ShakeAlert: *Detecting Waves in the Internet Control Plane*

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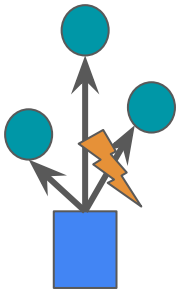
Sometimes there are failures

Challenges of a big network:

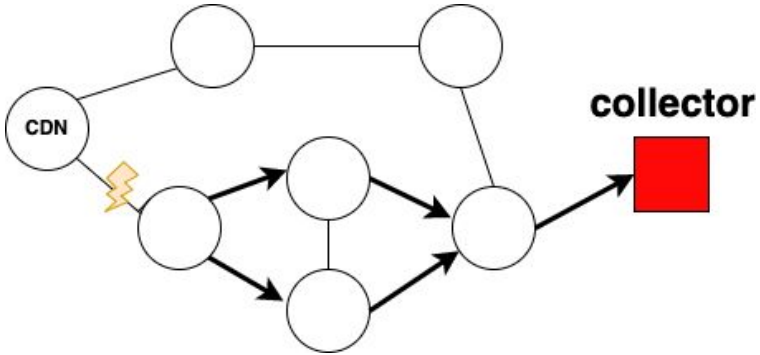
- Many routers, many failures.
- Many providers, many failures.

An external source could be powerful addition!



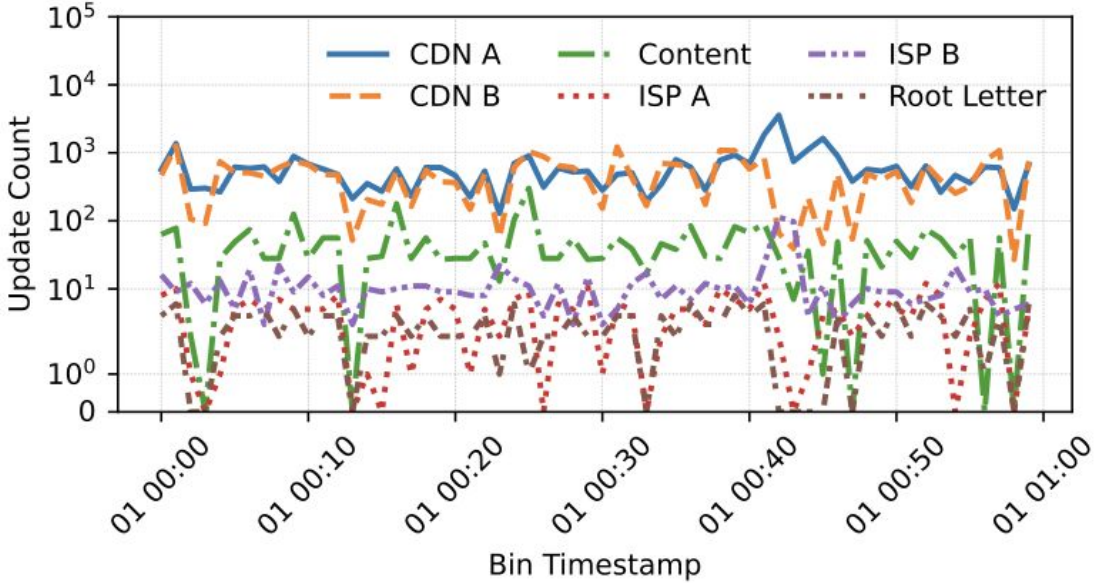
Using RIS Live

- Look at updates with paths with our network as origin
  - These will reflect changes in path towards us.



Steady State Update Volumes

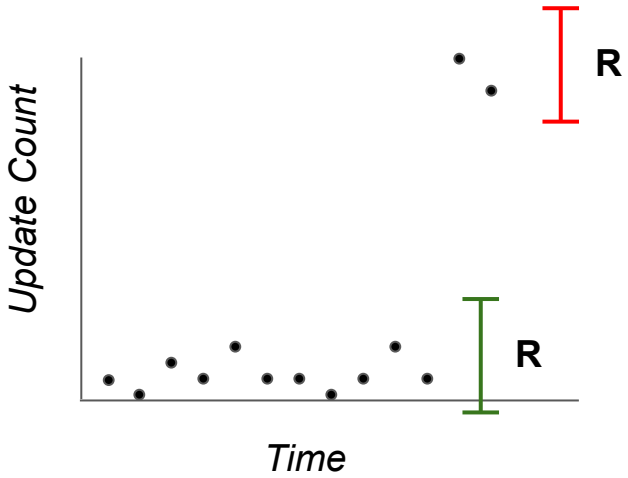
- Count the ***number*** of updates seen each minute.
- Different networks have different steady-state patterns.



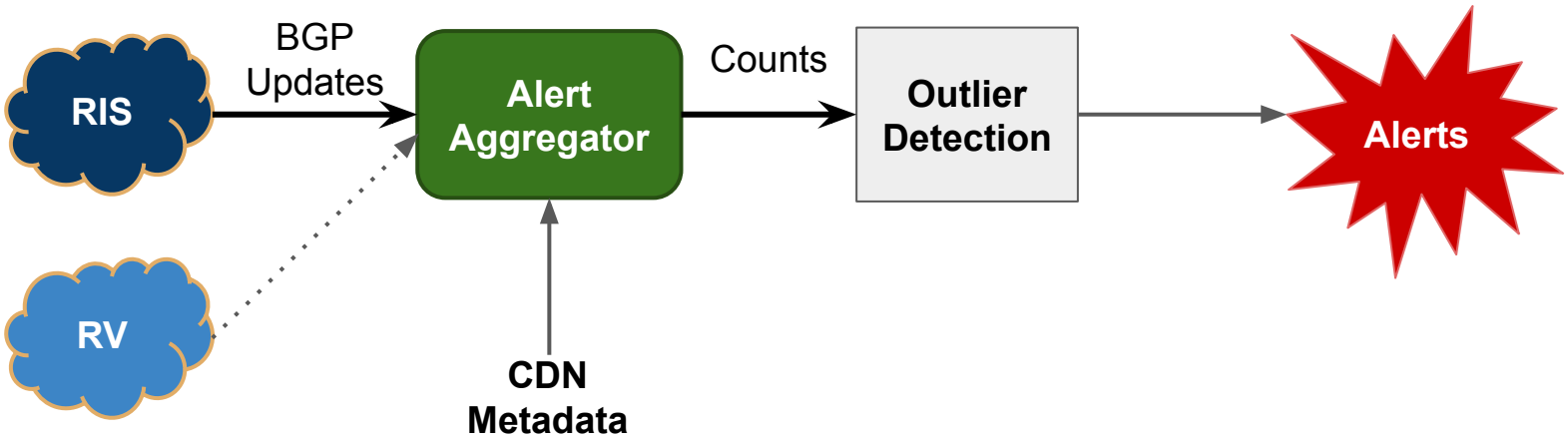
But when event happens, the count often increases dramatically!

Outlier Detection

- Look for outliers
  - Use a density based detection algorithm
  - Require *k* neighbors within radius *R* within time window *w*
- If a new bucket violates the criteria, it alerts as a *Shake*

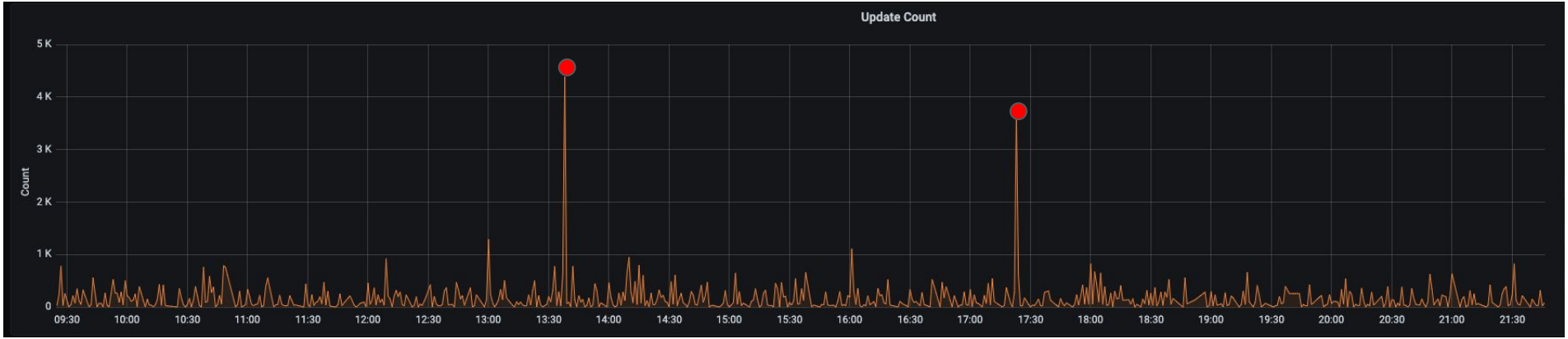


ShakeAlert System



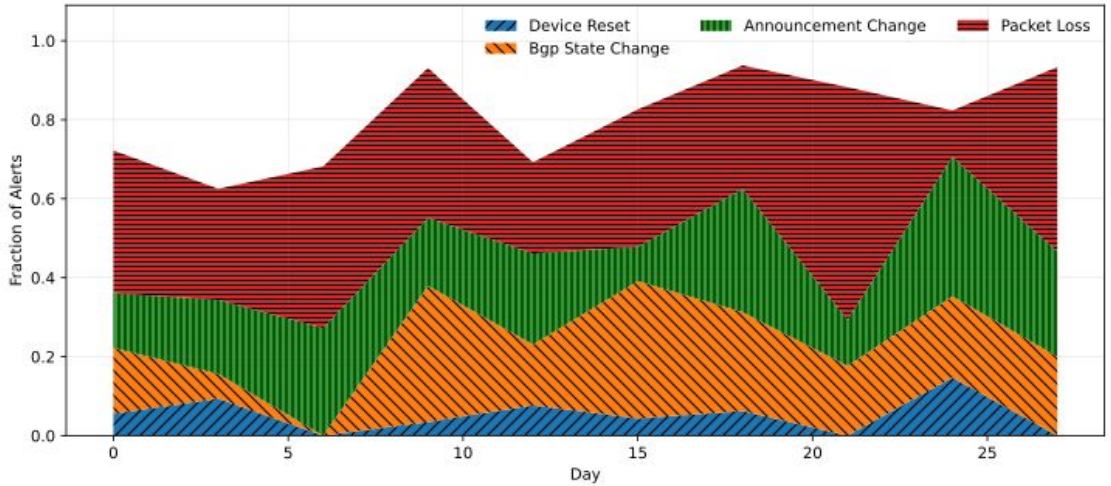
Likely-impact-localization

- CDN Meta Data enables to understand impacted sites
- Avoid performing *fault* localization



What does it actually mean for the CDN?

- Are there measurable impacts to the CDN?
  - Don’t expect every Shake to have a measurable impact
  - With tuned parameters, we found that the majority of shakes correlate with significant events!



Conclusion

- ShakeAlert provides an entirely external alert system that can provide extra visibility to operators.
  - Provides a view independent from active monitoring and heartbeat systems.
- Can monitor yourselves, but also other networks as well!