

# Preparing DNSSEC for the Future

A Joint-PhD Journey

Moritz Müller | CODE Annual Meeting | 2020-11-12  
Supervised by Aiko Pras and Roland van Rijswijk Deij

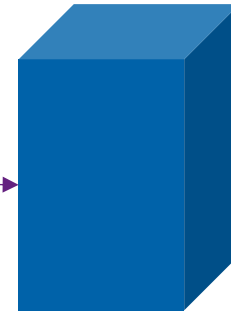
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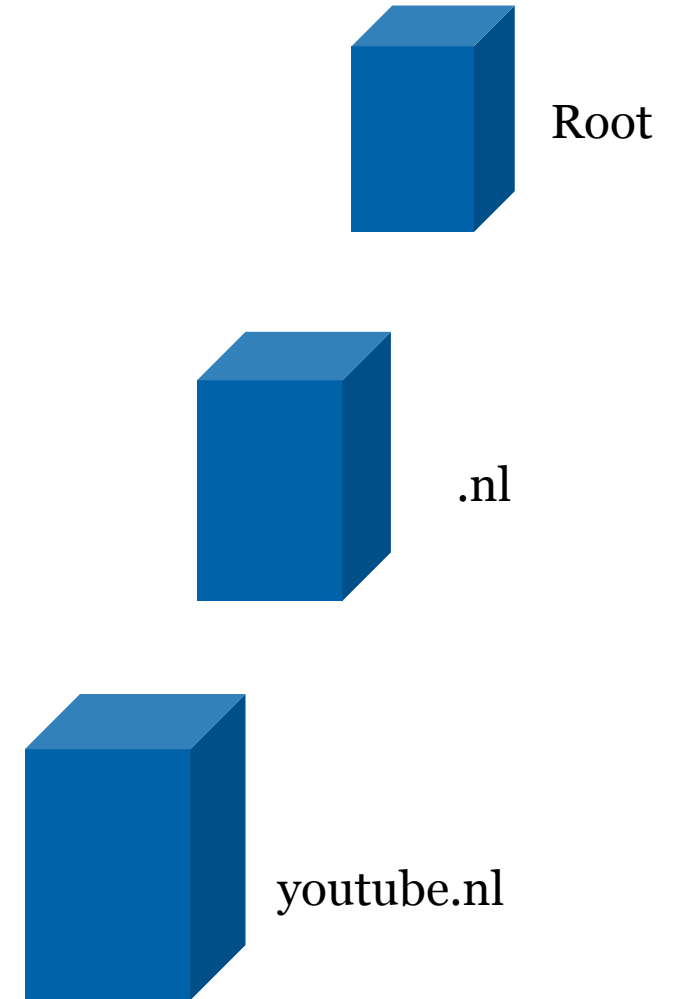
# DNS Basics



What is the IP  
address of  
www.youtube.nl



Resolver



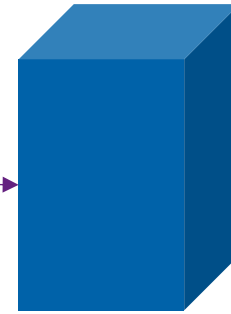
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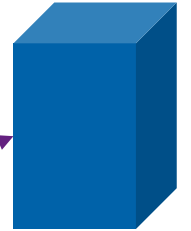
# DNS Basics



What is the IP  
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www.youtube.nl



Resolver



Root



.nl



youtube.nl

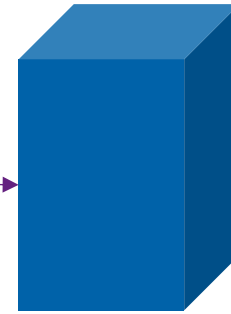
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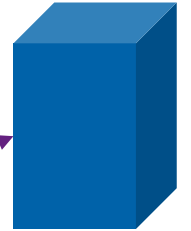
# DNS Basics



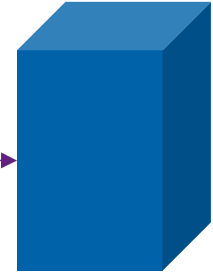
What is the IP  
address of  
www.youtube.nl



Resolver



Root



.nl



youtube.nl

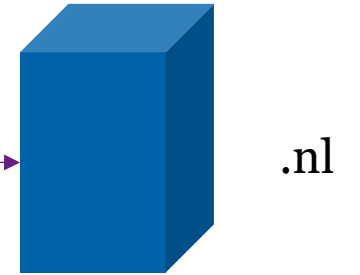
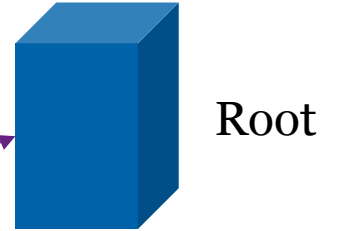
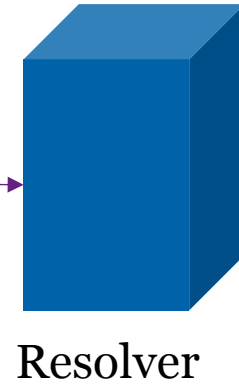
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# DNS Basics



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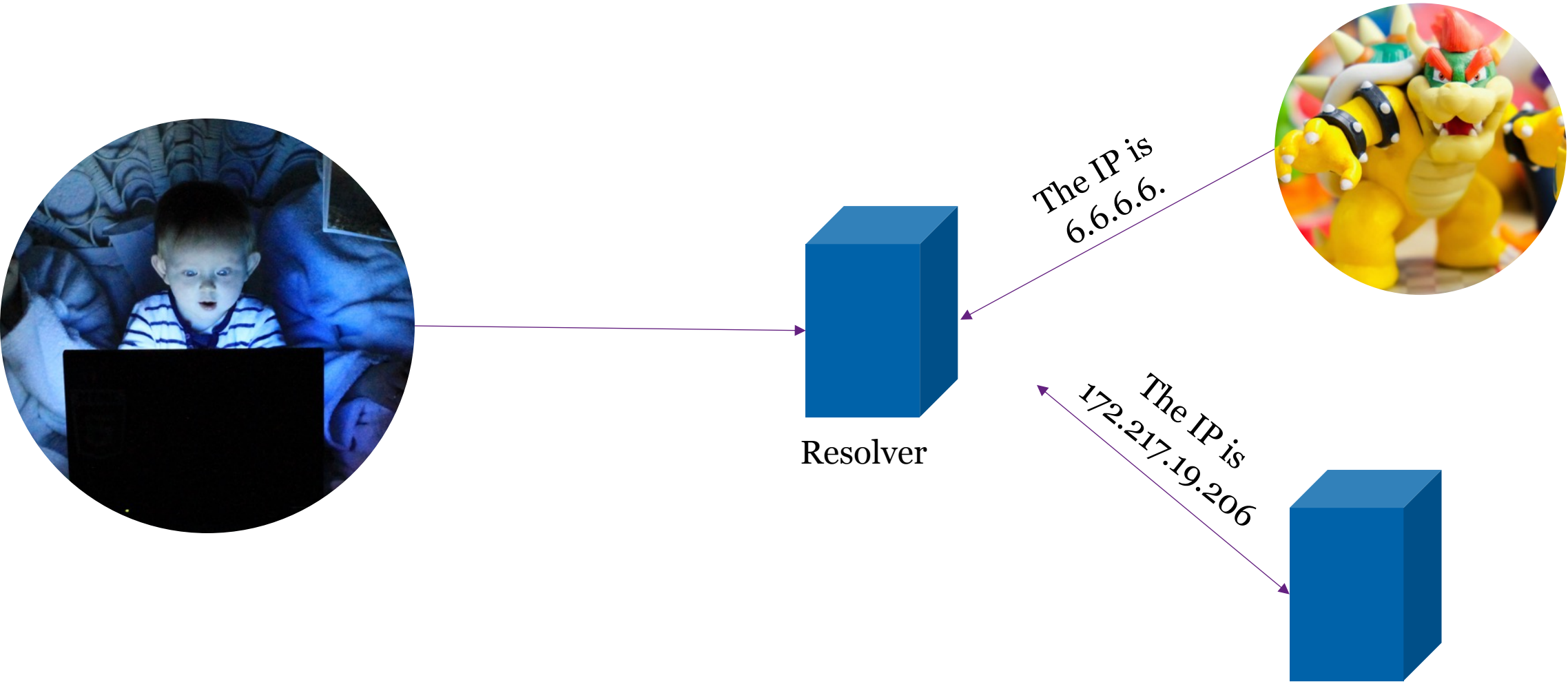


The IP is  
172.217.19.206

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# DNS Basics



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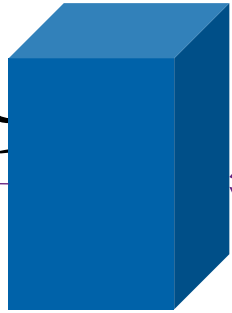


# DNSSEC



The IP is  
172.217.19.206

*you*



Resolver



Root



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# DNSSEC



Security of DNSSEC relies on  
**Cryptographic Algorithms**, but:

- Insecure algorithms are still very common
- Quantum Computers could threaten all used algorithms

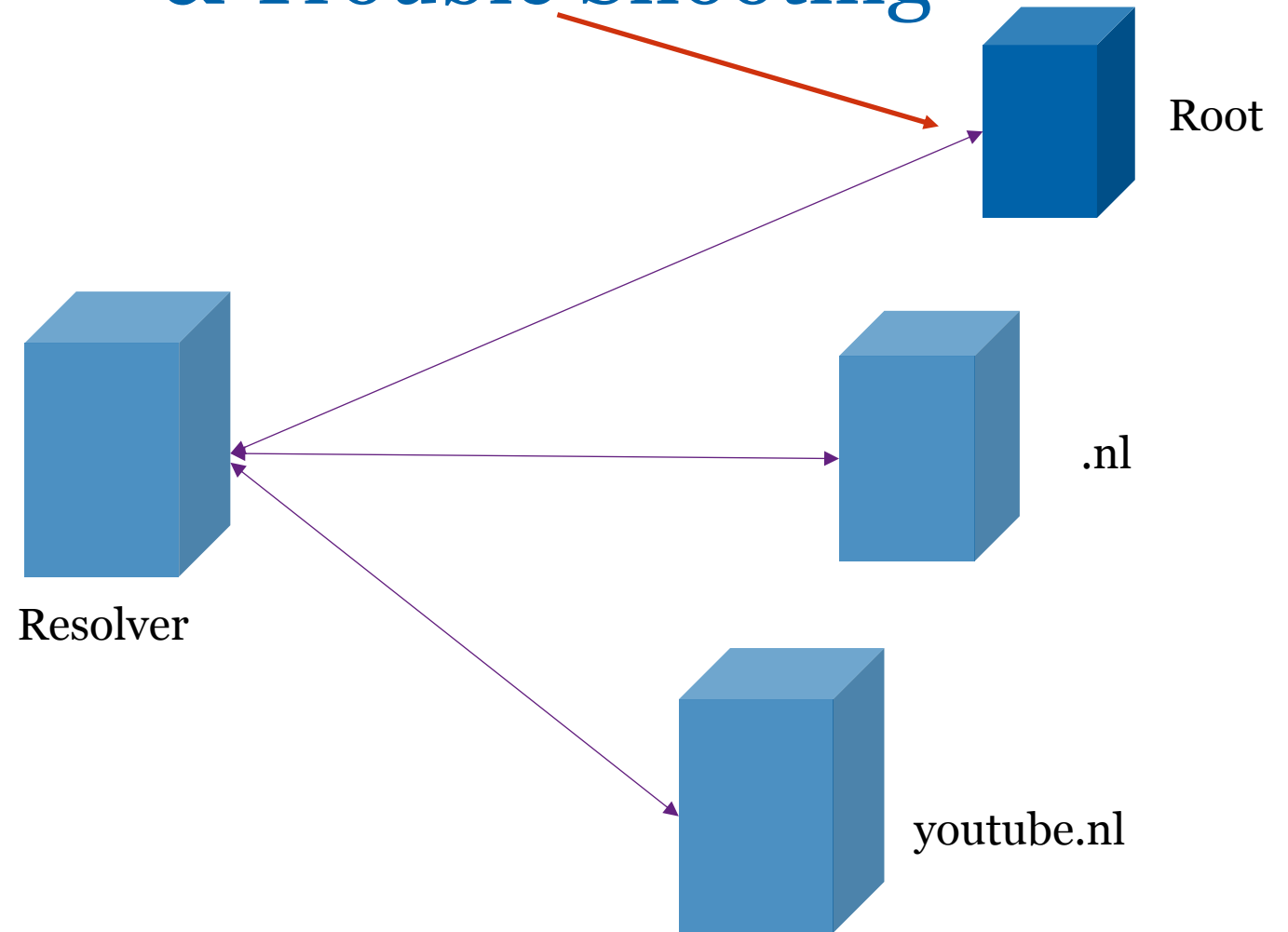


**Is DNSSEC ready for the future?**





# Monitoring & Troubleshooting



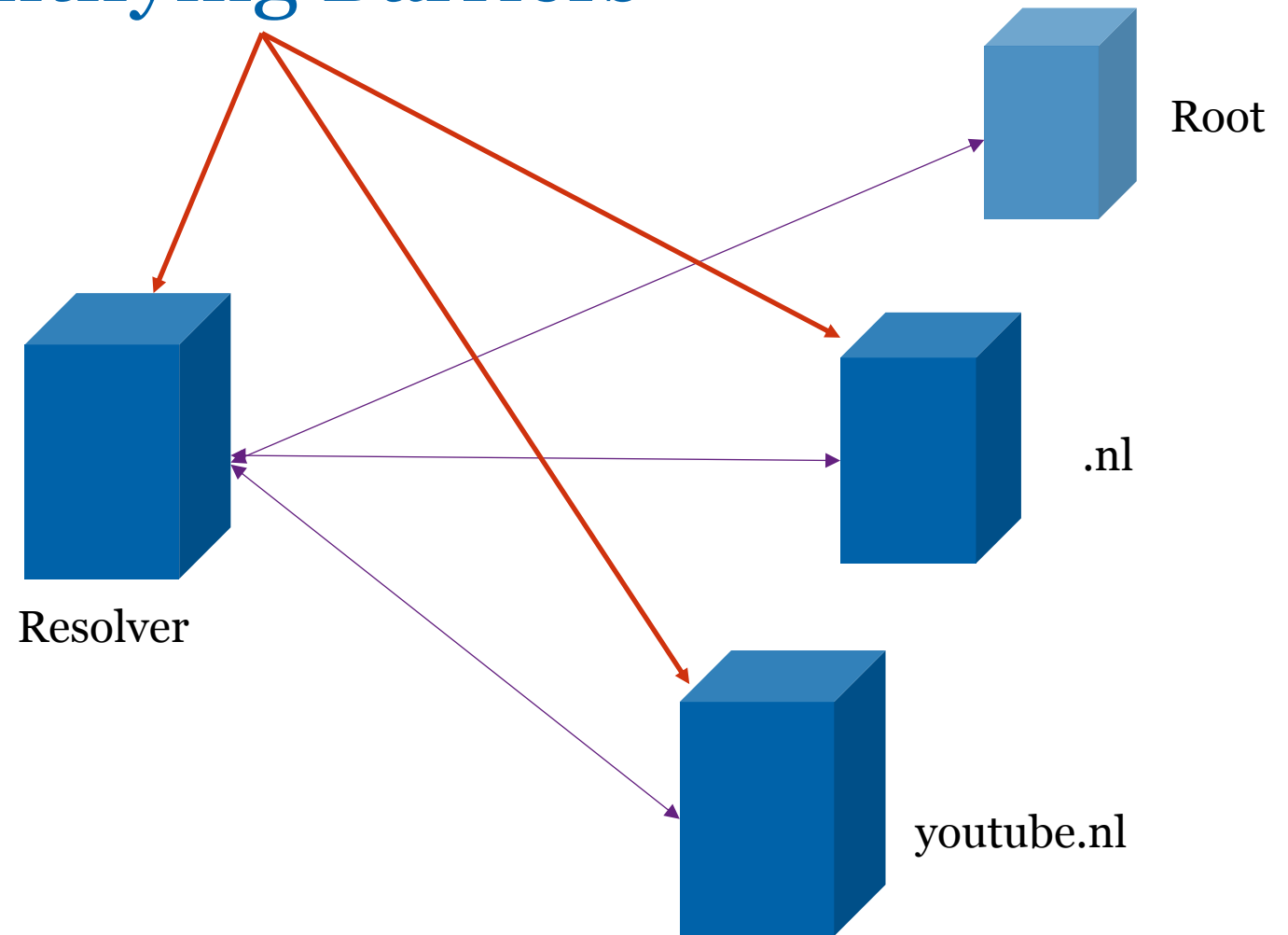
Müller, M., Thomas, M., Wessels, D., Hardaker, W., Chung, T., Toorop, W., & Rijswijk-Deij, R. V. Roll, Roll, Roll your Root: A Comprehensive Analysis of the First Ever DNSSEC Root KSK Rollover.

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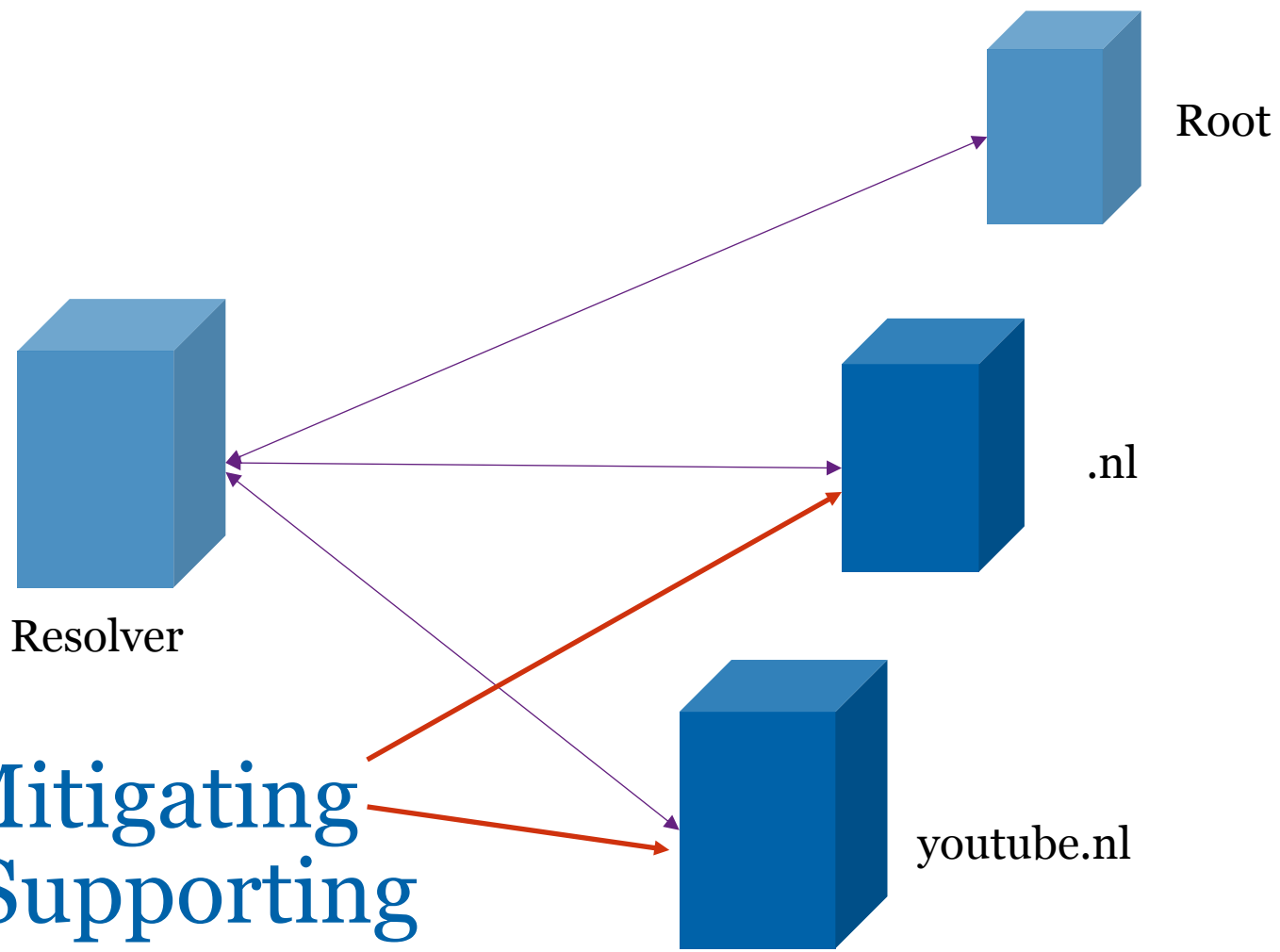
# Identifying Barriers



Müller, M., Toorop, W., Chung, T., Jansen, J., & van Rijswijk-Deij, R. (2020, October). The Reality of Algorithm Agility: Studying the DNSSEC Algorithm Life-Cycle.

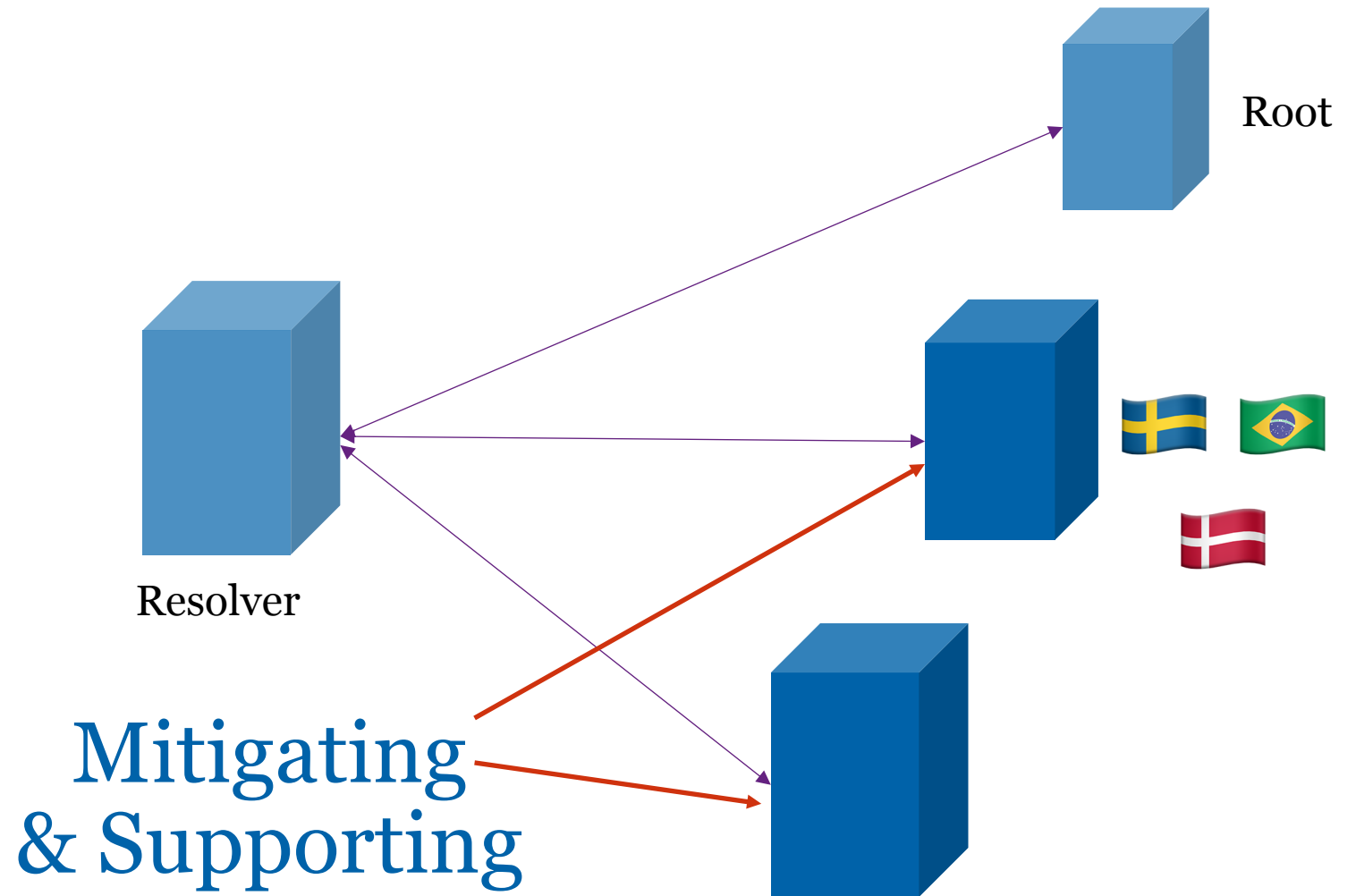
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# Mitigating & Supporting

Müller, M., Chung, T., Mislove, A., & van Rijswijk-Deij, R. (2019). Rolling with confidence: Managing the complexity of DNSSEC operations.

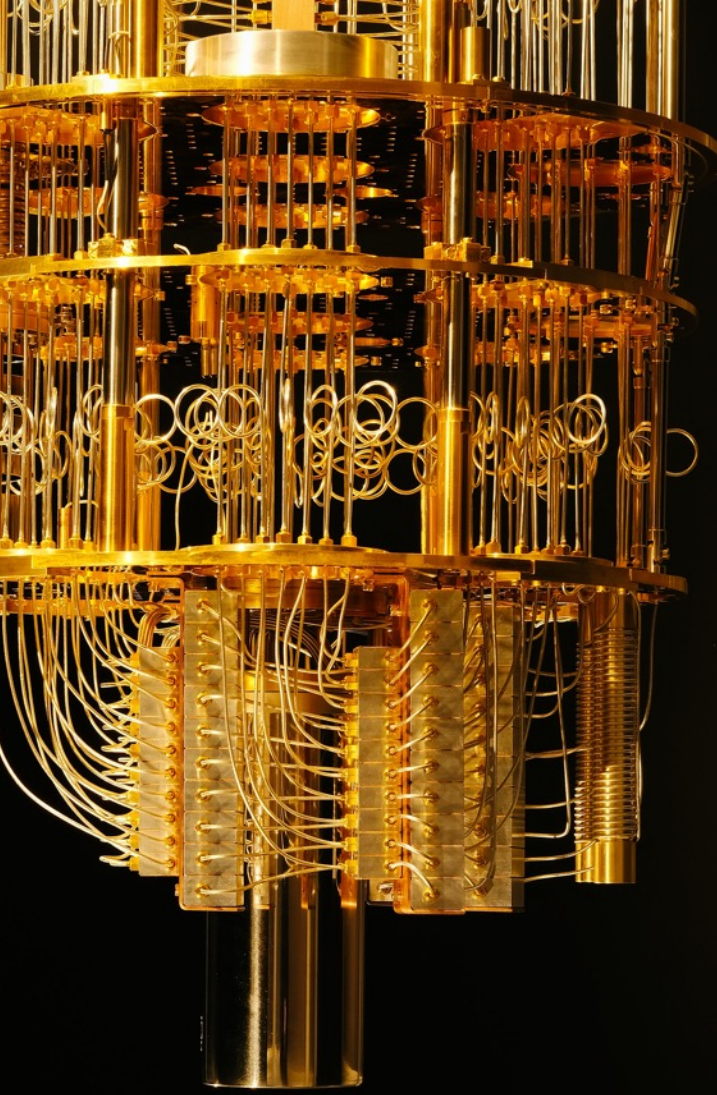


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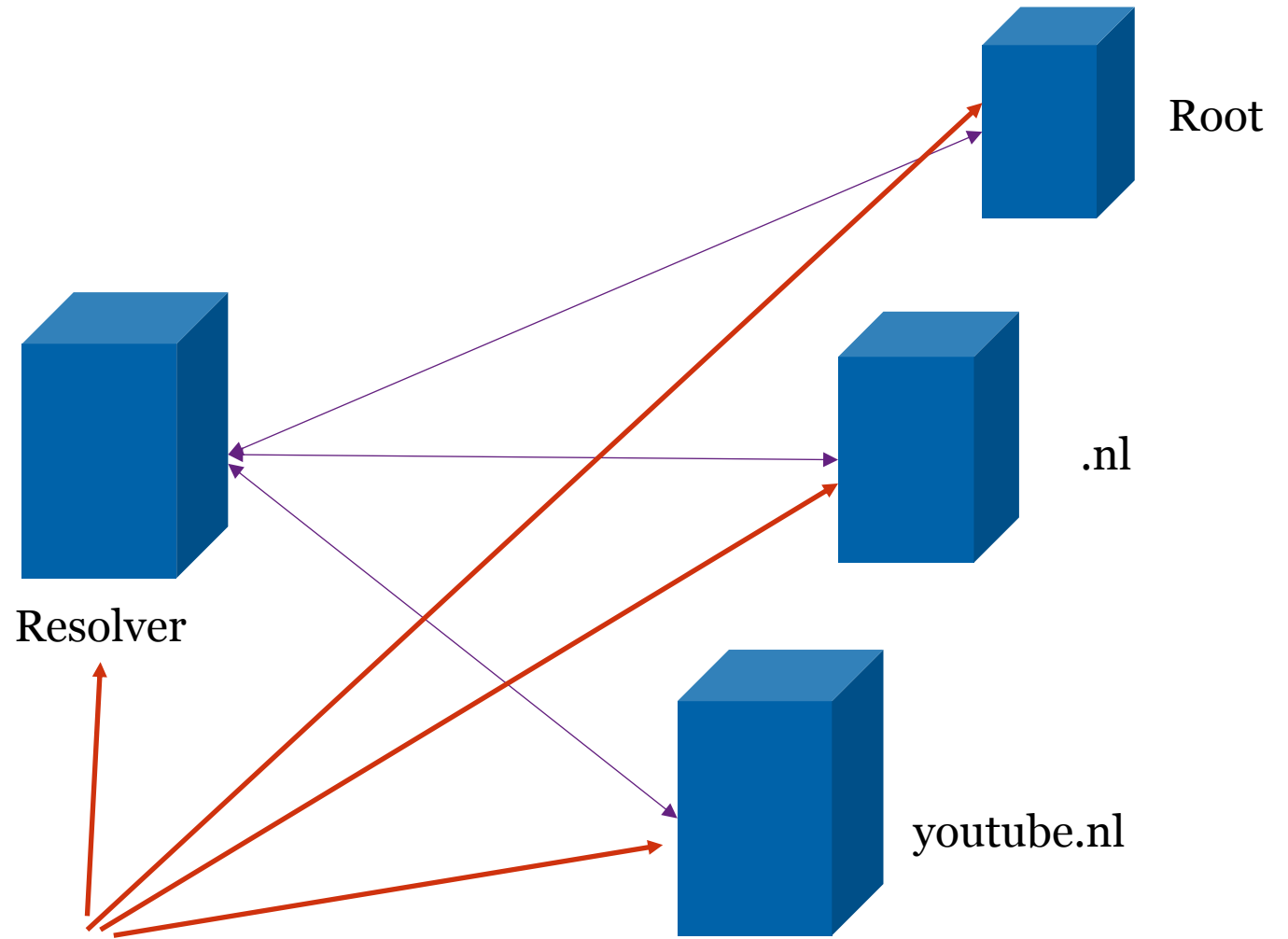
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Müller, M., de Jong, J., van Heesch, M., Overeinder, B., & van Rijswijk-Deij, R. (2020). Retrofitting post-quantum cryptography in internet protocols: a case study of DNSSEC.



Looking Ahead

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Is DNSSEC ready for the future?

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# The Pros and Cons of a Joint PhD

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# Some words to students that just get started:

- It's normal not to know how the next years will look like
- Be open to change
- Look for collaboration
- Share your ideas

*Volg ons*

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Q&A

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