LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

MNM TEAM

Hidden Conflicts in Software-Defined Networks

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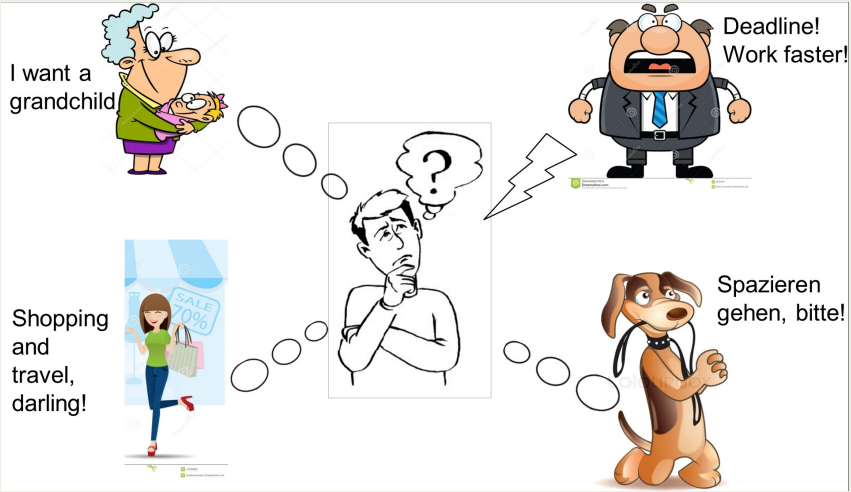
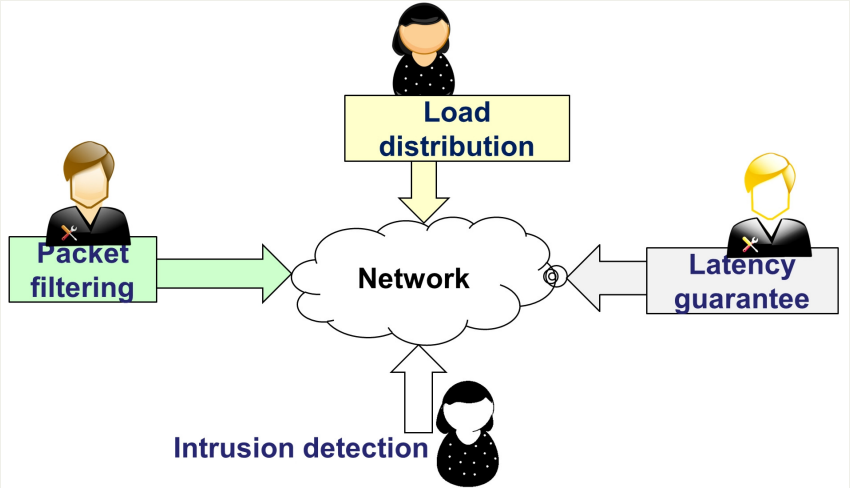
ACOMP 2019

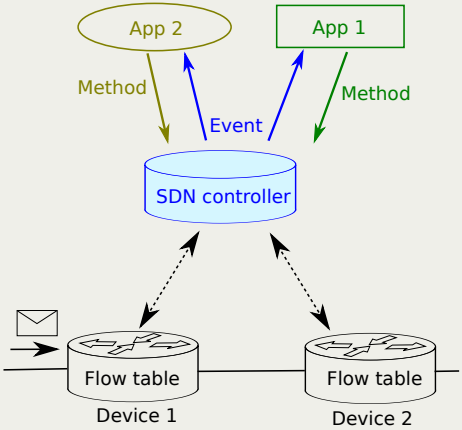
Conflict in Real Life



Conflict in Network Management



SDN Architecture



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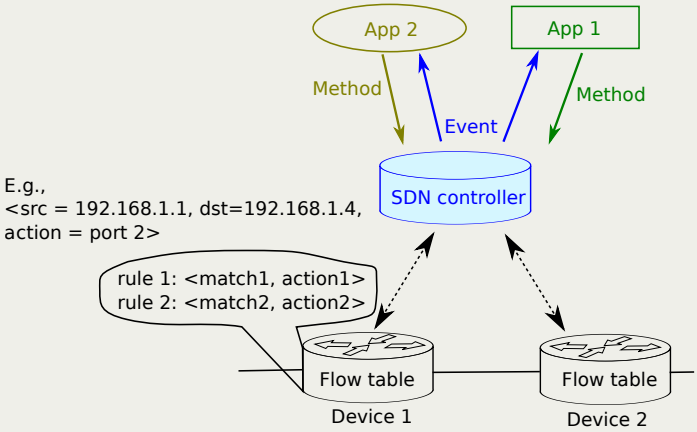
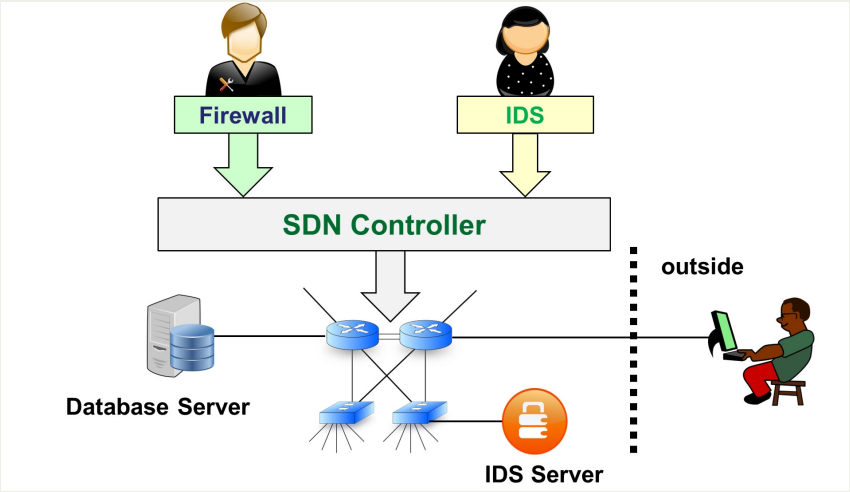


Conflict in SDN



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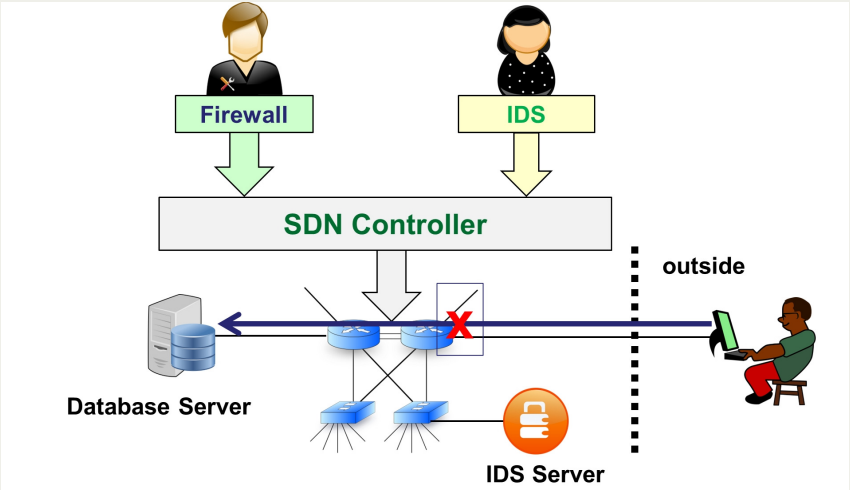

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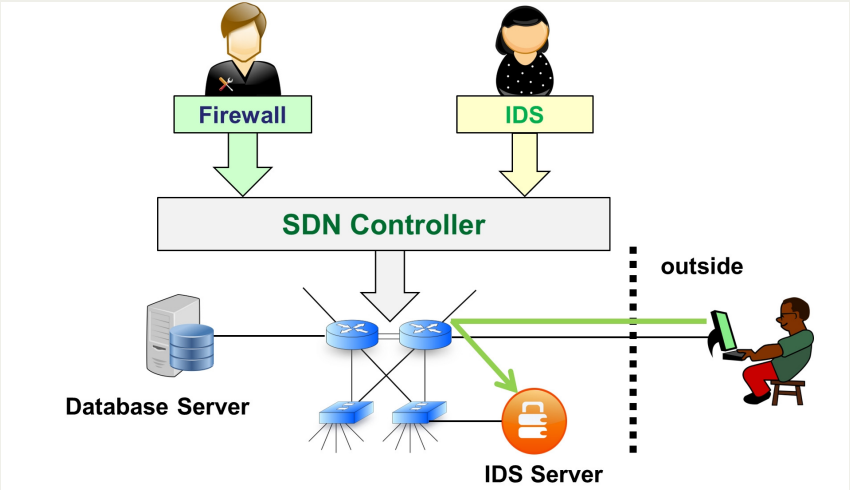
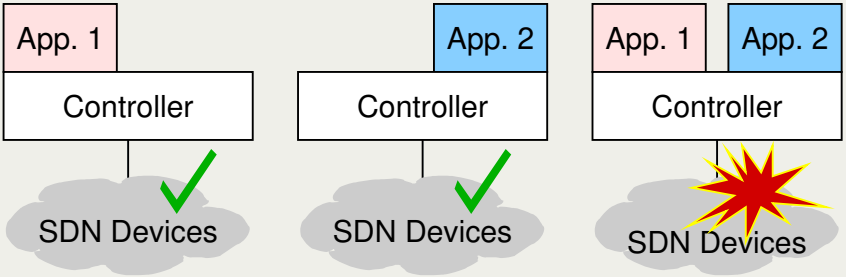
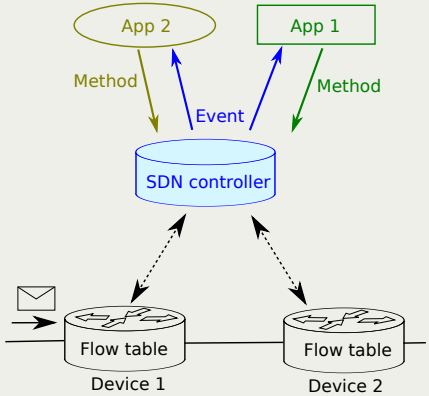


Conflict Definition



An Example of Hidden Conflicts



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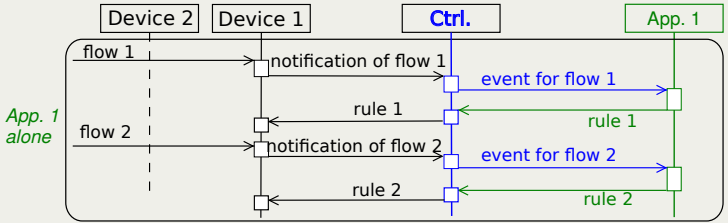

rule : <match, action>

Example:
rule 1: <src = 192.168.1.1, dst = 192.168.1.4, action=port 1>
rule 2: <src = 192.168.1.2, dst = 192.168.1.4, action=port 2>
rule 1234: <src = any , dst = 192.168.1.4, action=port 1>

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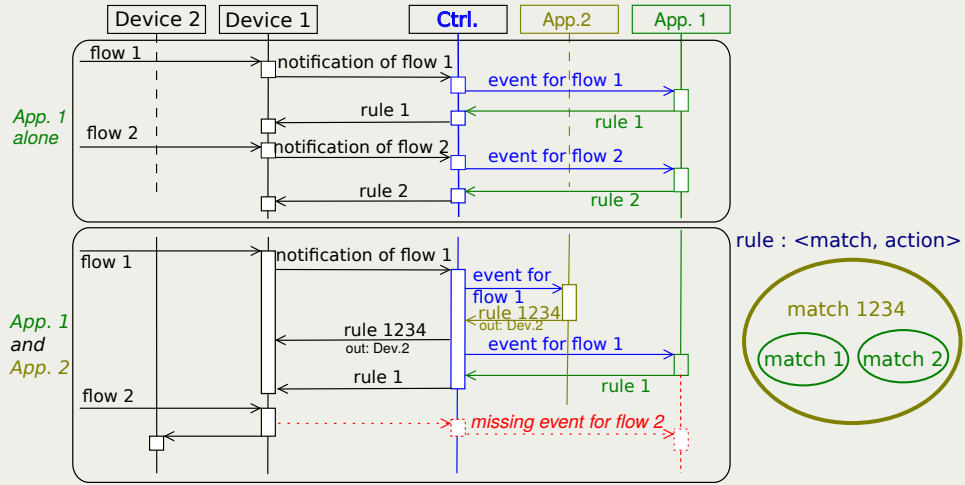

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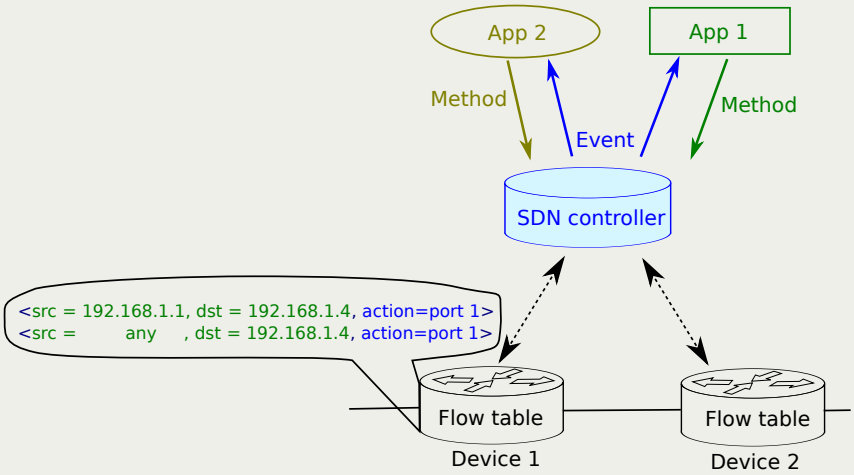

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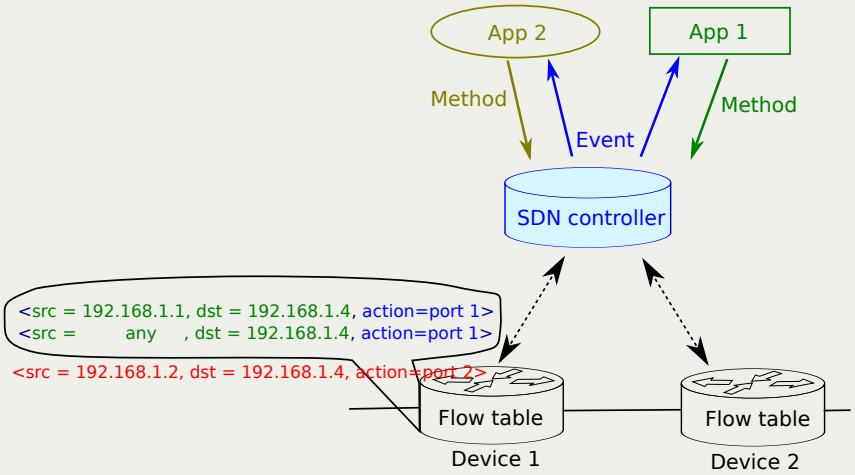


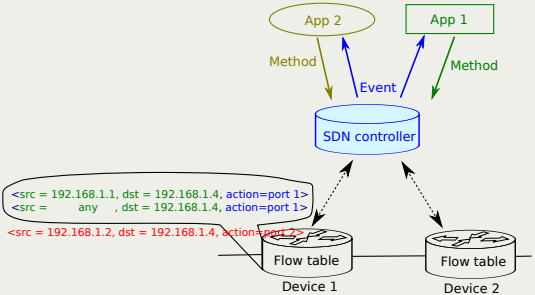
Hidden Conflicts

Properties:

- causes are hidden, flow table alone reveals no problem
- requires insight into the mechanics of the control plane

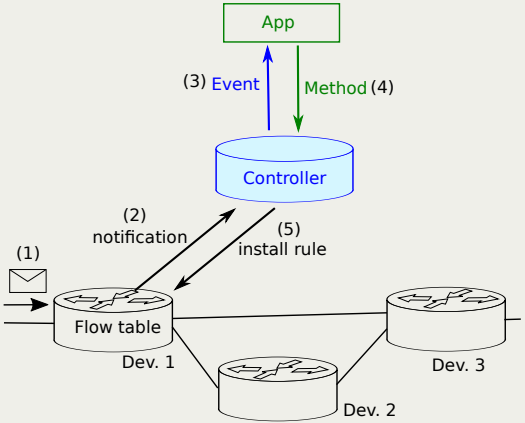
Consequences:

- suppression of events
- application failure



Hidden Conflicts' Causes

1. Event suppression by local handling
2. Event suppression by changes to paths
3. Action suppression by modification of packets
4. Undue trigger
5. Tampering with event subscription



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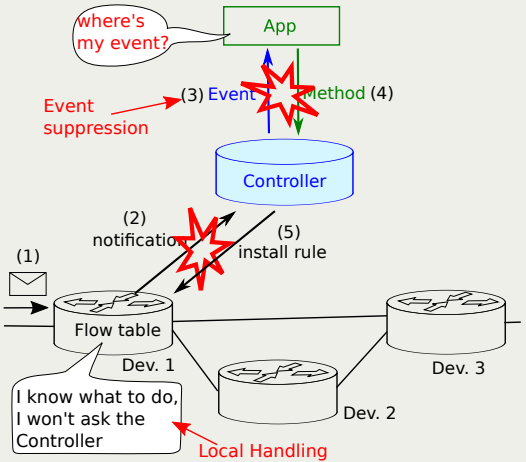

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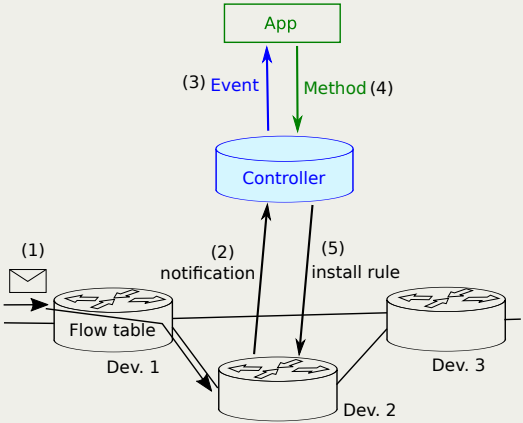

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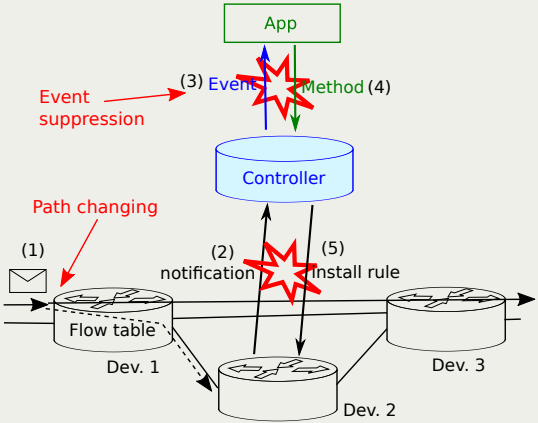

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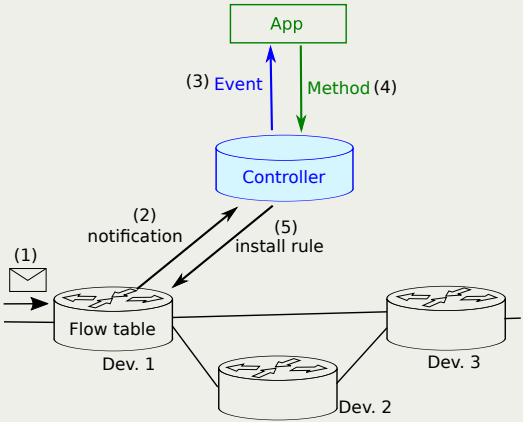

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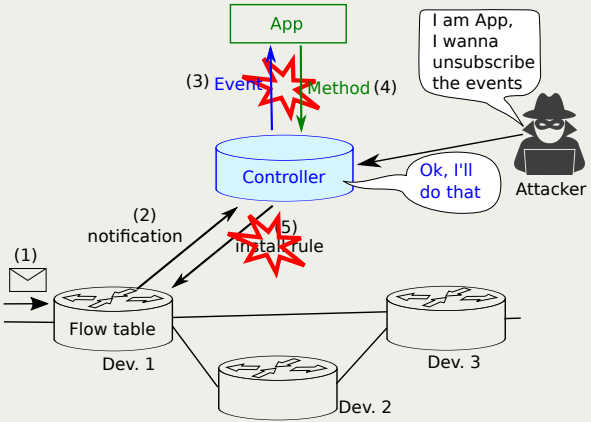
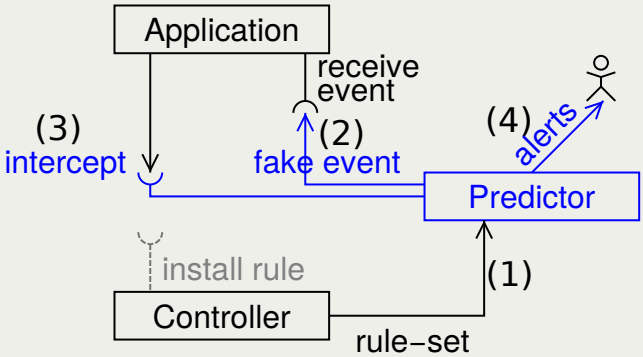
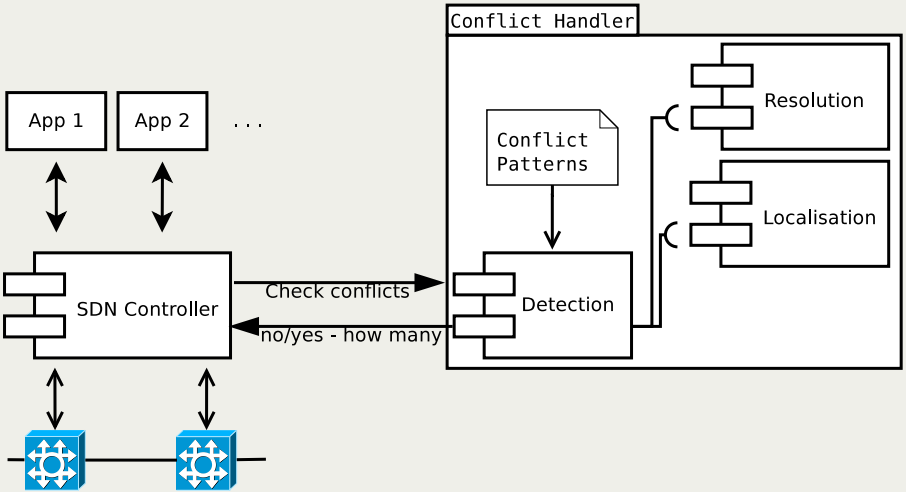


Future Work: Detection of Hidden Conflicts



Future Work: Conflict Detection



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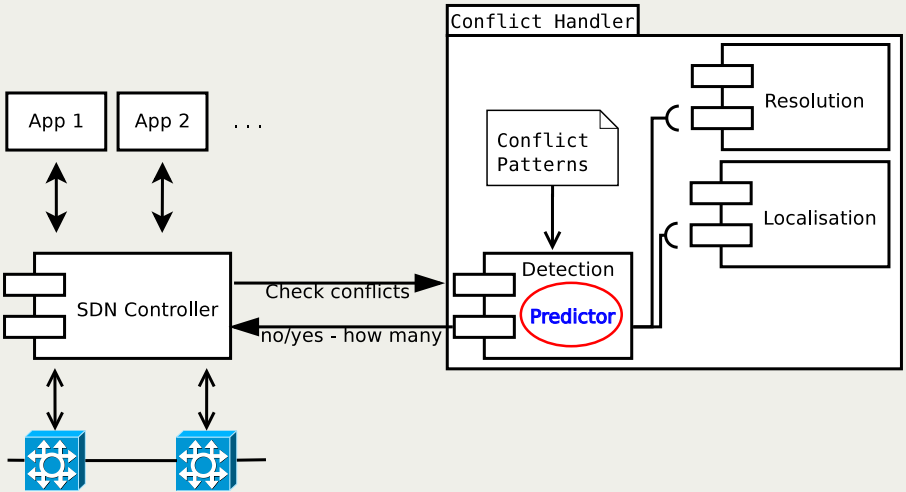

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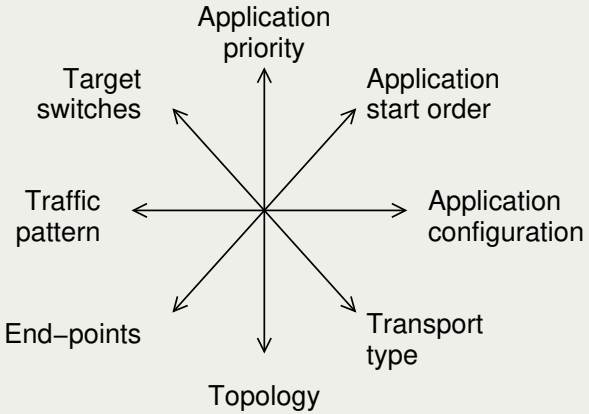
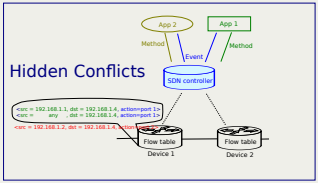


Take-away



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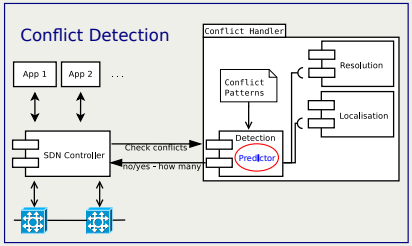

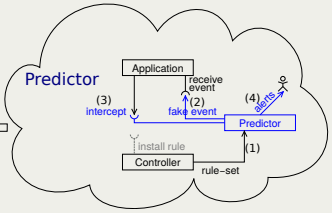

Backup

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compare with iptables, ip routings, different mechanisms

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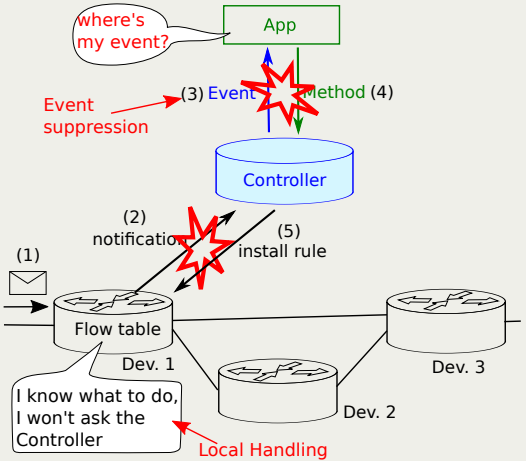

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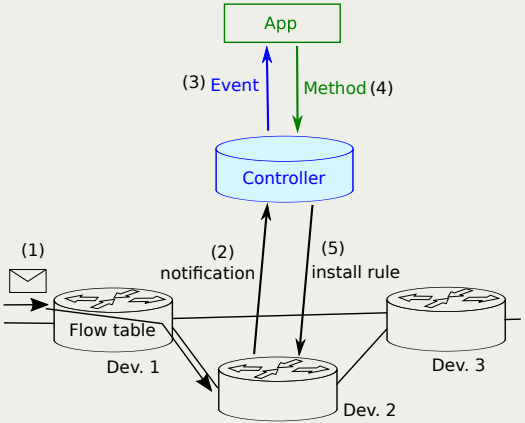

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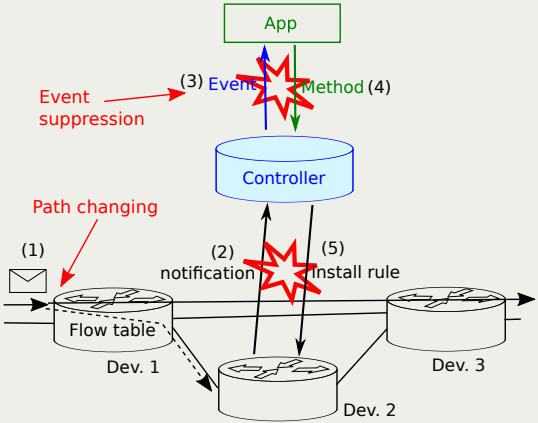

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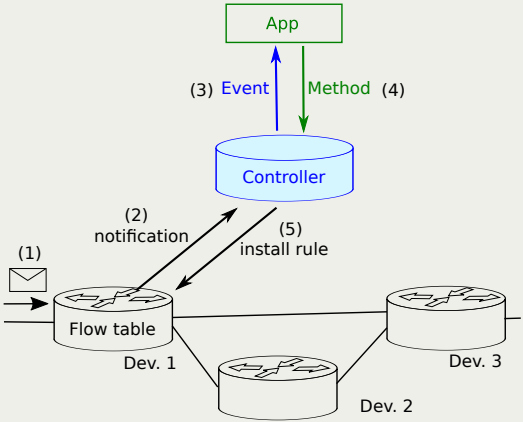

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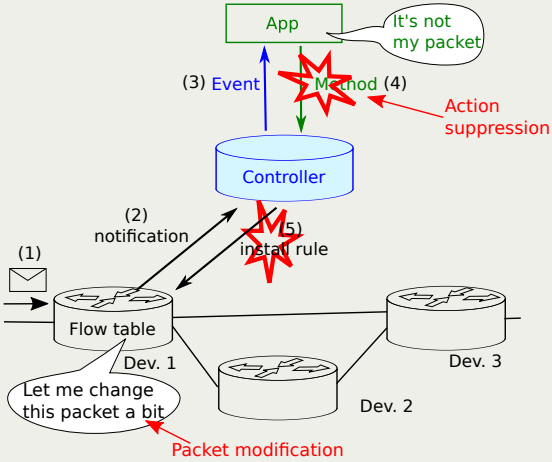

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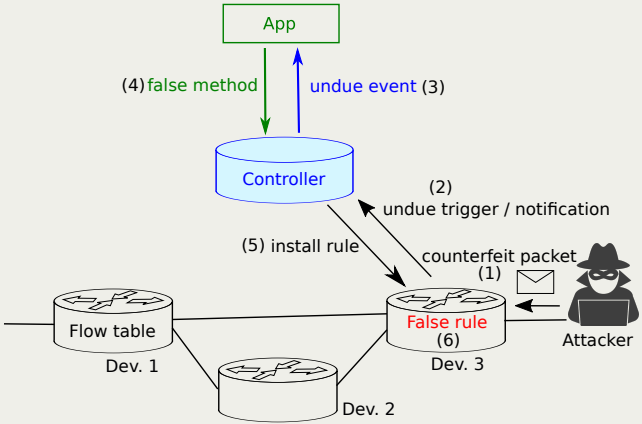

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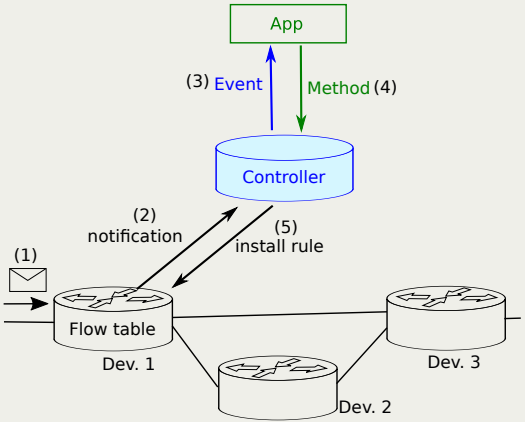

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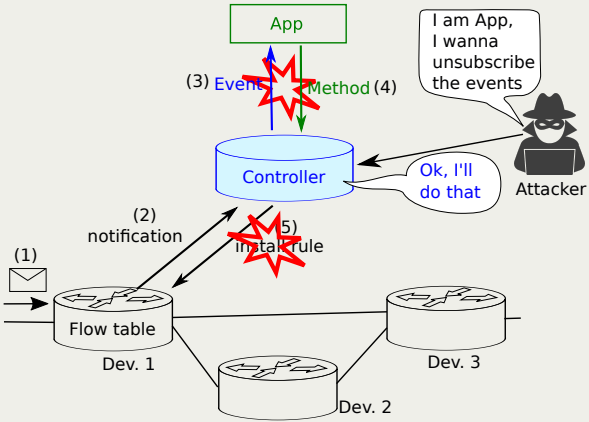

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Advancement

- existing conflict classes: generalization, redundancy...
- new conflict class: hidden conflict
- hidden conflicts' causes and a speculative method to detect them.