

Maintain consistency of inter-domain routing and forwarding

draft-cheng-idr-inter-domain-consistency-00

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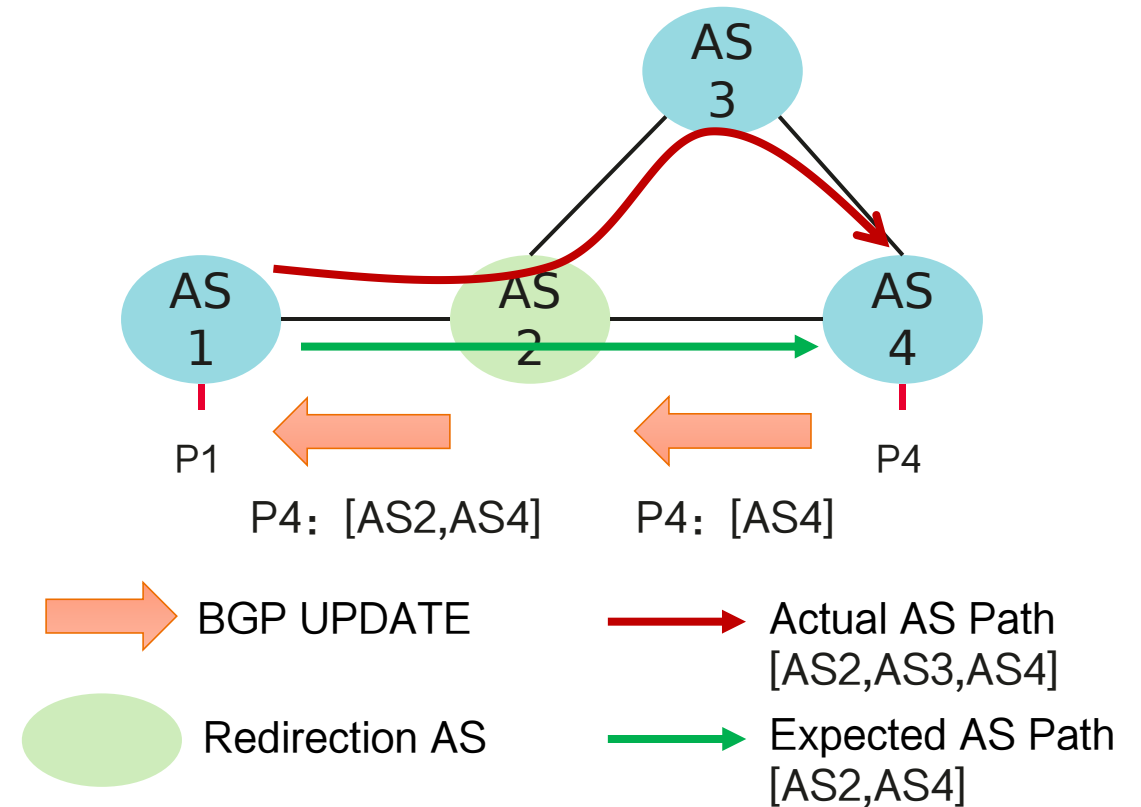
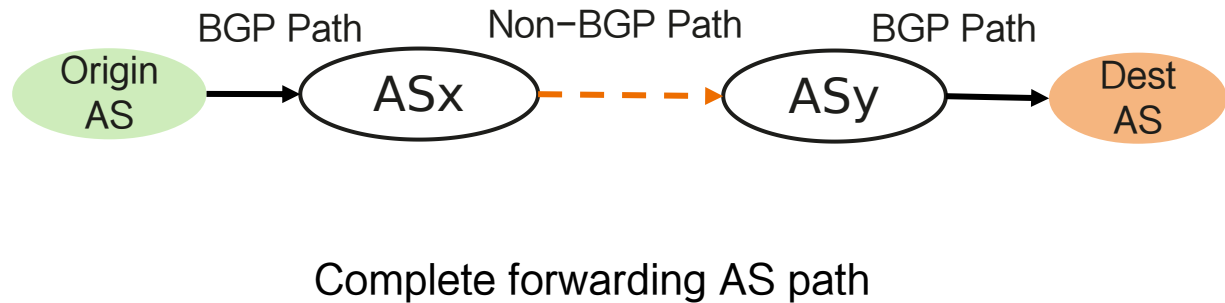
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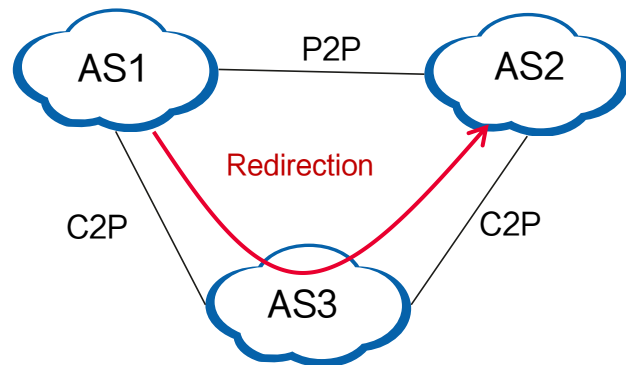
Inconsistent inter-domain routing and forwarding

- AS_PATH attribute of BGP UPDATE records the AS number that it has passed through
- The actual forwarding AS path is usually different with the AS_PATH in BGP UPDATE
- The origin AS, maybe any AS, does not see the actual forwarding AS path from the BGP announcement

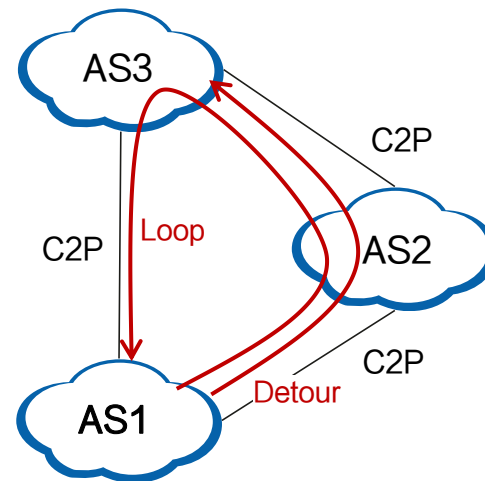


The risk of the inconsistency

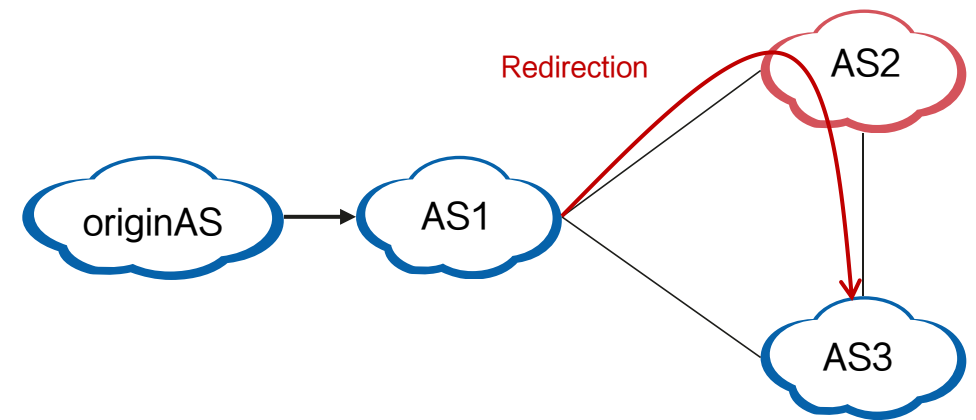
- Traffic blackhole
- Loop/Detour
- Malicious AS
- Non-optimal route



Traffic blackhole



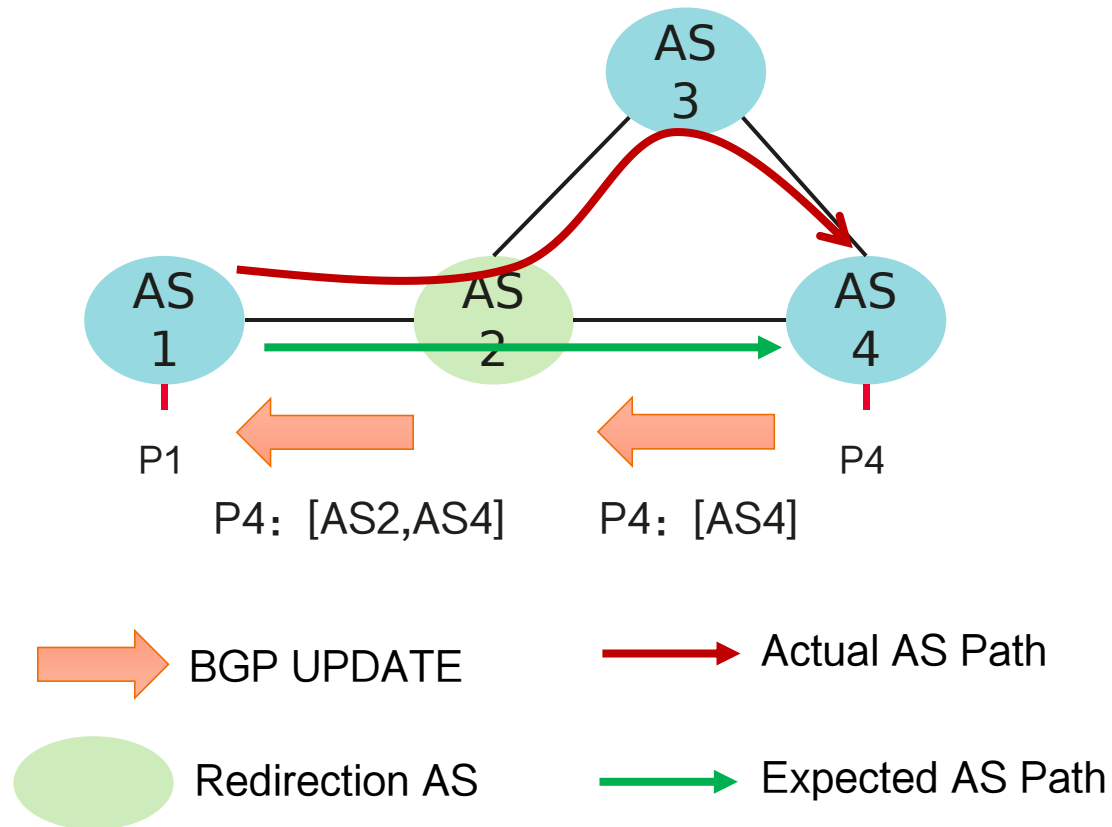
Loop/Detour



Malicious AS

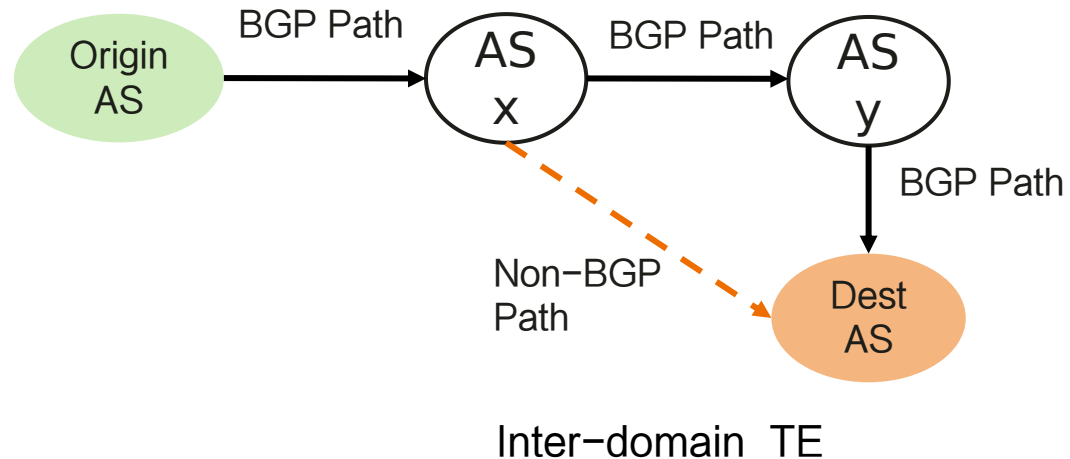
What results in the inconsistency?

- Inter-domain traffic Redirection
 - > No control plane/routing protocol awareness



What results in the inconsistency?

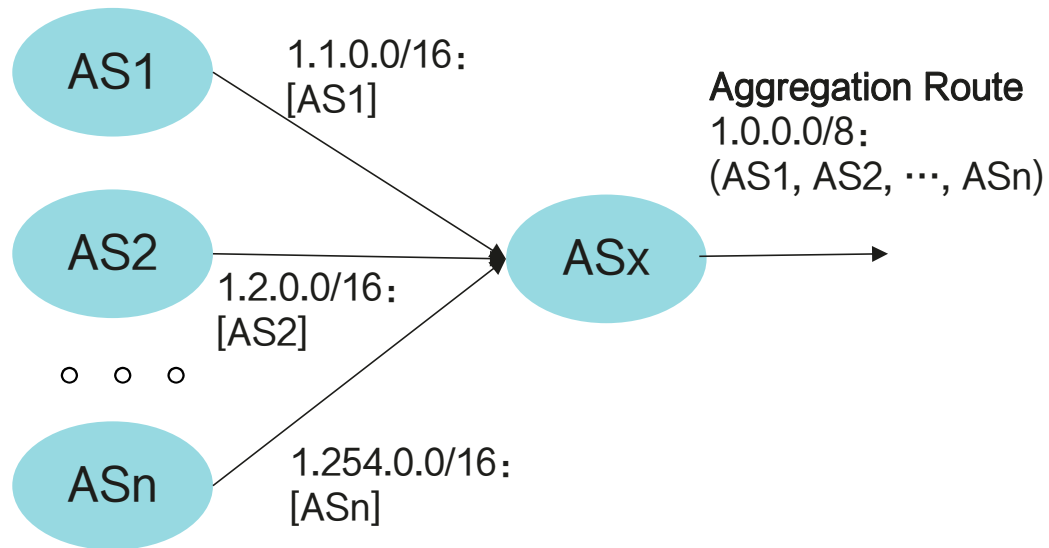
- Traffic engineering protocols
 - > Such as MPLS, SR



What results in the inconsistency?

- Route aggregation

>The ordered AS_Sequence is converted to the unordered AS_SET



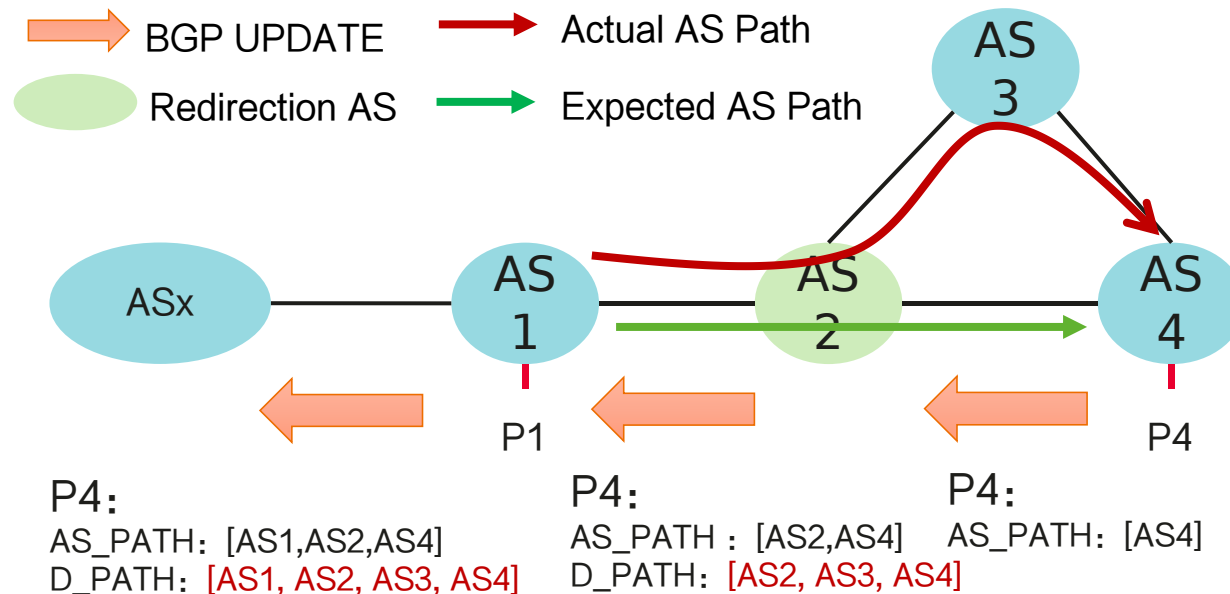
How to maintain consistency of inter-domain routing and forwarding

- Obtaining deviation AS paths
- Advertising the deviation path

How to maintain consistency of inter-domain routing and forwarding

• Obtaining deviation AS paths

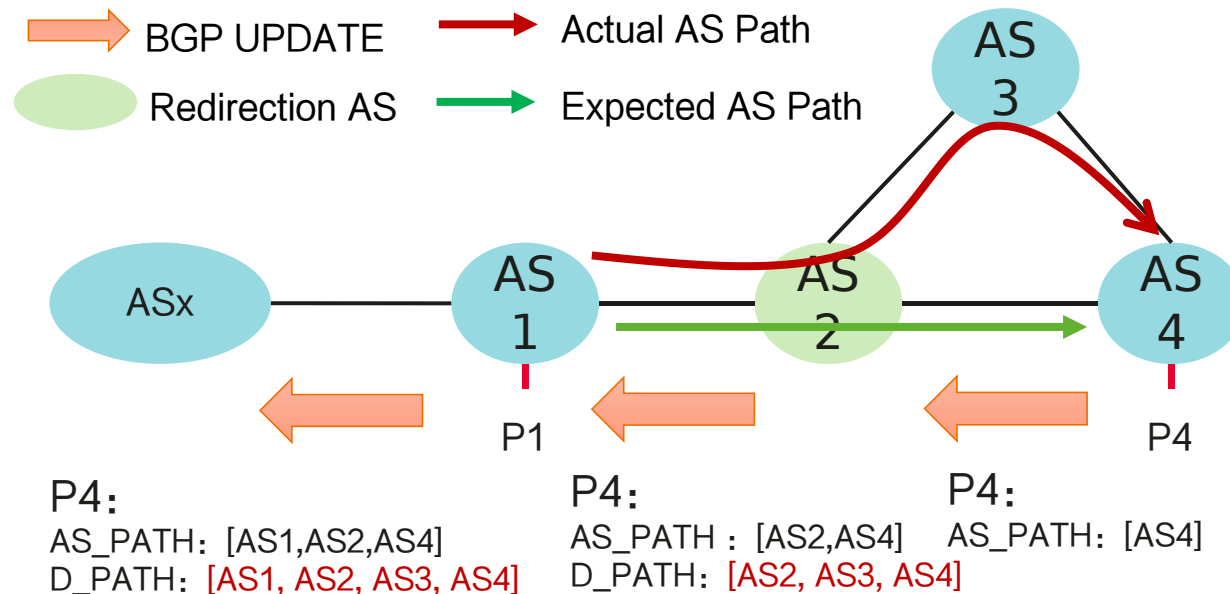
- > Acquire the next-hop AS and the destination prefix of the redirection rule.
- > Look up the AS_PATH in Adj_RIBs_In from the next-hop AS according to the destination prefix.



How to maintain consistency of inter-domain routing and forwarding

- Advertising the deviation path

- > The AS that generates the deviation AS path is obliged to check and advertise it to other ASes.
- > The deviation AS path and attributes of the specific flow should be included in BGP UPDATE



Benefits

- Visualization
- Troubleshooting
- Routing security
- Inter-domain TE

Next Steps

- Any questions or comments are welcomed
- Will refine the solutions in the future