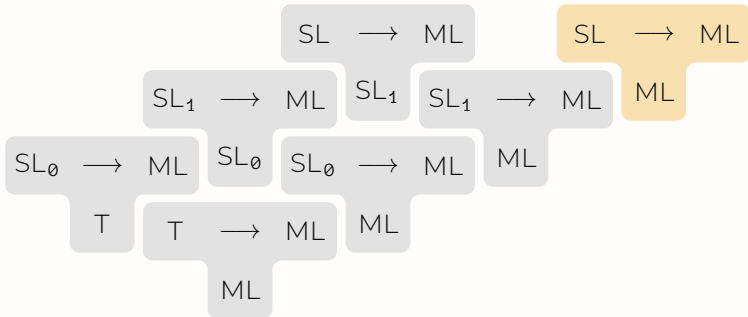


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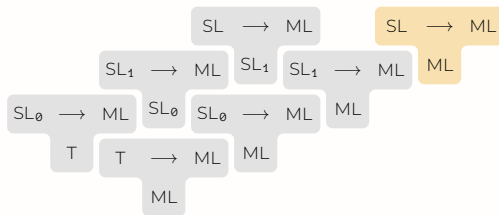


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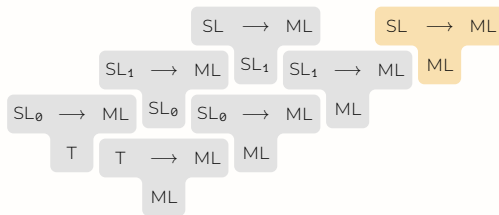


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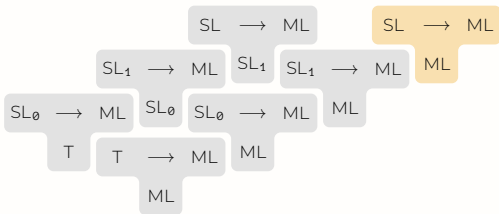
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`compile()`

3

The Attack



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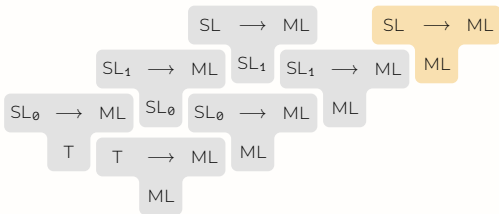
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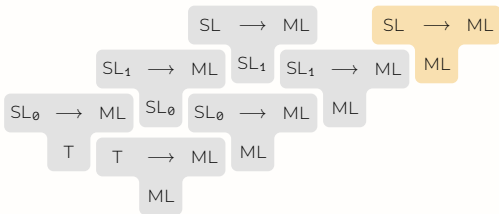
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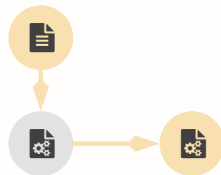
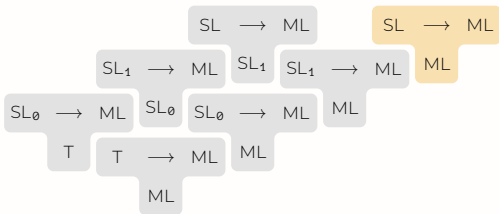
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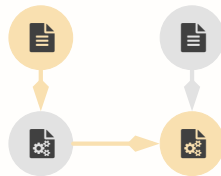
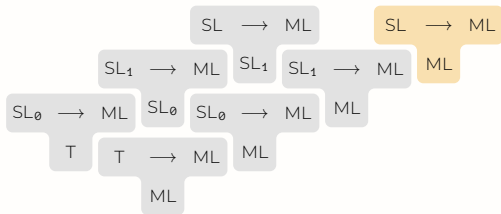
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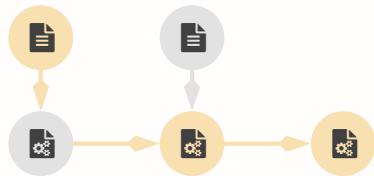
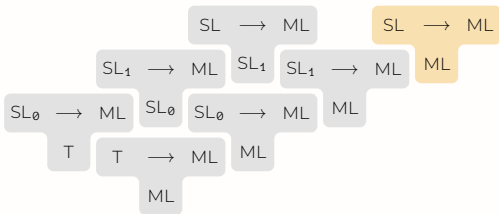
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4

Diverse Double Compiling

4

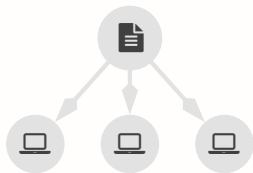
Diverse Double Compiling



Reproducible

4

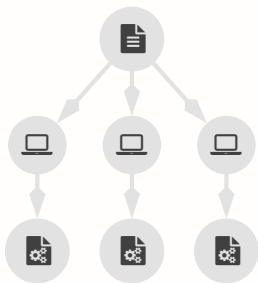
Diverse Double Compiling



Reproducible

4

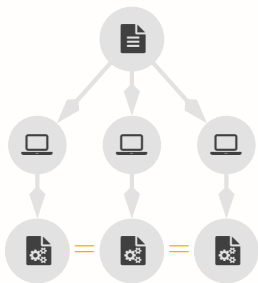
Diverse Double Compiling



Reproducible

4

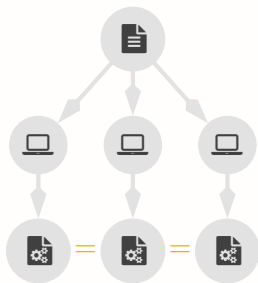
Diverse Double Compiling



Reproducible

4

Diverse Double Compiling



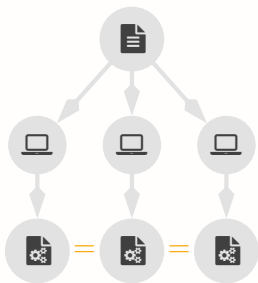
Reproducible

1.



4

Diverse Double Compiling

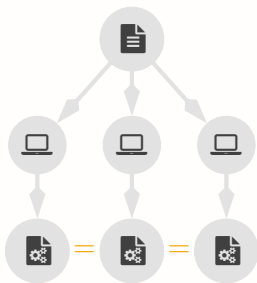


Reproducible



4

Diverse Double Compiling

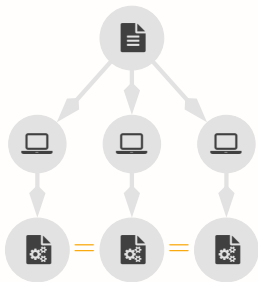


Reproducible



4

Diverse Double Compiling



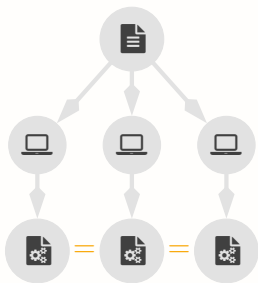
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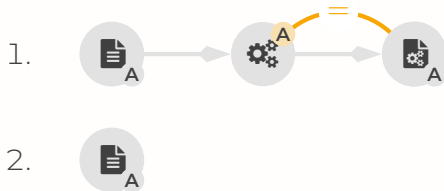


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Diverse Double Compiling

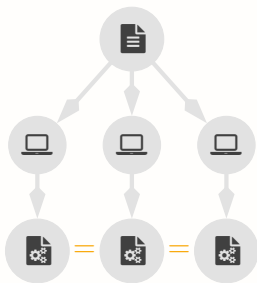


Reproducible

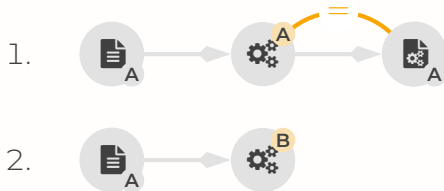


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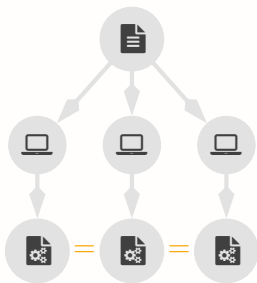


Reproducible

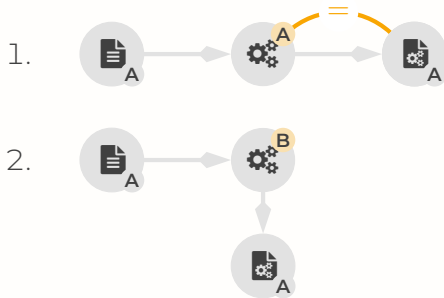


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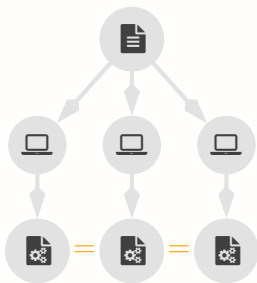


Reproducible

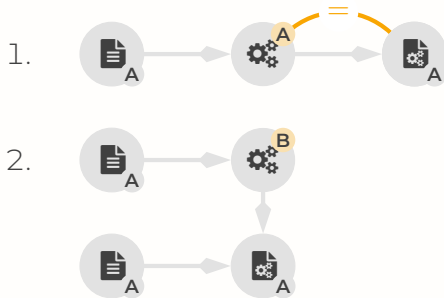


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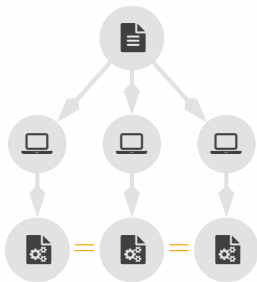


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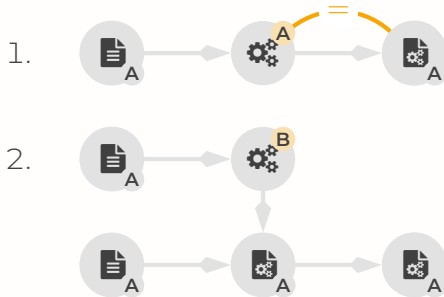


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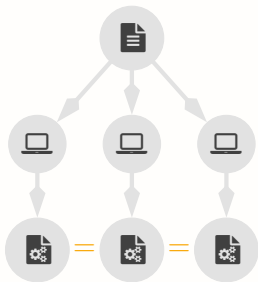


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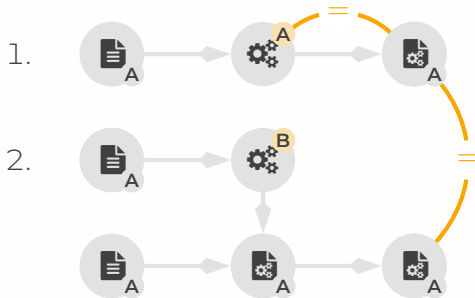


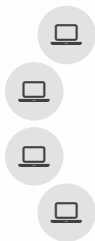
4

Diverse Double Compiling



Reproducible





[4] Nikitin, u. a.: „CHAINIAC: Proactive Software-Update Transparency via Collectively Signed Skipchains and Verified Builds“
2017

5

CHAINIAC

Developers



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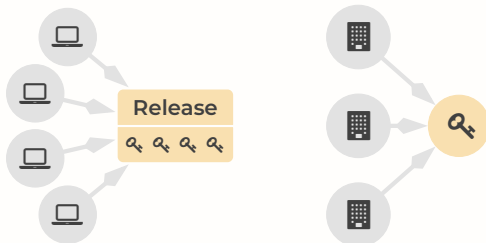
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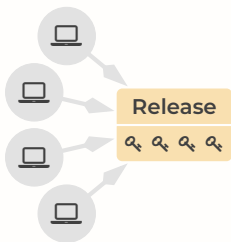
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Timeline

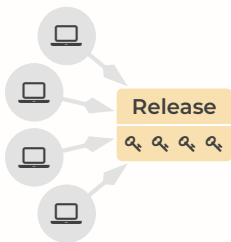


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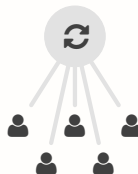
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Timeline



Mirror



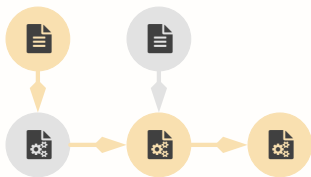
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Conclusion

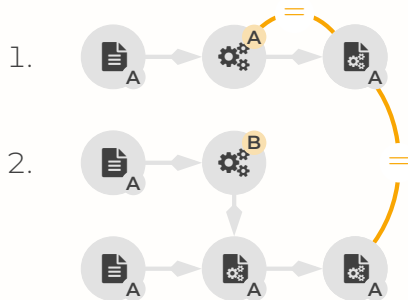
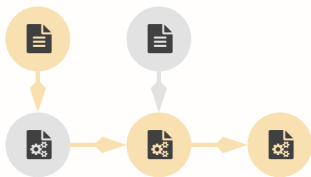
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Conclusion



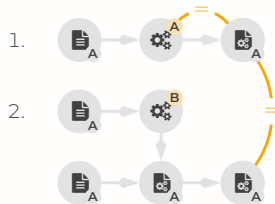
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Conclusion



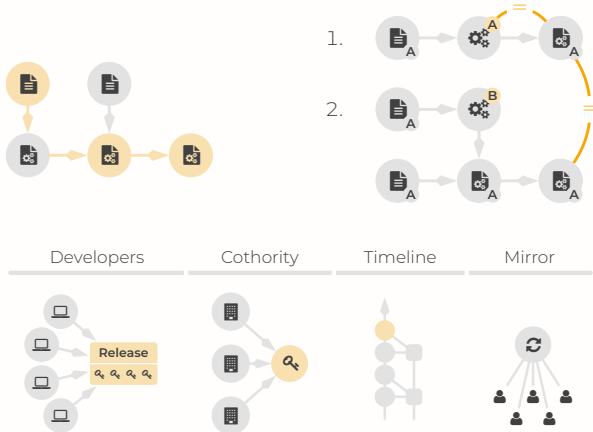
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Conclusion



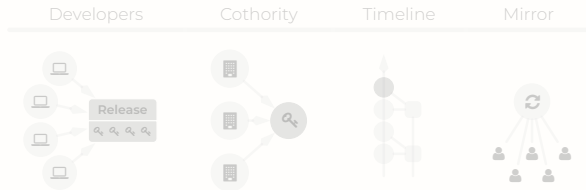
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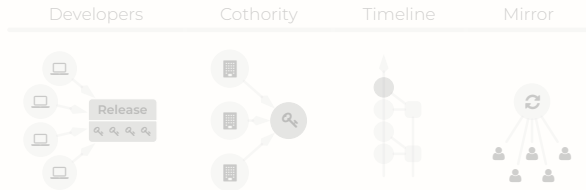
Conclusion



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Conclusion

> Reproducible Builds



6

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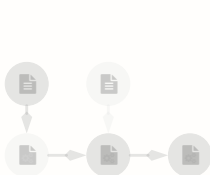
- › Reproducible Builds
- › Tool support



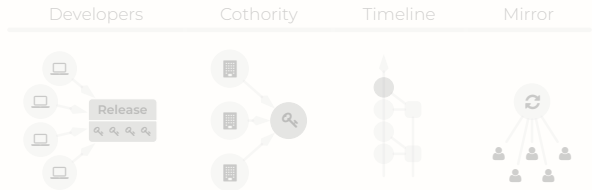
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Conclusion

- › Reproducible Builds
- › Tool support



- › Trust



6

Conclusion

- › Reproducible Builds
- › Tool support



- › **Trusting Trust**

