

sidrops@IETF'98
Chicago, March 2017

draft-yossigi-rpkimaxlen-00

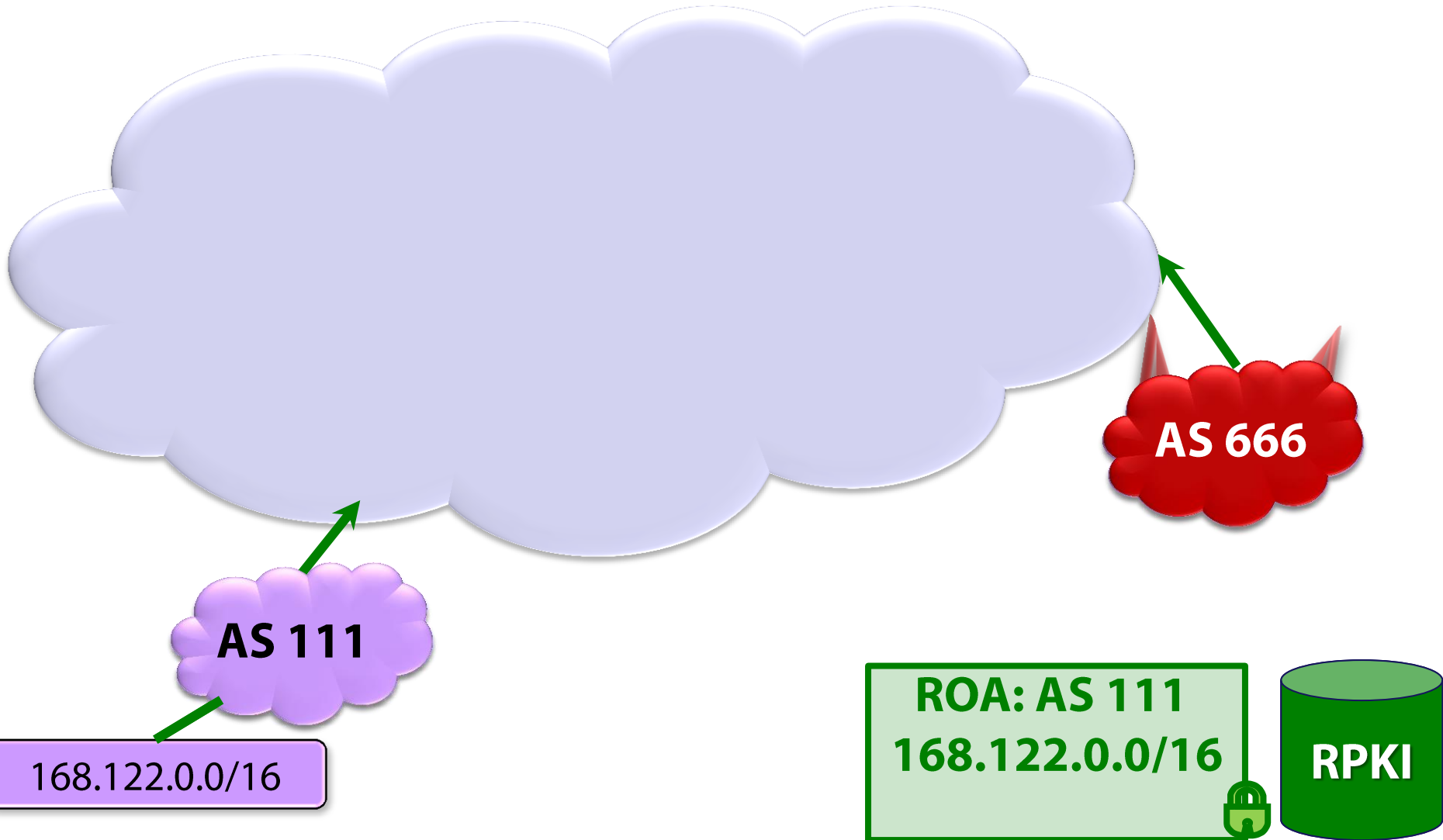
The use of maxLength in the RPKI

NIST

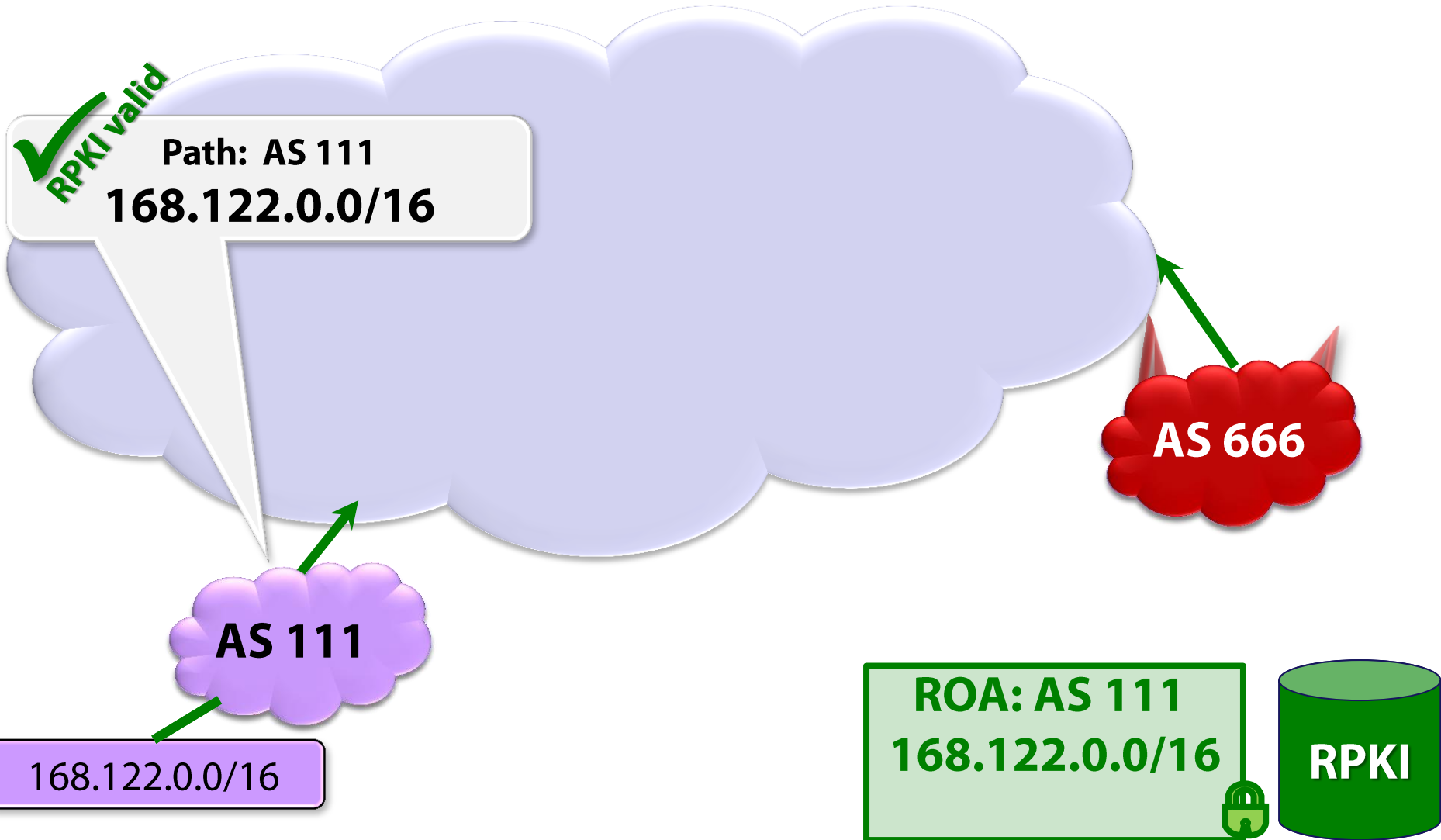
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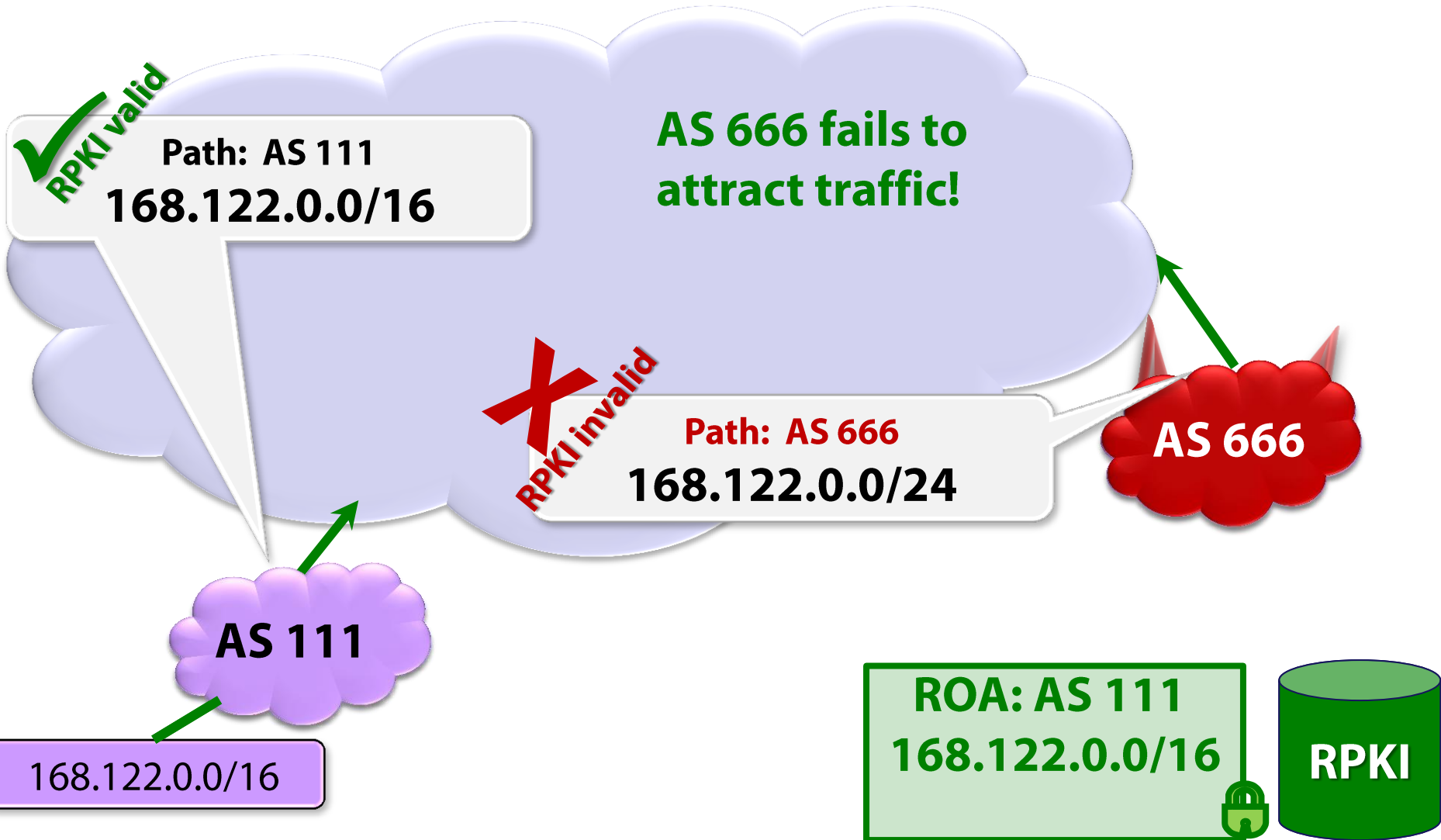
When used properly, the RPKI defeats subprefix hijacks



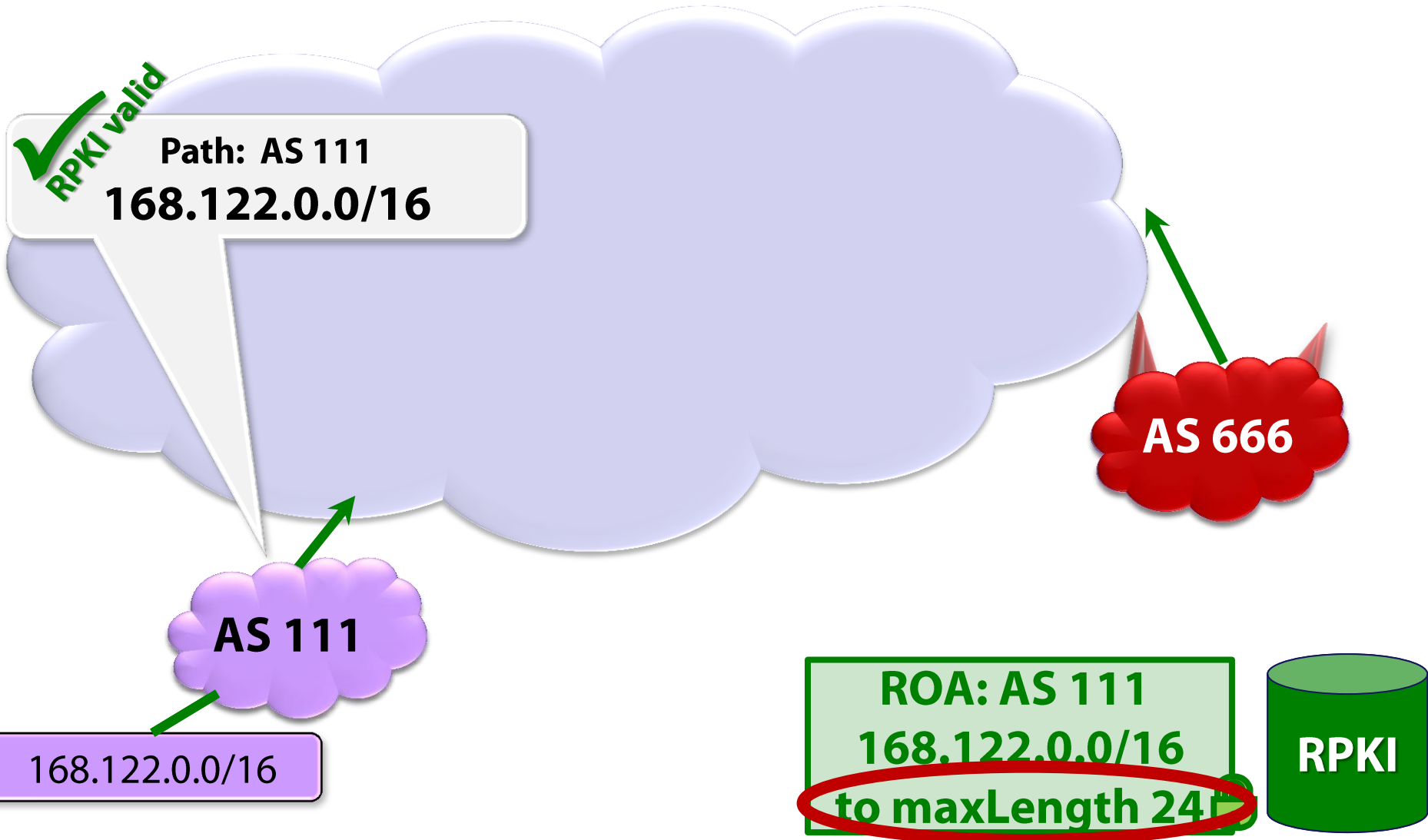
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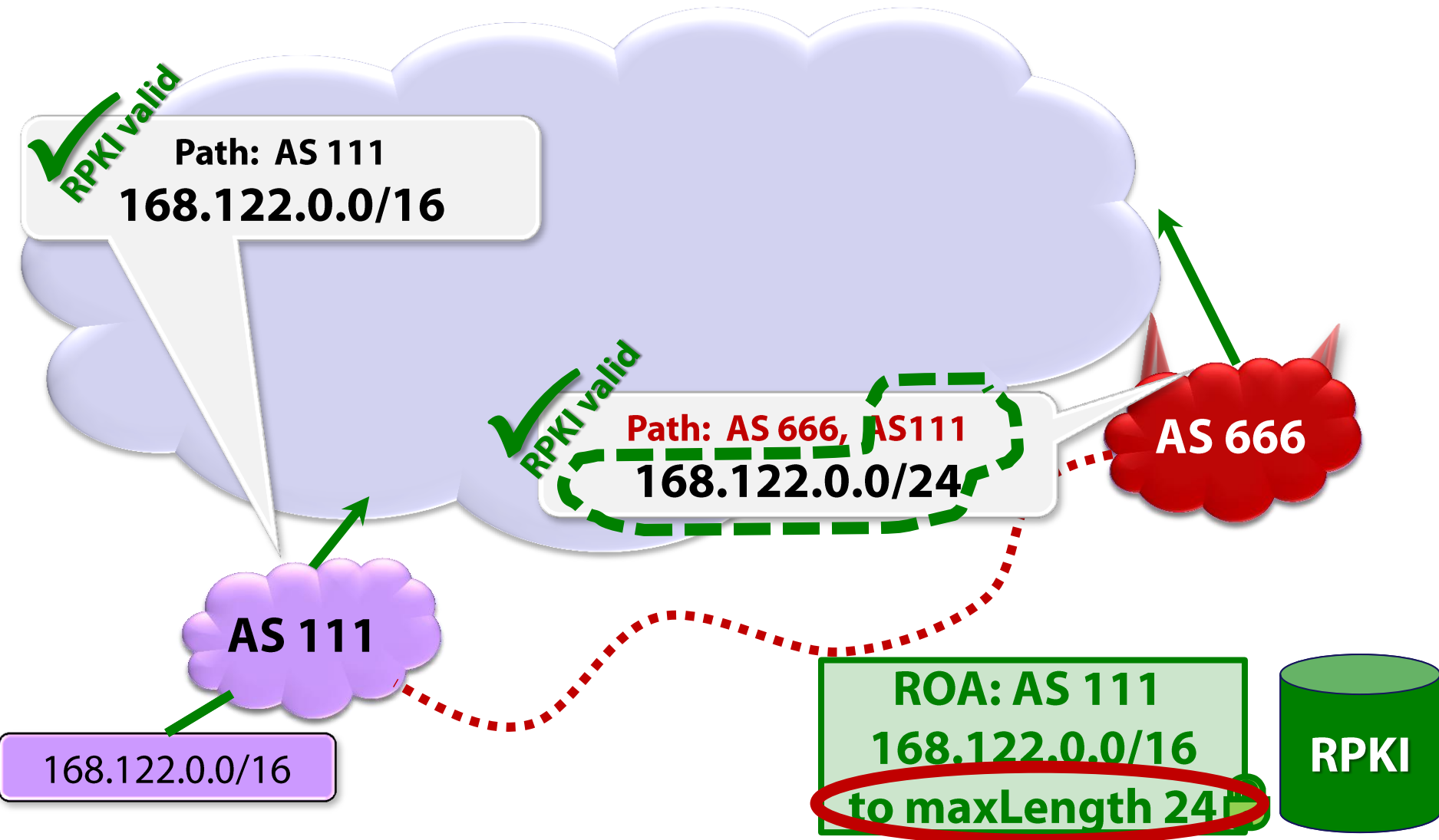
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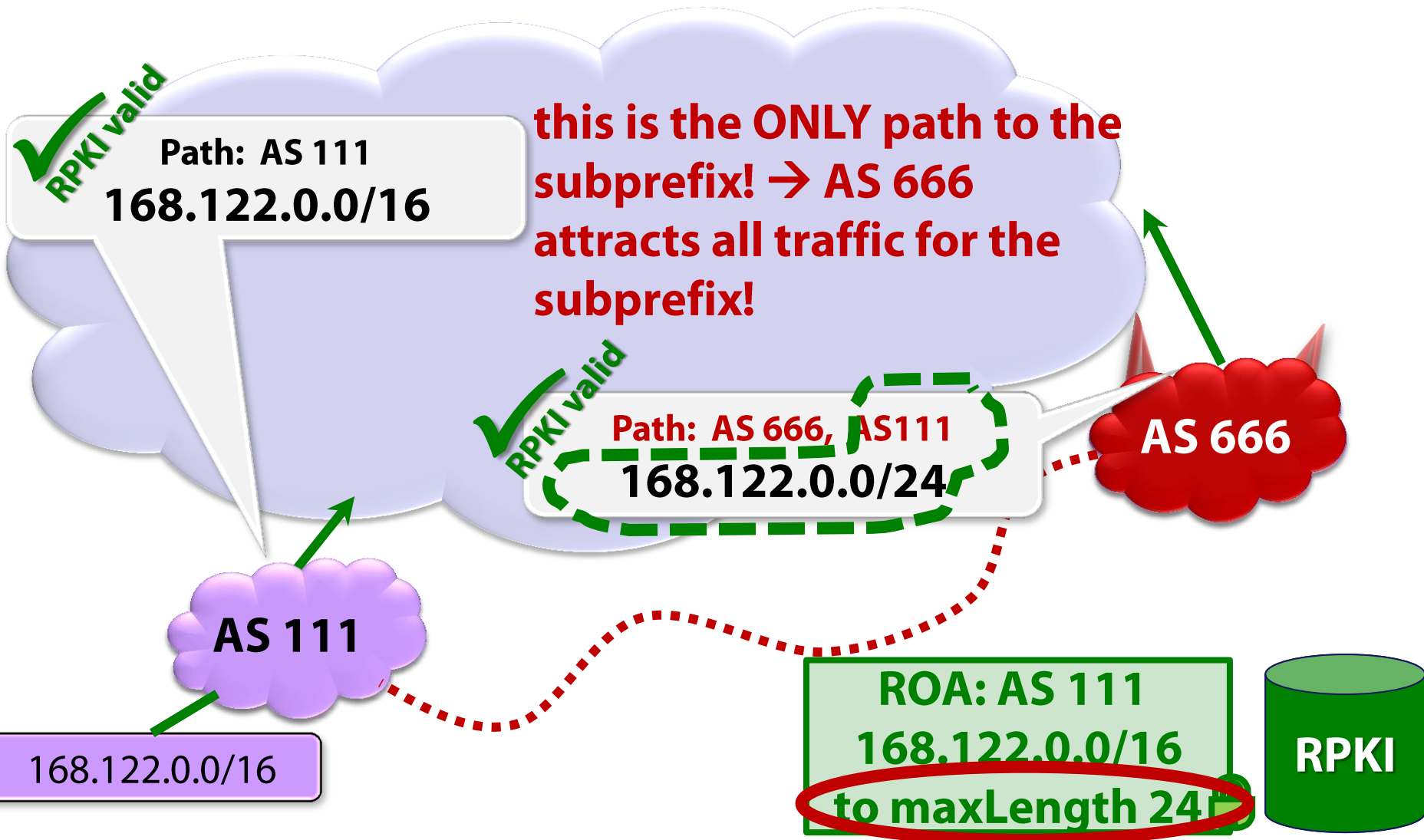
Loose maxLength → forged-origin **subprefix** hijack



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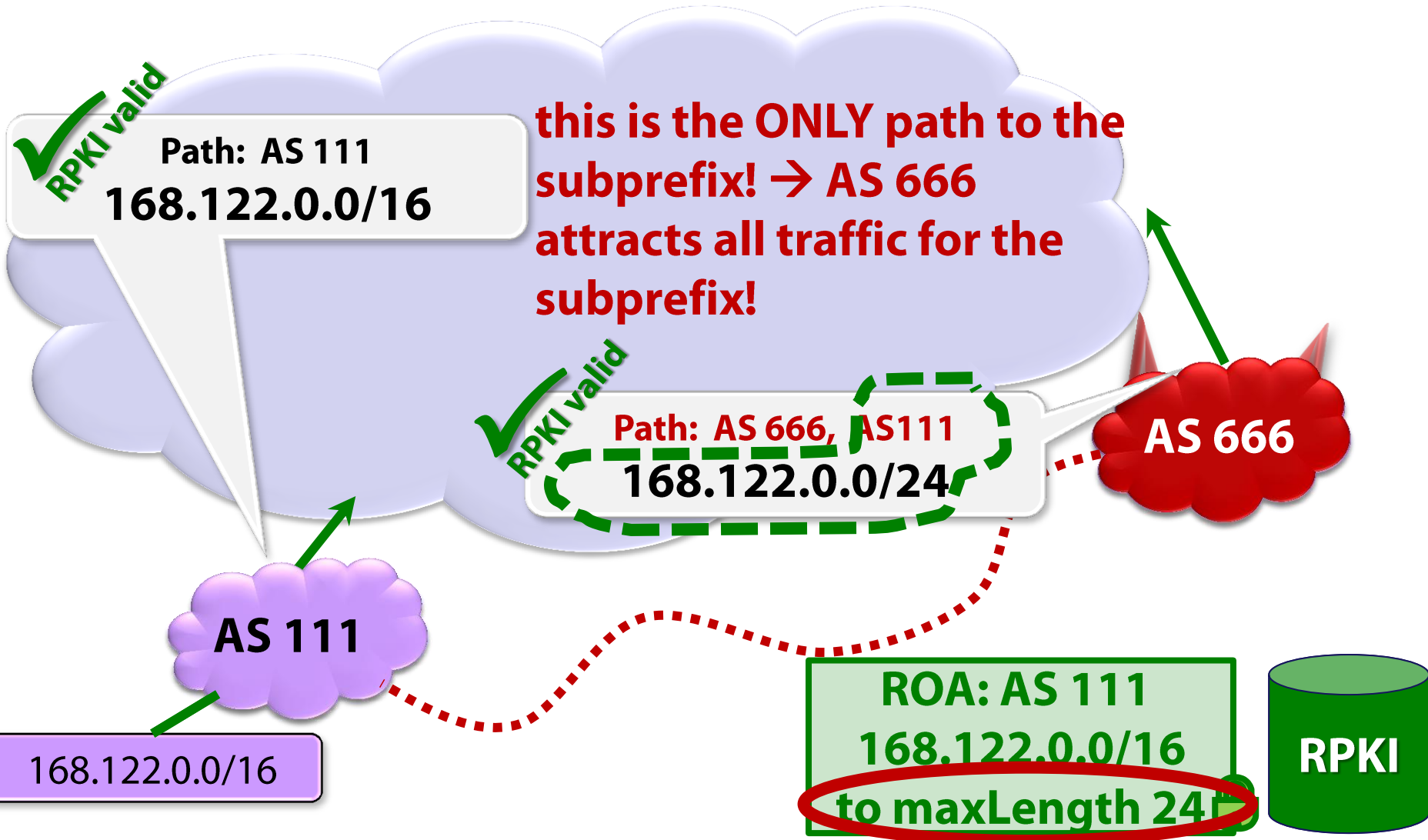


Loose maxLength → forged-origin **subprefix** hijack



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attack is highly effective because 168.122.0.0/24 is unannounced



maxLength misconfigurations are common!

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 - every subprefix of length **m** is announced in BGP
- 16% of the IP prefixes in ROAs have maxlength > prefixlen
- 89% of these are vulnerable to forged-origin subprefix hijacks
 - Even large providers are vulnerable

Recommendations

- As a best common practice:
 - Operators should refrain from using maxlength in ROAs. UIs should convey that.
 - ROAs should instead have explicit **lists** of prefixes authorized to be originated by a single AS
 - Whenever possible, use **minimal** ROAs where each listed prefix is originated in BGP.
- The RPKI already supports this. No extra ROAs needed.

Recommendations

- To reduce the number of RPKI filtering rules, we developed software that RPKI local caches can use to compress lists of prefixes from ROAs back to (AS, prefix, maxlength) tuples

https://github.com/yossigi/compress_roas

- See our technical report: <http://eprint.iacr.org/2016/1015.pdf>