Observing trends in Internet routing security

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November 01, 2024

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Internet Intelligence Lab

Key question

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Abuse
Misconfiguration

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- **Hijacking**
- **Fat-finger**
- **Route Leaks**

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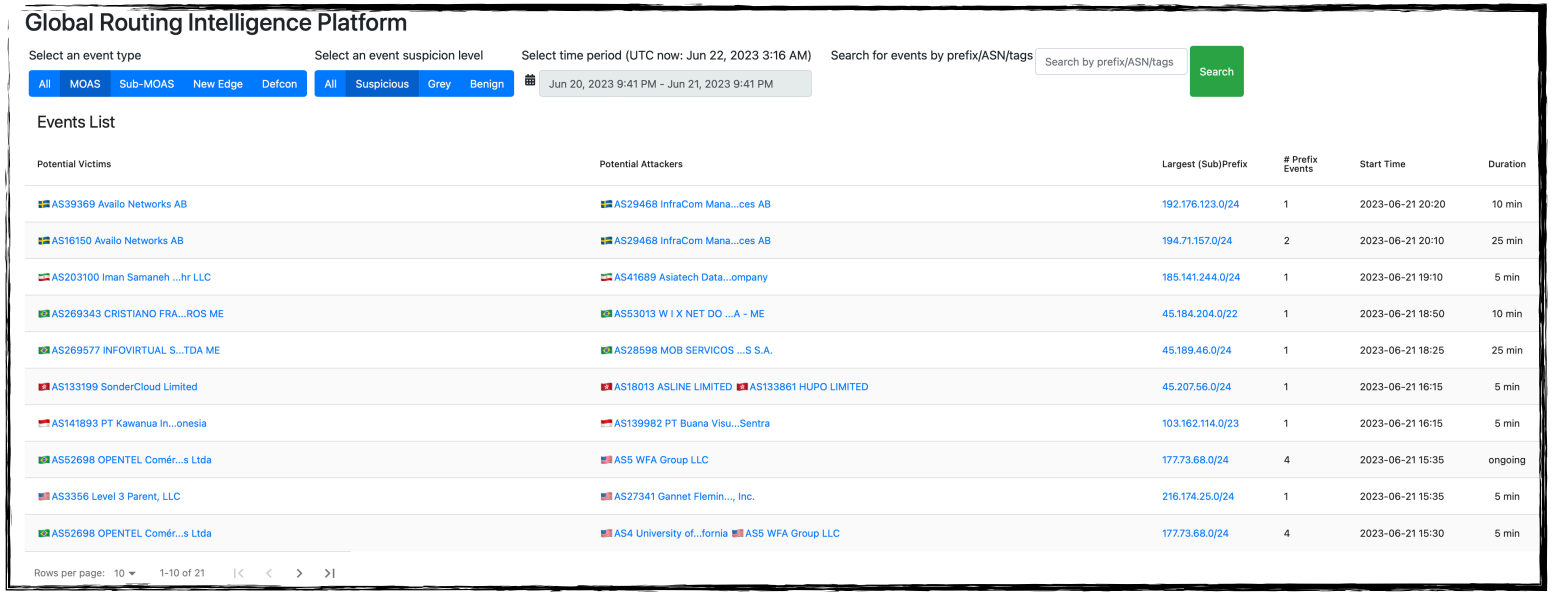
What do we know about routing incidents?

GRIP — *https://bgp.live (grip.inetintel.cc.gatech.edu)*

- Been around since ~2018 (CAIDA); running @ GATech since 2021
- Public dashboard + API; Open source
- Main BGP incidents datasource to the MANRS observatory
- Annotation and inference methods constantly improving
- Current status: We reprocessed the last 5 years to uncover trends



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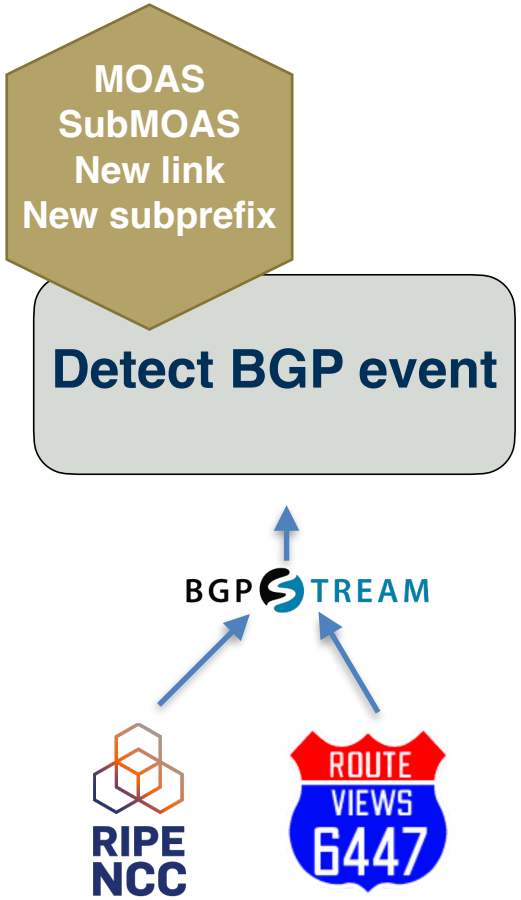
How does GRIP work?

- Target: *All* types of hijacking attacks and hijacking misconfigurations



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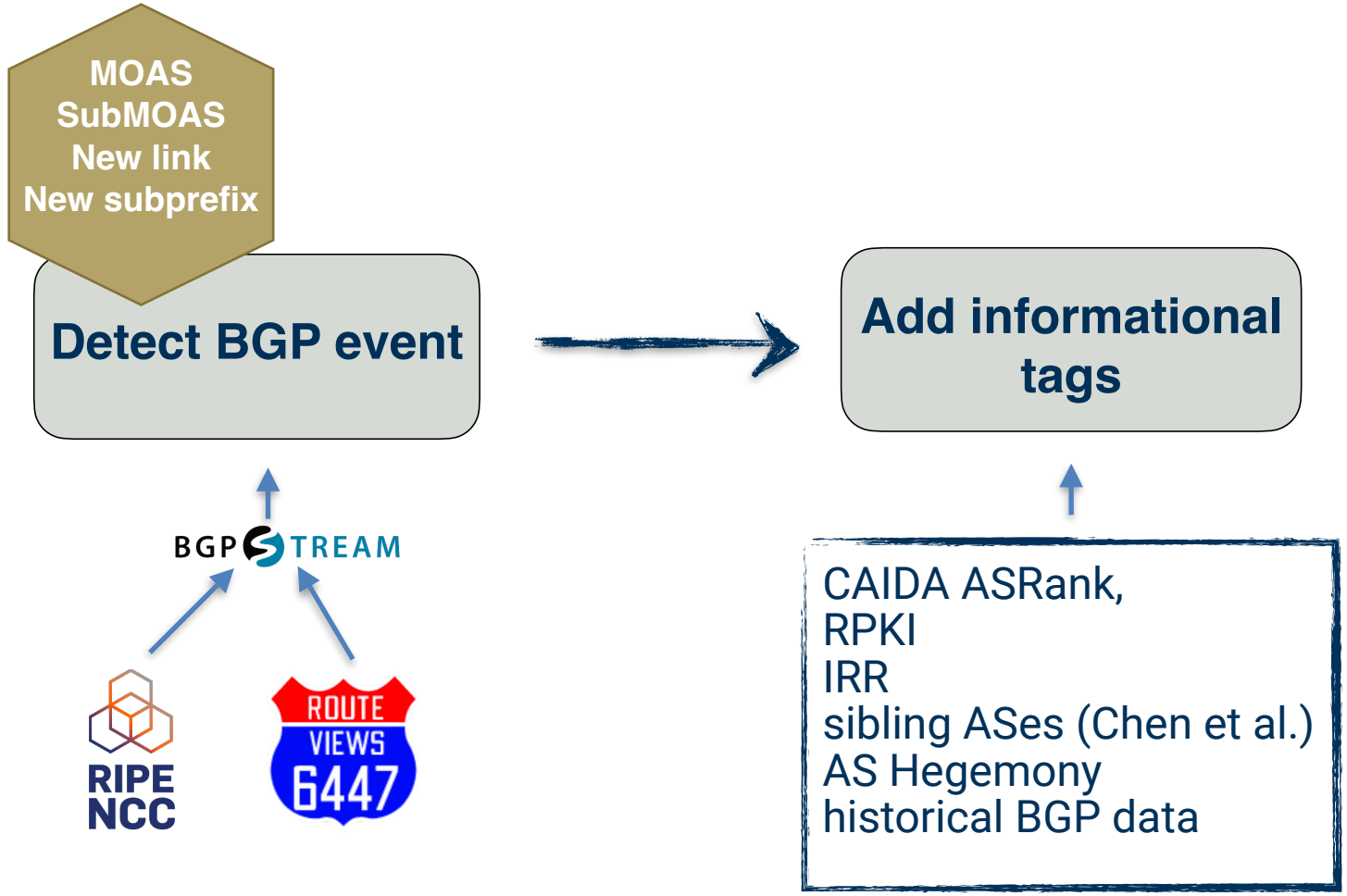

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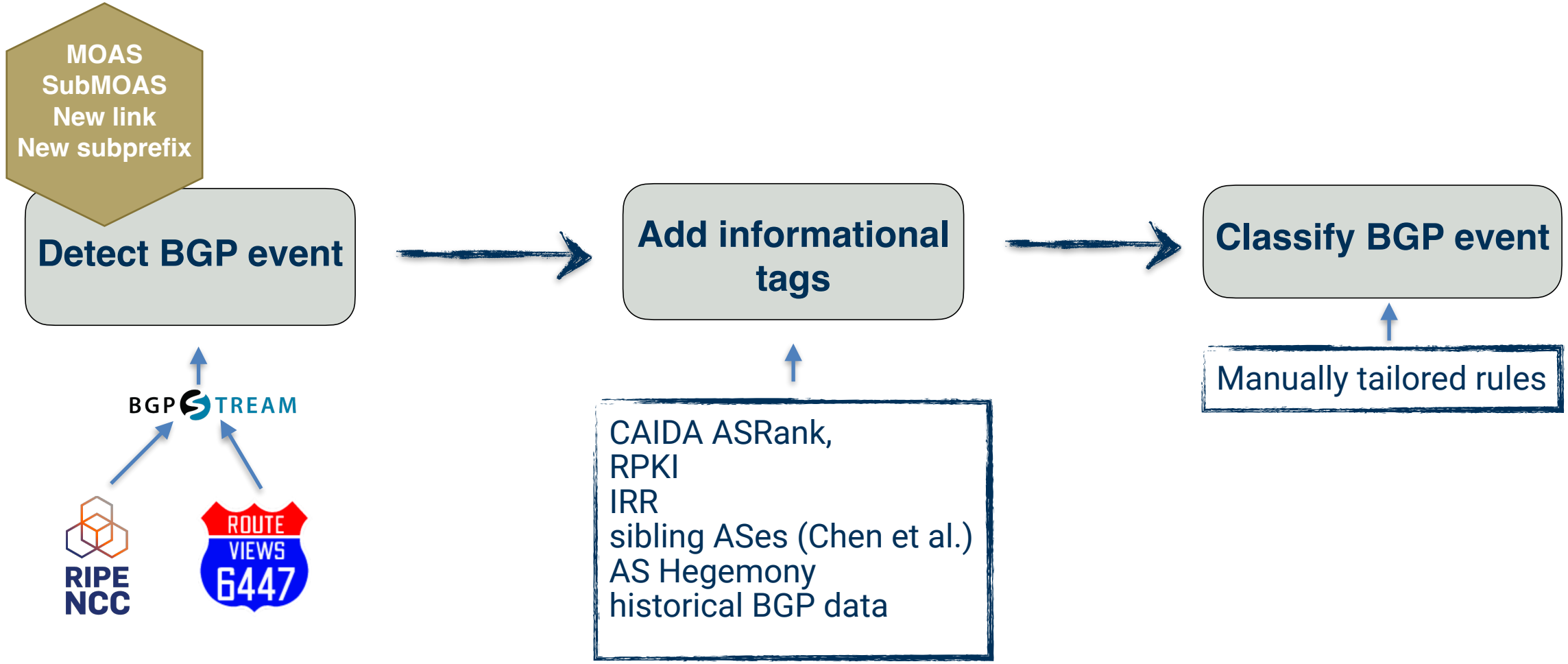

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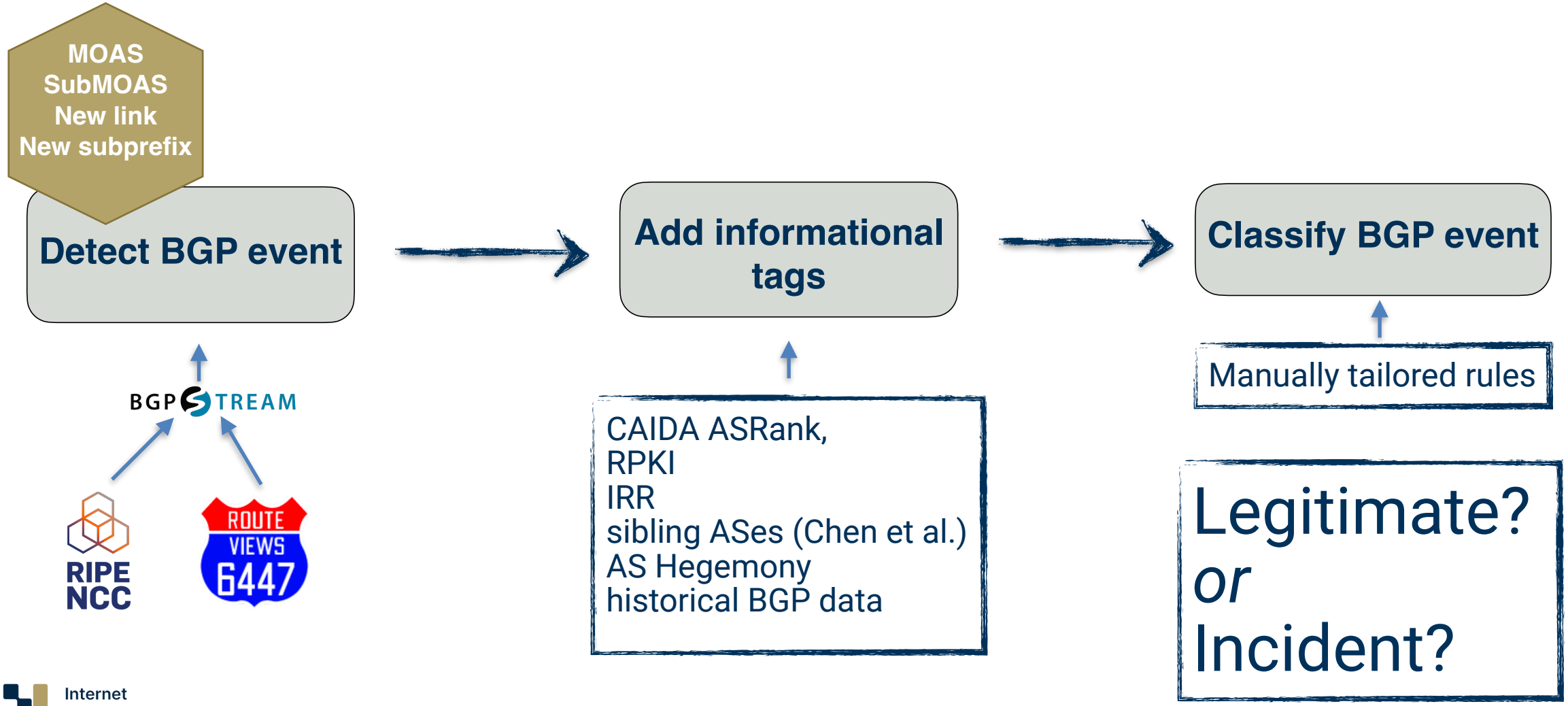


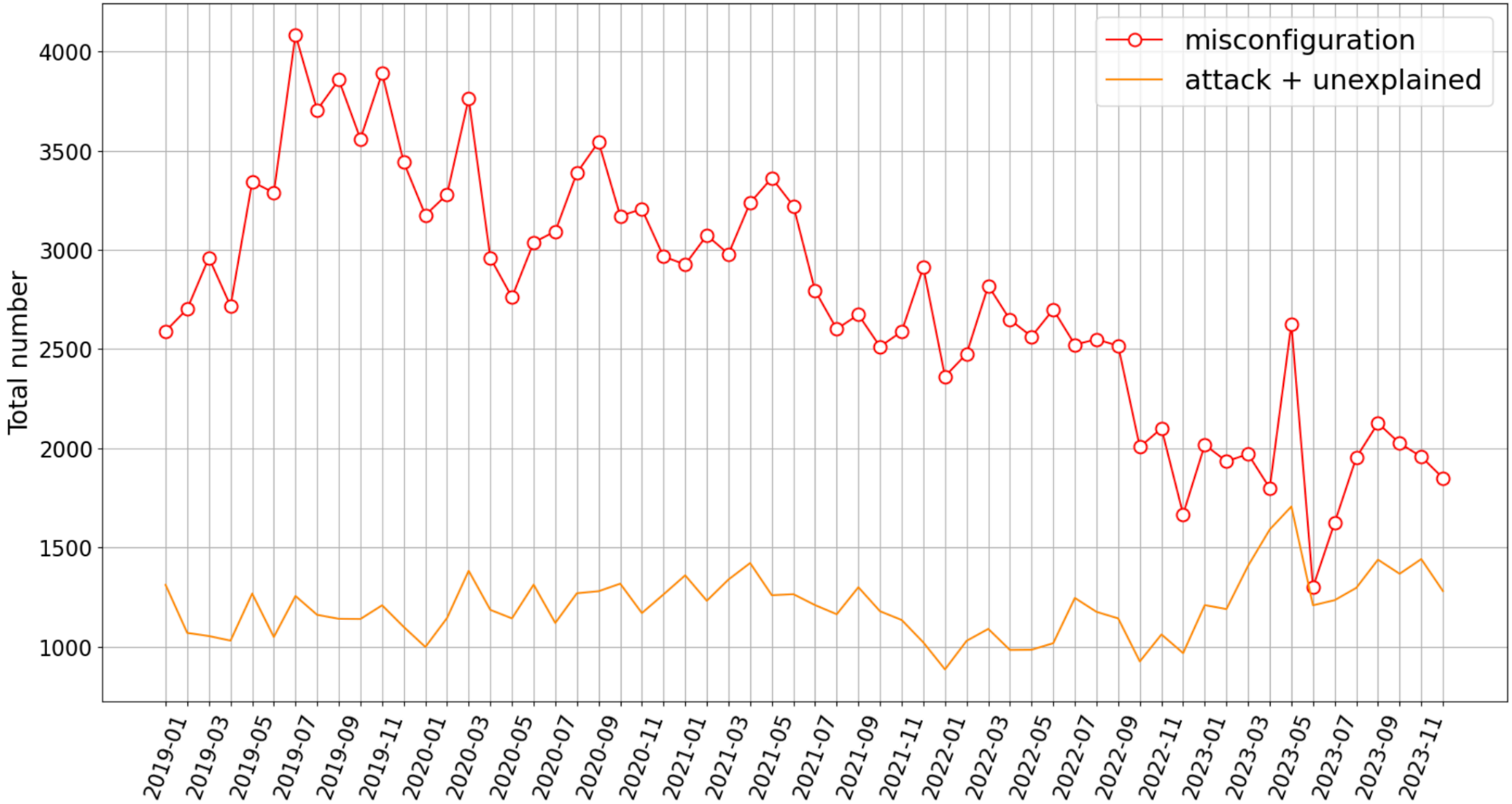
What have we observed so far?

Classification of events — where we are now

- We mark most of the events as legitimate [85%]
- Most incidents show misconfiguration patterns [10%]
  - Fat finger of prefix/ASN
  - AS path prepending mistake (e.g., *AS978, AS2* instead of *AS978, AS978*)
  - Related ASes but RPKI invalid …
- Many events w/ patterns of attacks [2%]
  - or misconfigs hard to diagnose → *E.g., RPKI invalid but owners failed to publish correct ROAs*
- Unable to explain several events [2%]

- **Legitimate 85%; ~280k/yr**
- **Incidents 15%; ~50k/yr**
  - Misconfigs 10%; 33k/yr
  - Attacks 2%; 7k/yr
  - Unexplained 2%; 7k/yr
  - Abnormal 1%; 3k/yr

Incidents



>> preliminary results <<

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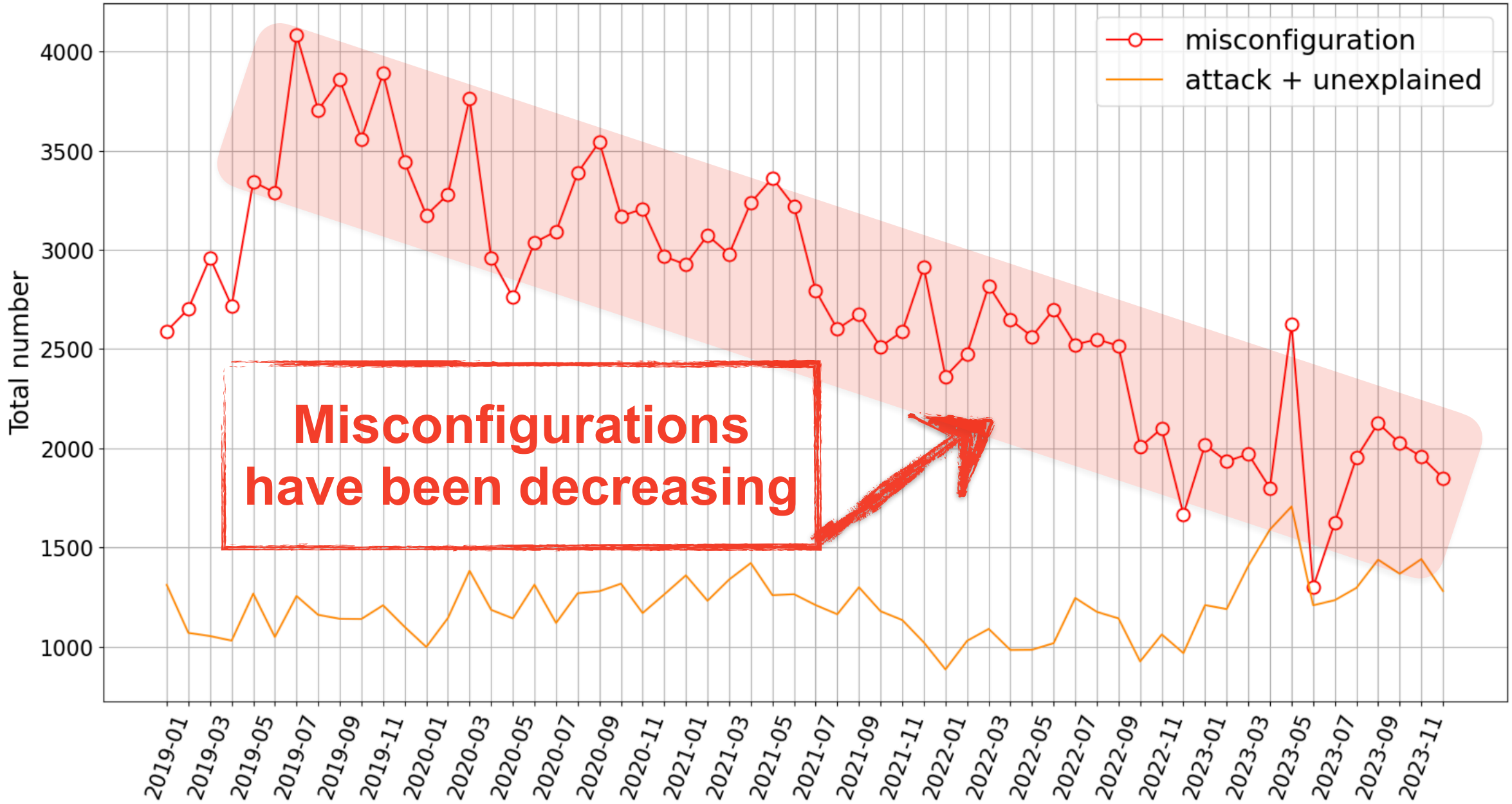

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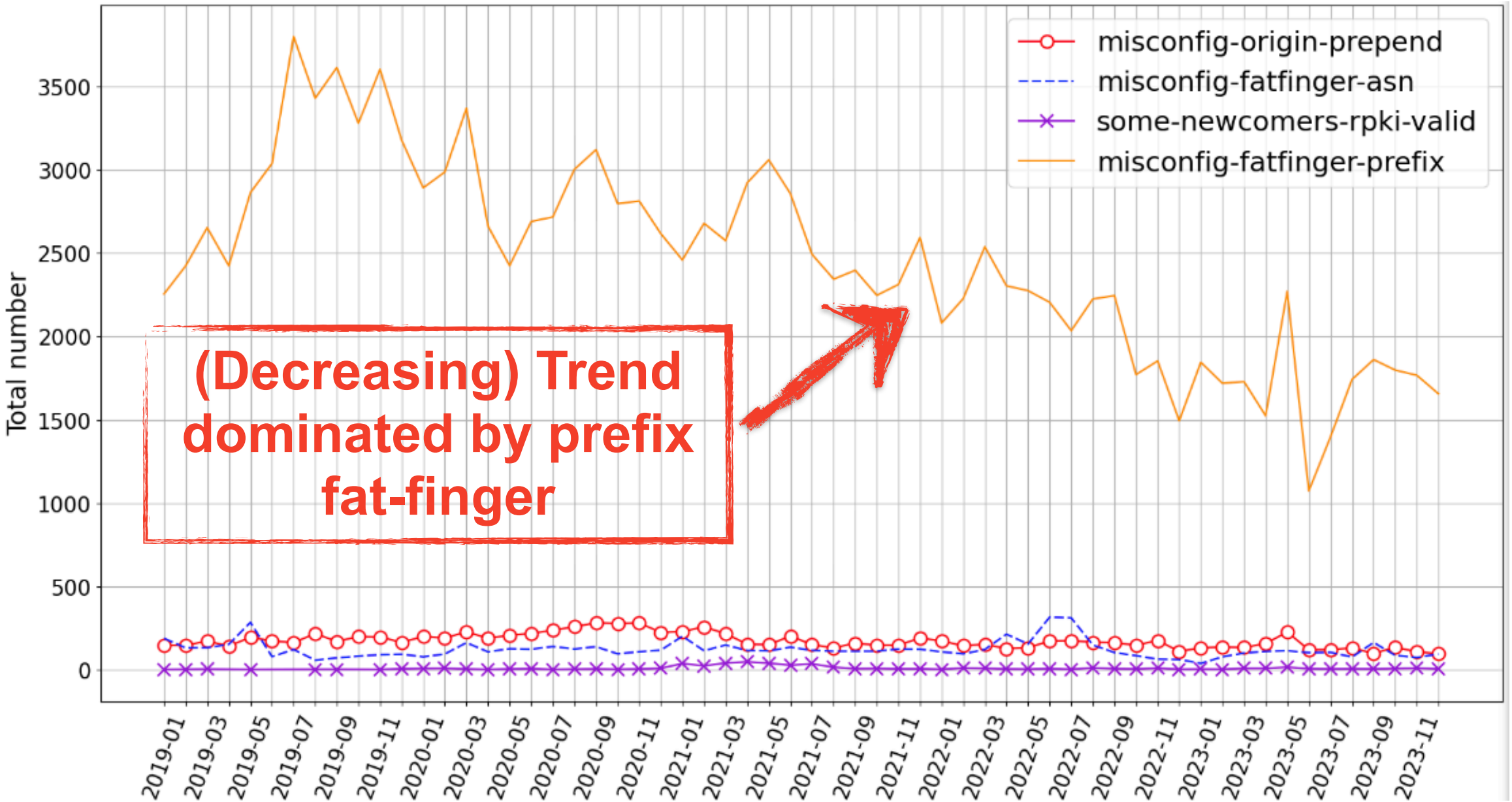
A closer look at misconfigurations



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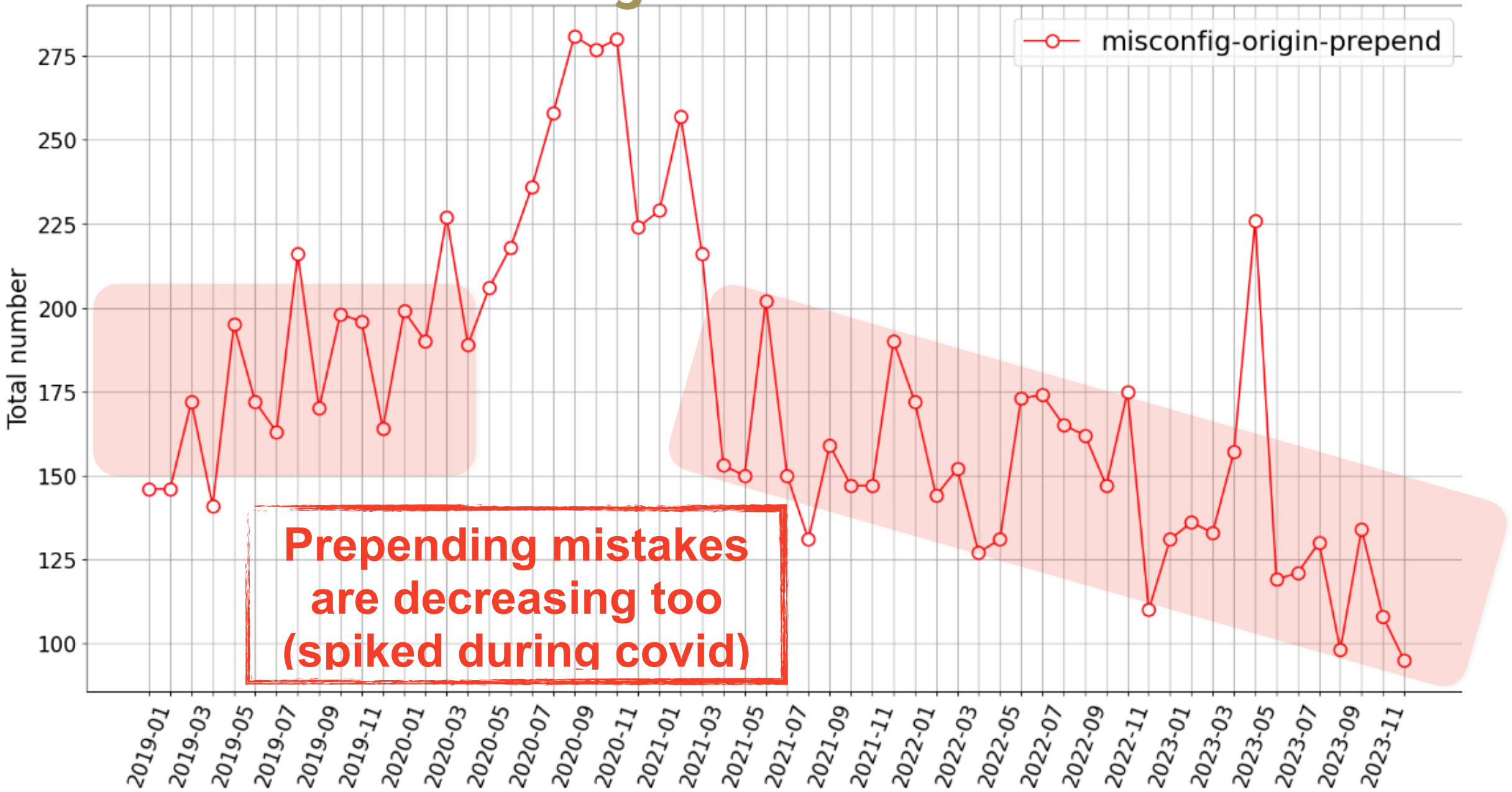

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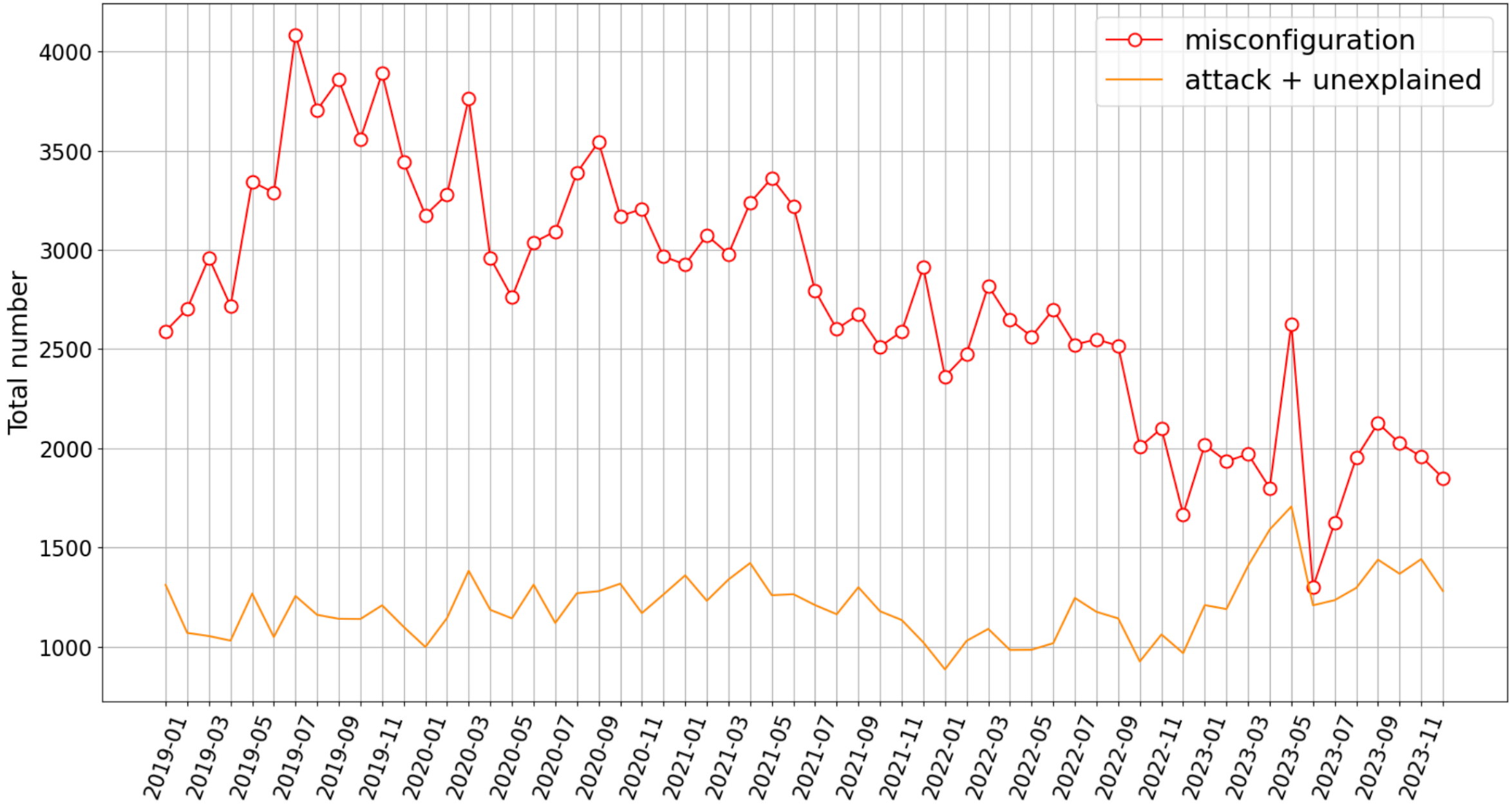

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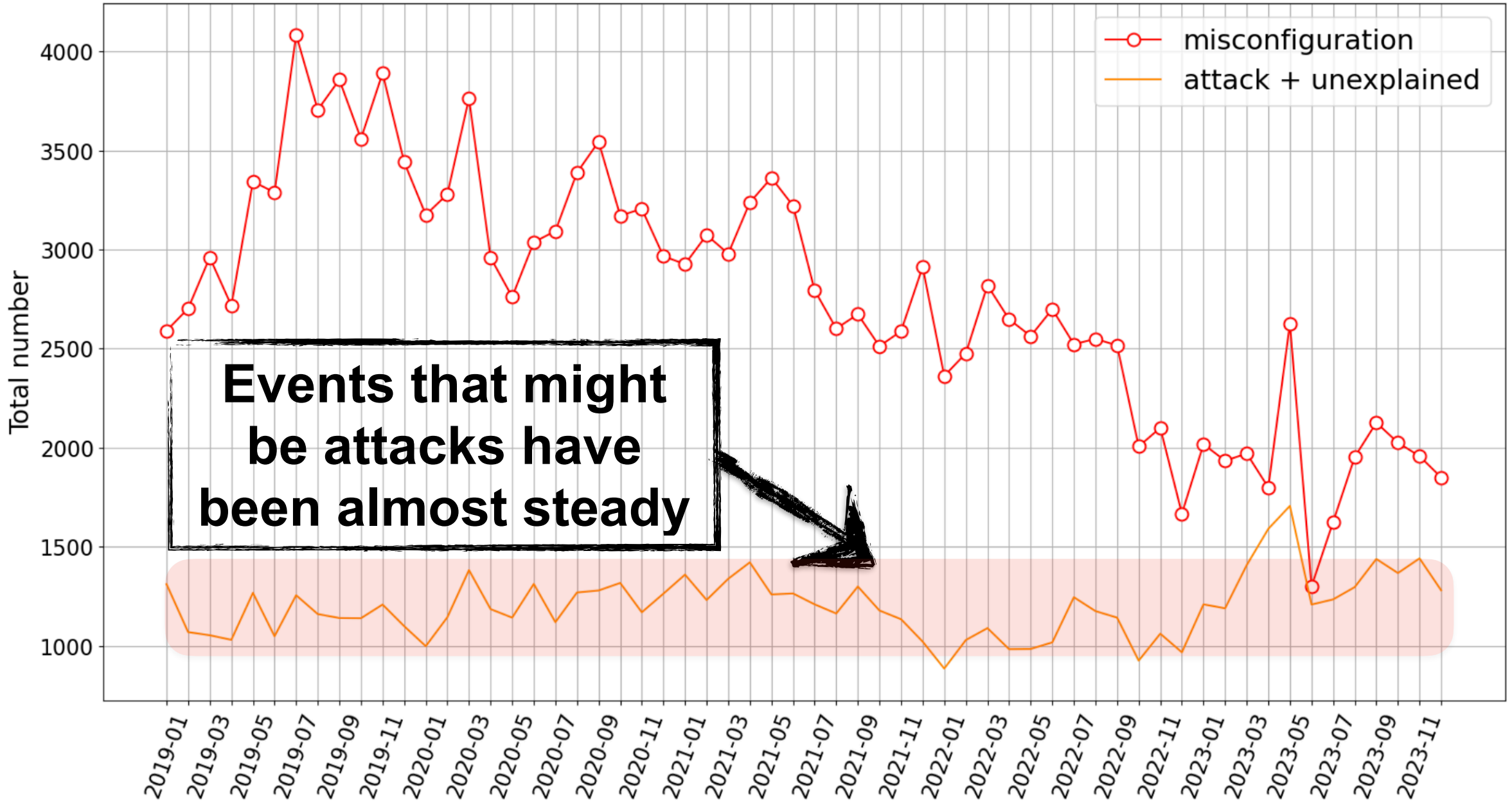

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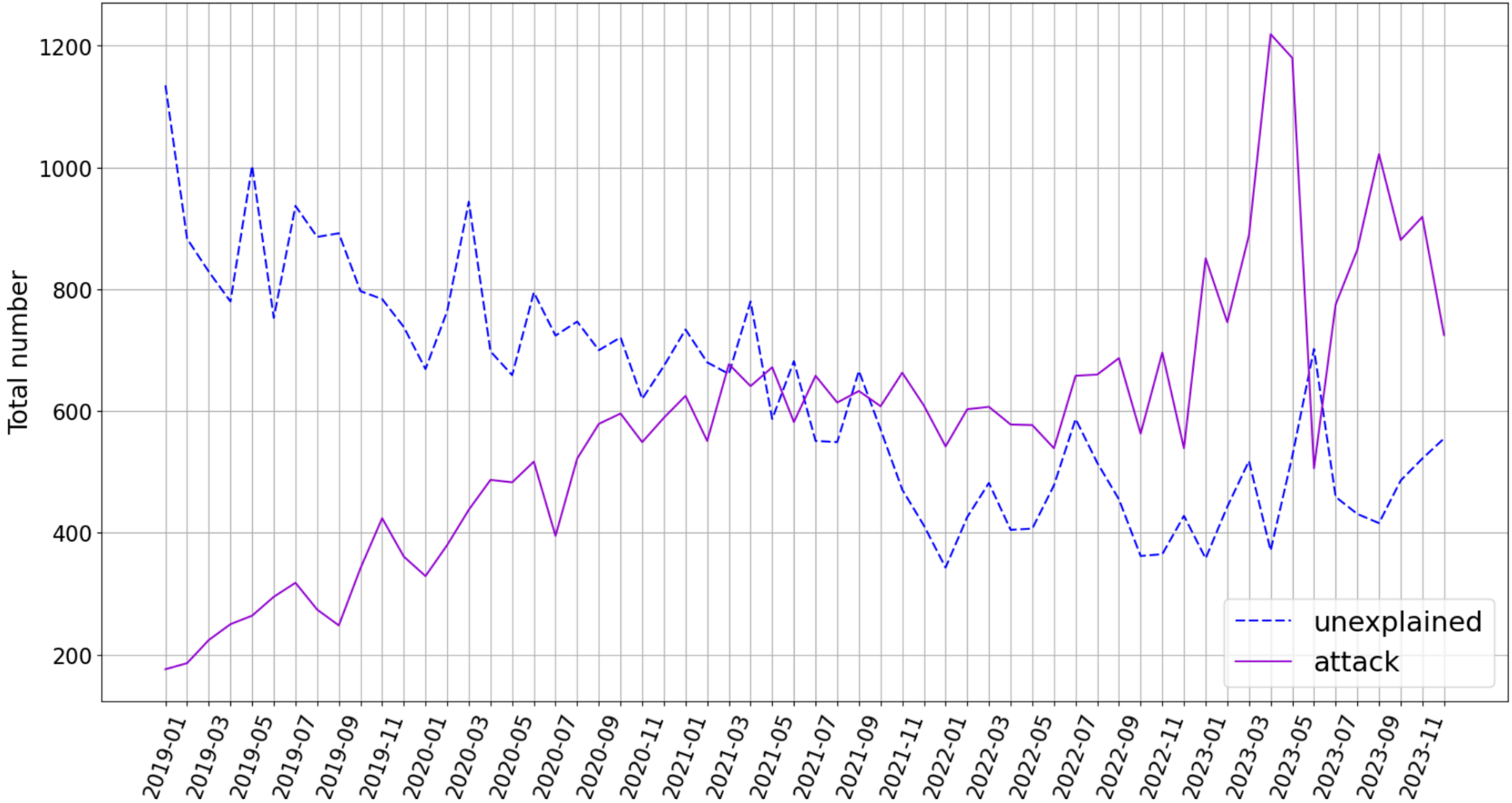
More “explainable” events



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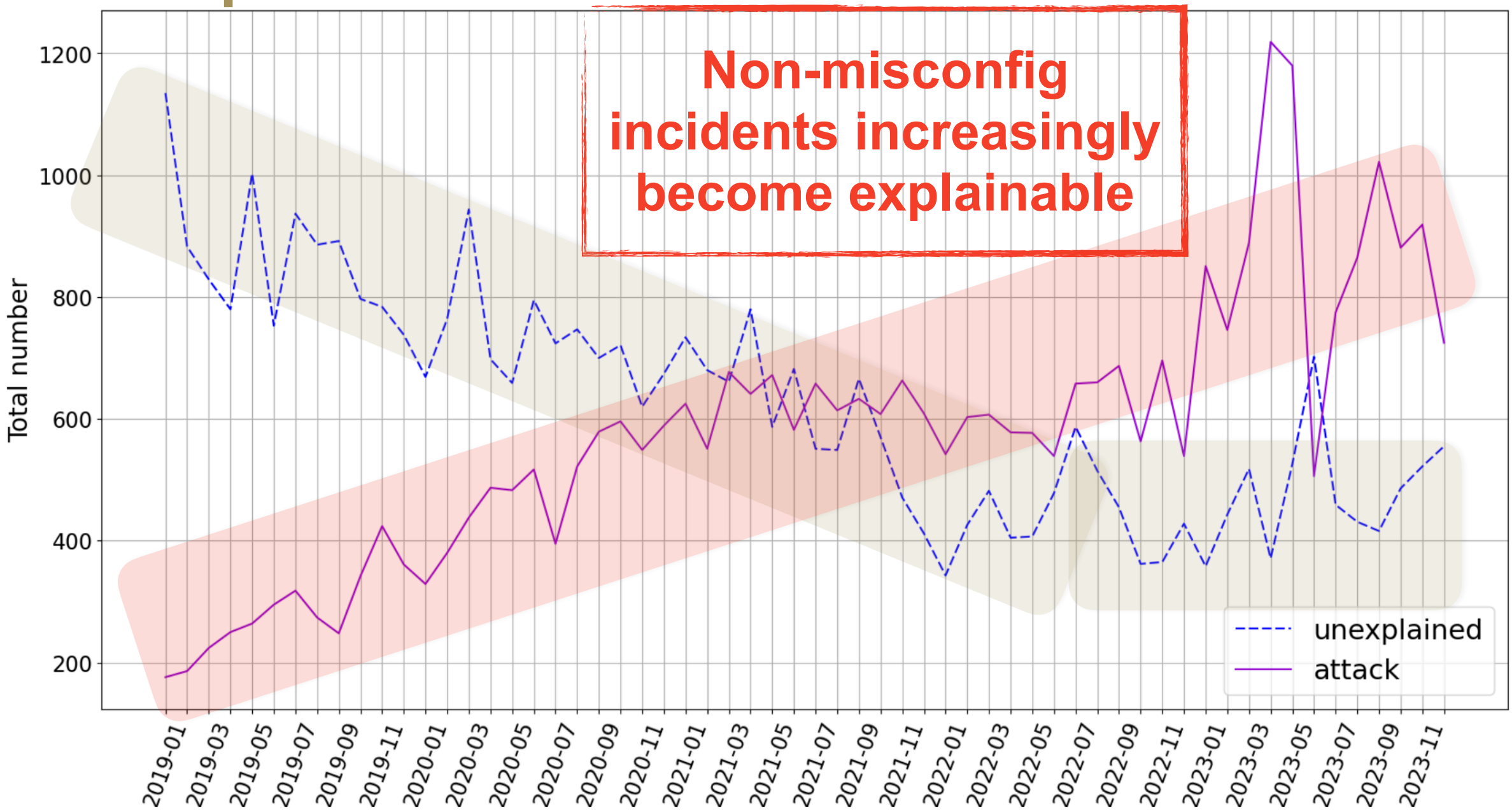

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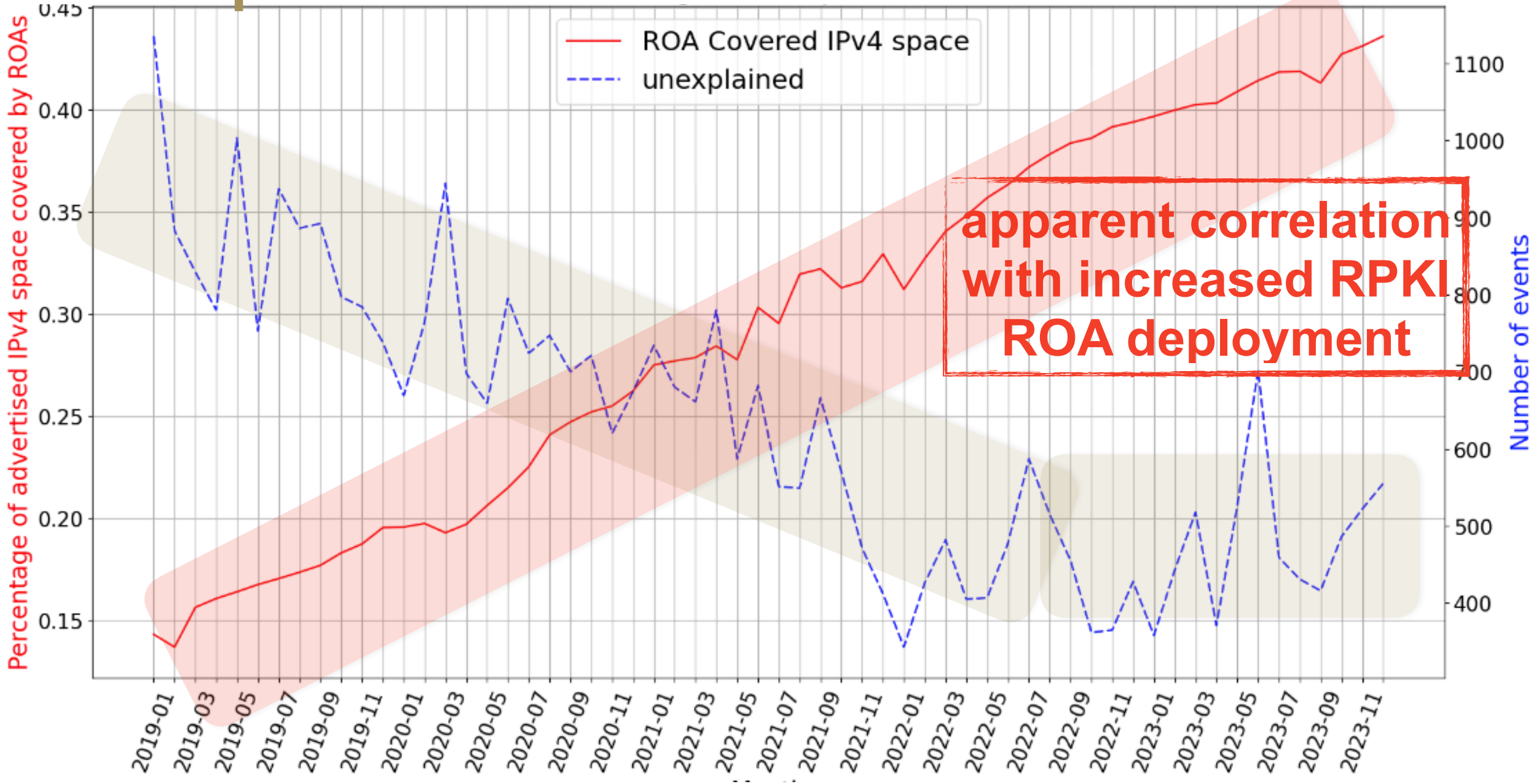

apparent correlation with increased RPKI ROA deployment

>> preliminary results <<

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Thank you!

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