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Automation of Event Correlation and Clustering With Built-In Machine Learning Algorithms in Splunk IT Service Intelligence (ITSI)

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You Need an Approach That…

Provides easy and seamless access to all data of any type and volume

1 Delivers **service context** to prioritize investigation

2 Understands **time-based behavior** based on historical patterns

3 **Helps you find what's broken quickly** with human-scale actionable alerts

The Three Pillars of Monitoring Data

ITSI needs to be able to handle all of this in order to be “The Backbone of IT Monitoring”

Logs

Metrics

Events

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Logs

Metrics

Events

What the Heck is an (IT) Event Anyway?

- For the purposes of this talk when we say “Event” we are referring to Events in the IT sense not the Splunk sense.
- Self descriptive message that tells a user that something happened.
- Usually contain some sort of title, severity, and description.
- Used to determine in the moment health.
- Often very noisey.
- Think alarm data coming out of tools like Nagios, Solarwinds, APM, Netcool, etc.

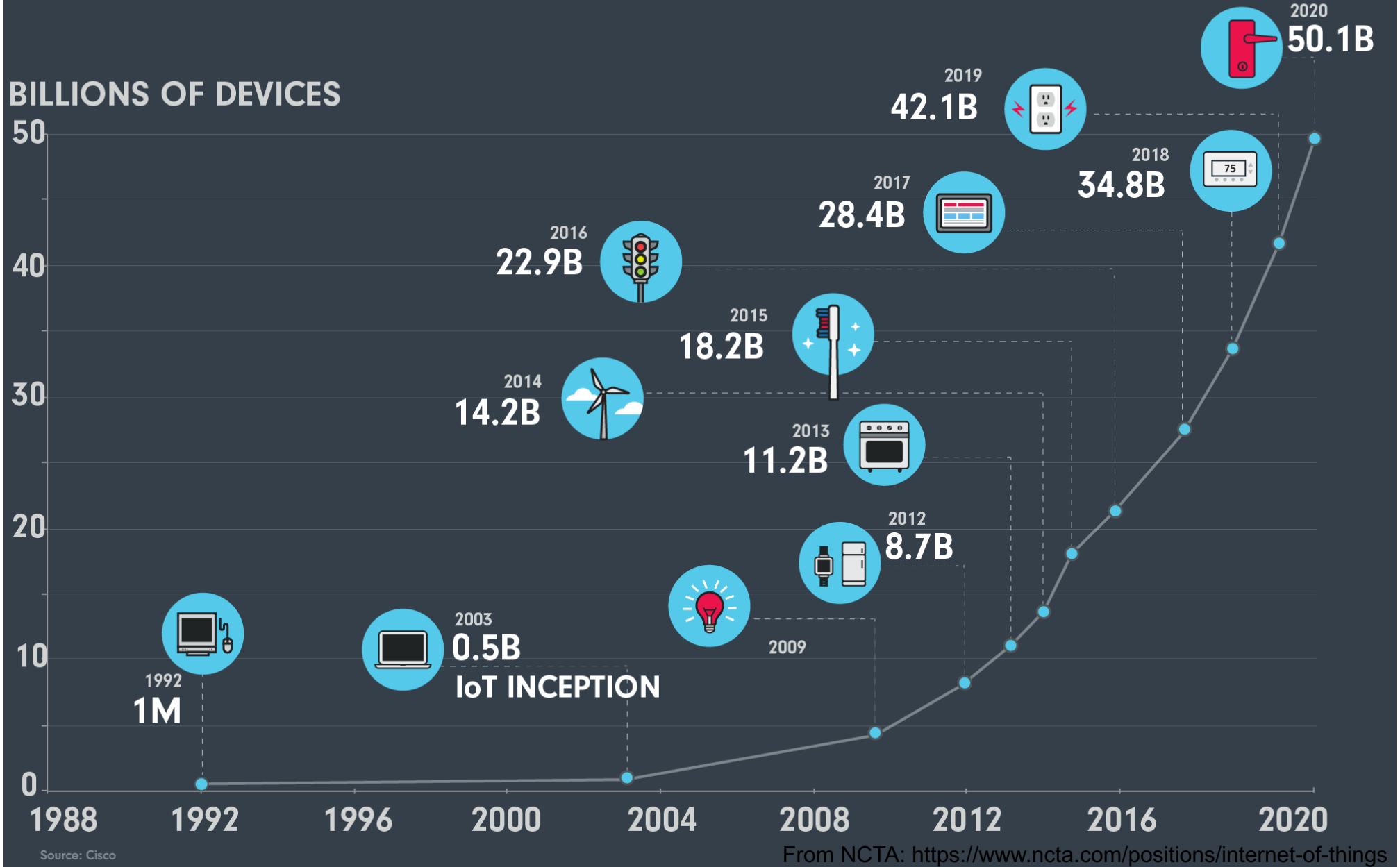
Example Event

Nagios Health Check

1502642822 src_host="splunk_sh-01" omd_site ="SJC" perfdata="SERVICEPERFDATA" name="check_dhcp" severity="OK" attempt="1" statetype="HARD" executiontime="0.000" latency="0.000" reason="OK: Received 1 DHCPOFFER(s), max lease time = 600 sec." result="OK"

GROWTH IN THE INTERNET OF THINGS

THE NUMBER OF CONNECTED DEVICES WILL EXCEED **50 BILLION** BY 2020



From NCTA: https://www.ncta.com/positions/internet-of-things

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The Road to ITSI Event Analytics

ITSI 2.1

ITSI supports Notable Events.

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ITSI releases the Policy Engine. Users can curate policies that reduce the noise in events and take automated action.

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ITSI releases Smart Mode. ITSI can now use machine learning to reduce noise in events.

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Splunk ITSI for Event Analytics

Simplify Your Operations With Artificial Intelligence and Service Context

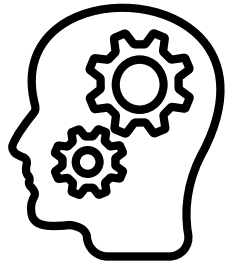
Service Context

Find and fix the most important issues

Contextualize and prioritize

Reduce time-to-resolution on business-critical services

Artificial Intelligence



Transform IT operations with machine learning

Separate valuable signal in noise

Enable IT with intelligence for **data-driven decisions**

Scalable Platform

Get a full view of your IT environment

Respond collaboratively and simplify operations

Share customized insights across the enterprise to enable **business-centric IT**

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Under the hood

Vineetha Bettaiah

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Objective

To identify all ideal groups of similar events

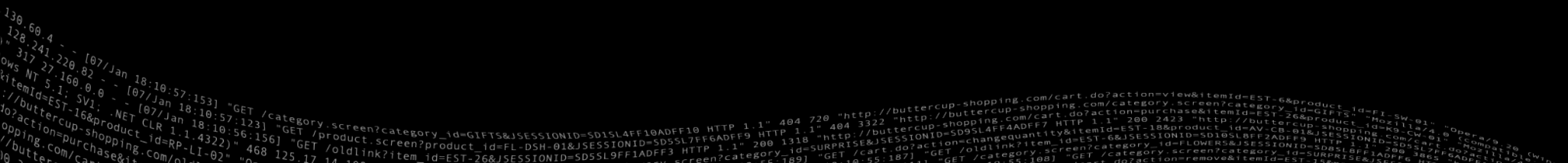
- Input – Set of events
- Features – Each event has a number of attribute fields (topological, numerical, text, etc)
- Output – List of ideal groups with characteristic metadata of each group

Group 1 Metadata

name = "check_dhcp
severity = “OK”
reason = “OK: Received 1 DHCPOFFER(s)

Group 2 Metadata

src_host="splunk_sh-01
statetype="HARD"



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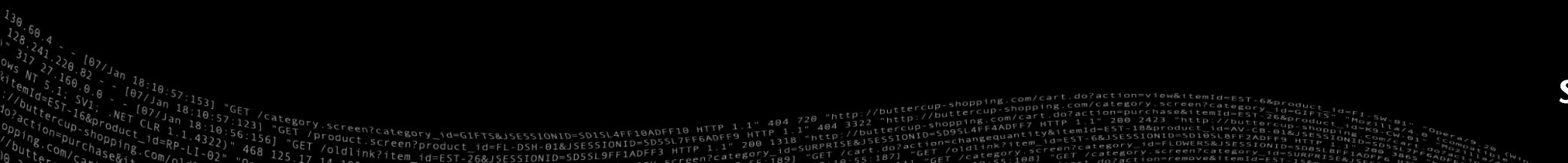
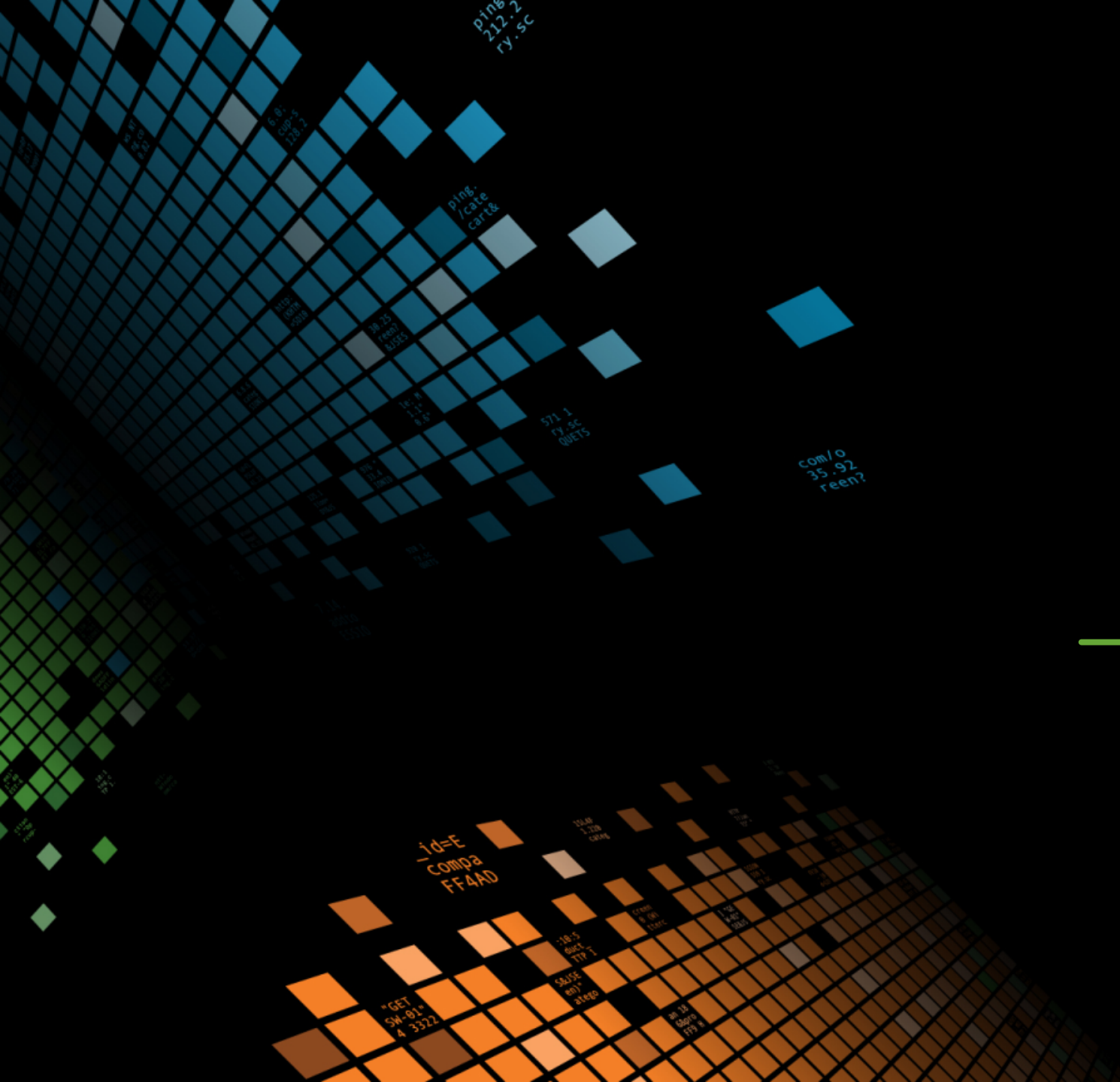
This is not easy

Big O is not your friend

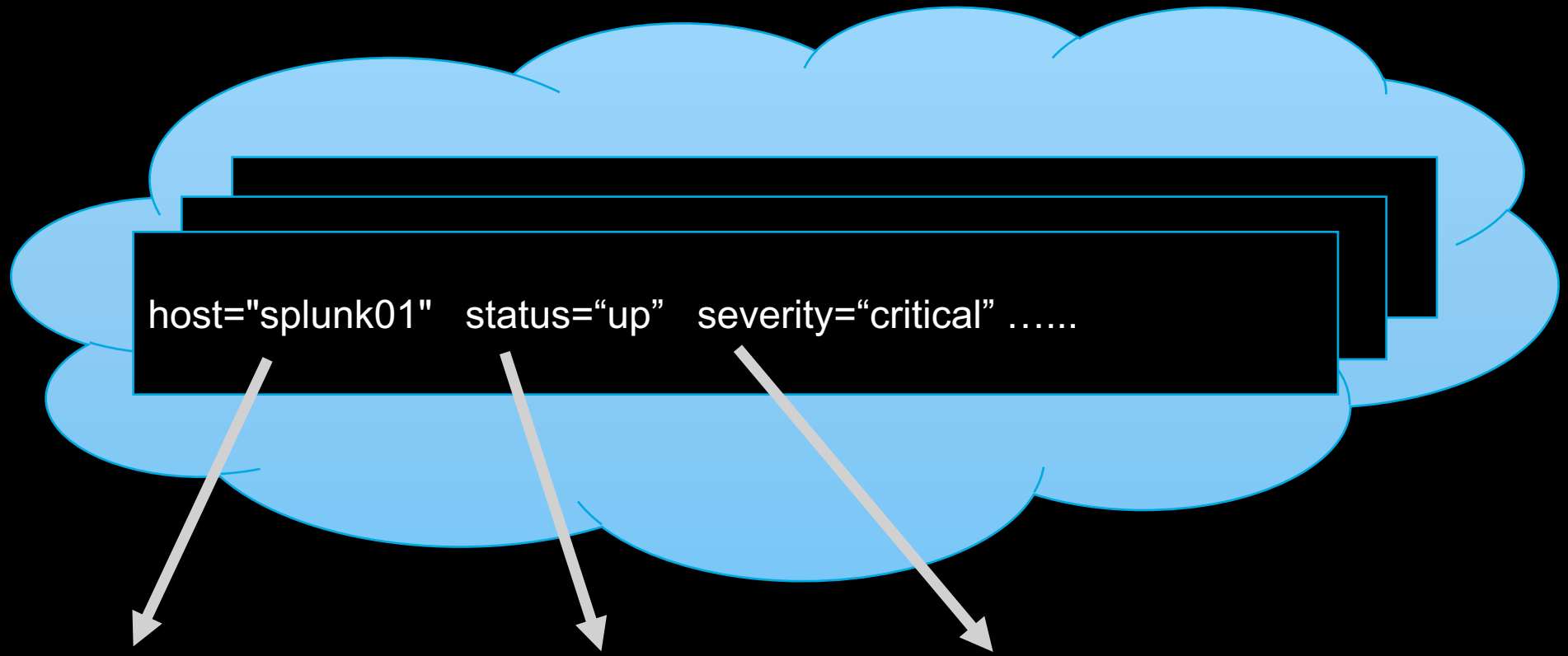
- The computational complexity is exponential
  - Number of event feature fields = 78
  - Number of possible feature values = 4
  - Number of possible groupings = 2^{80}
- An event can belong to many groups
- Brute force is not a practical approach for real time data





Approach and Algorithm

Step 1- Feature Extraction



Step 2 – Reverse Pyramid Clustering

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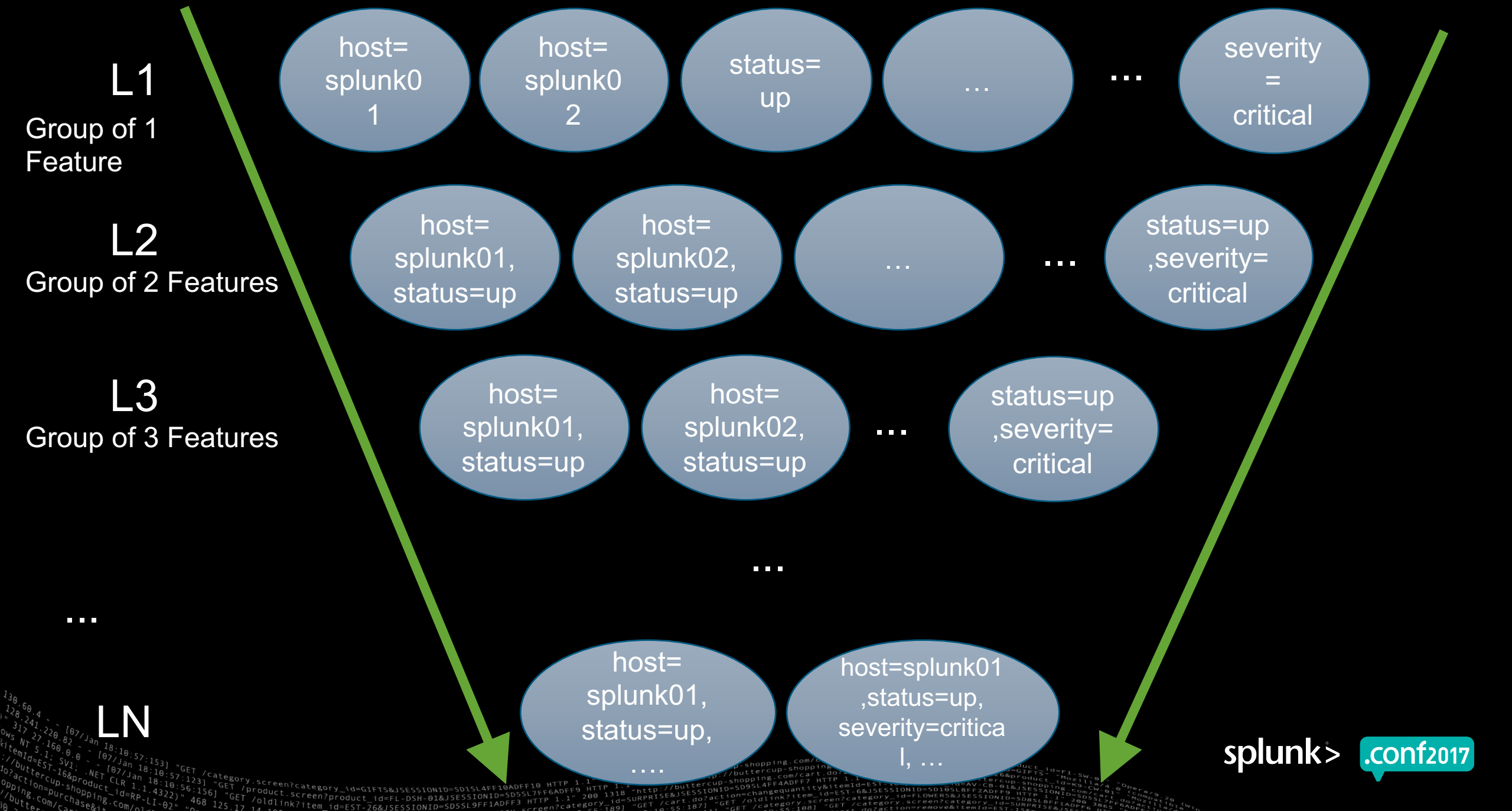

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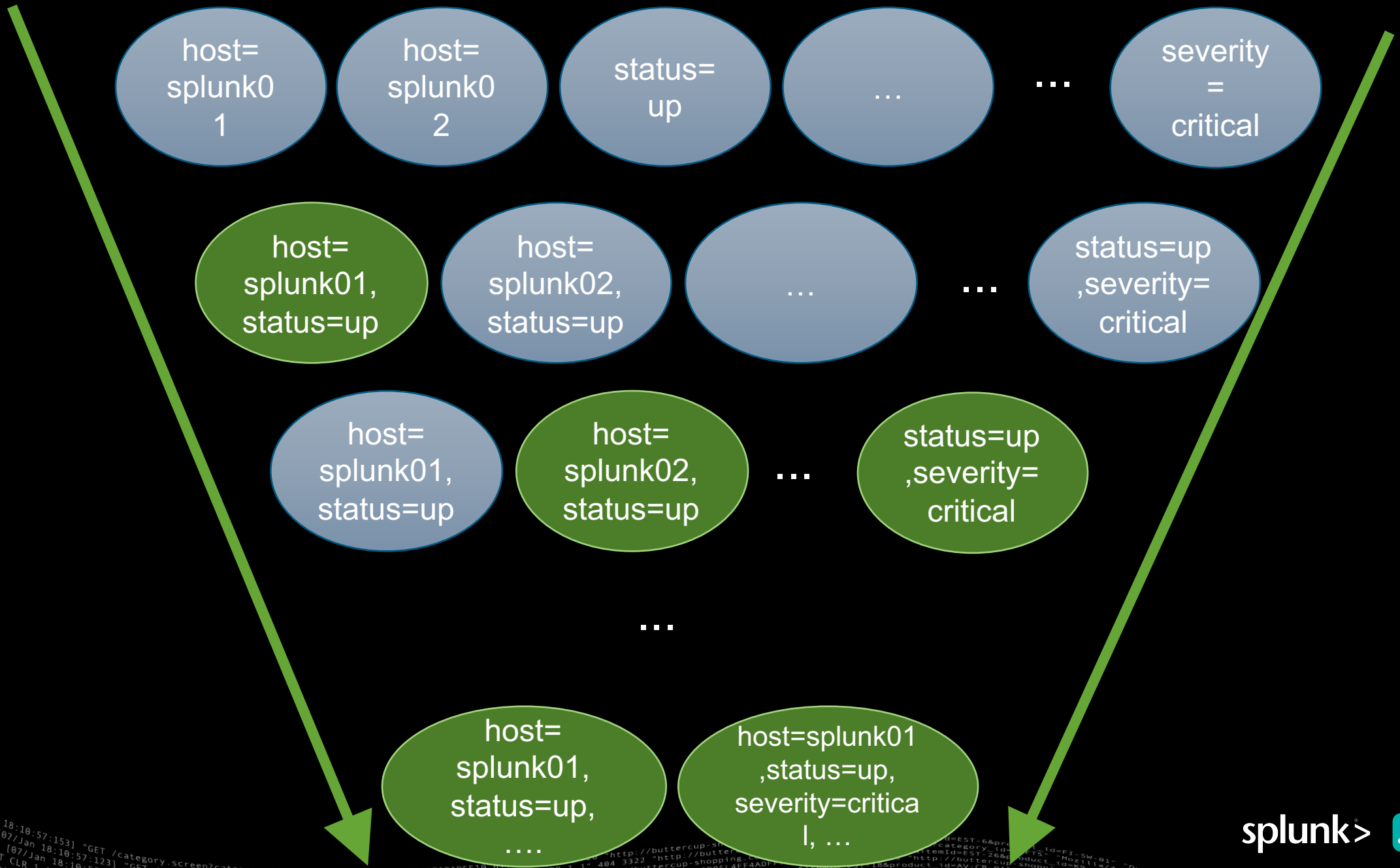
Step 3 – Backtracking



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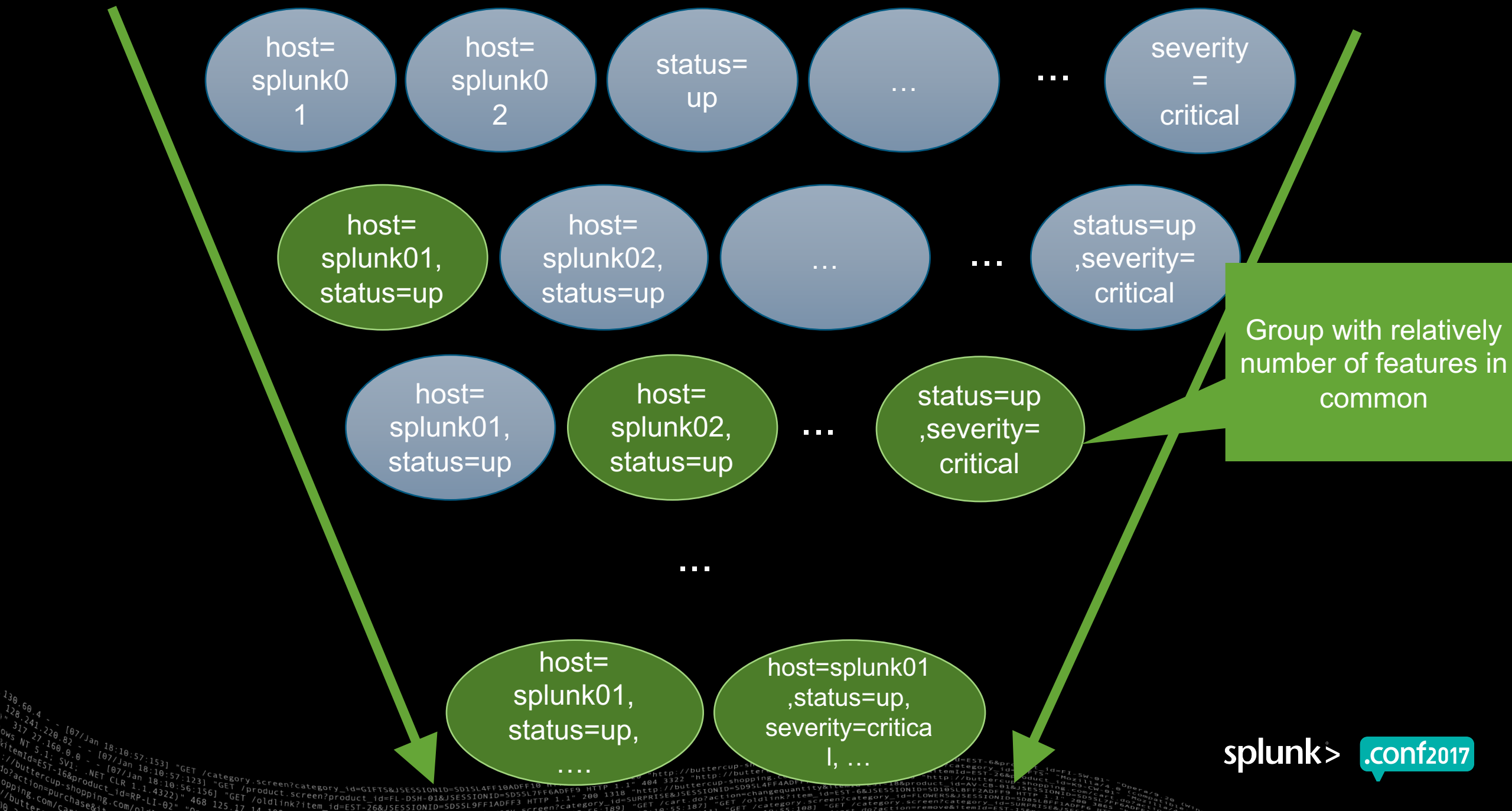

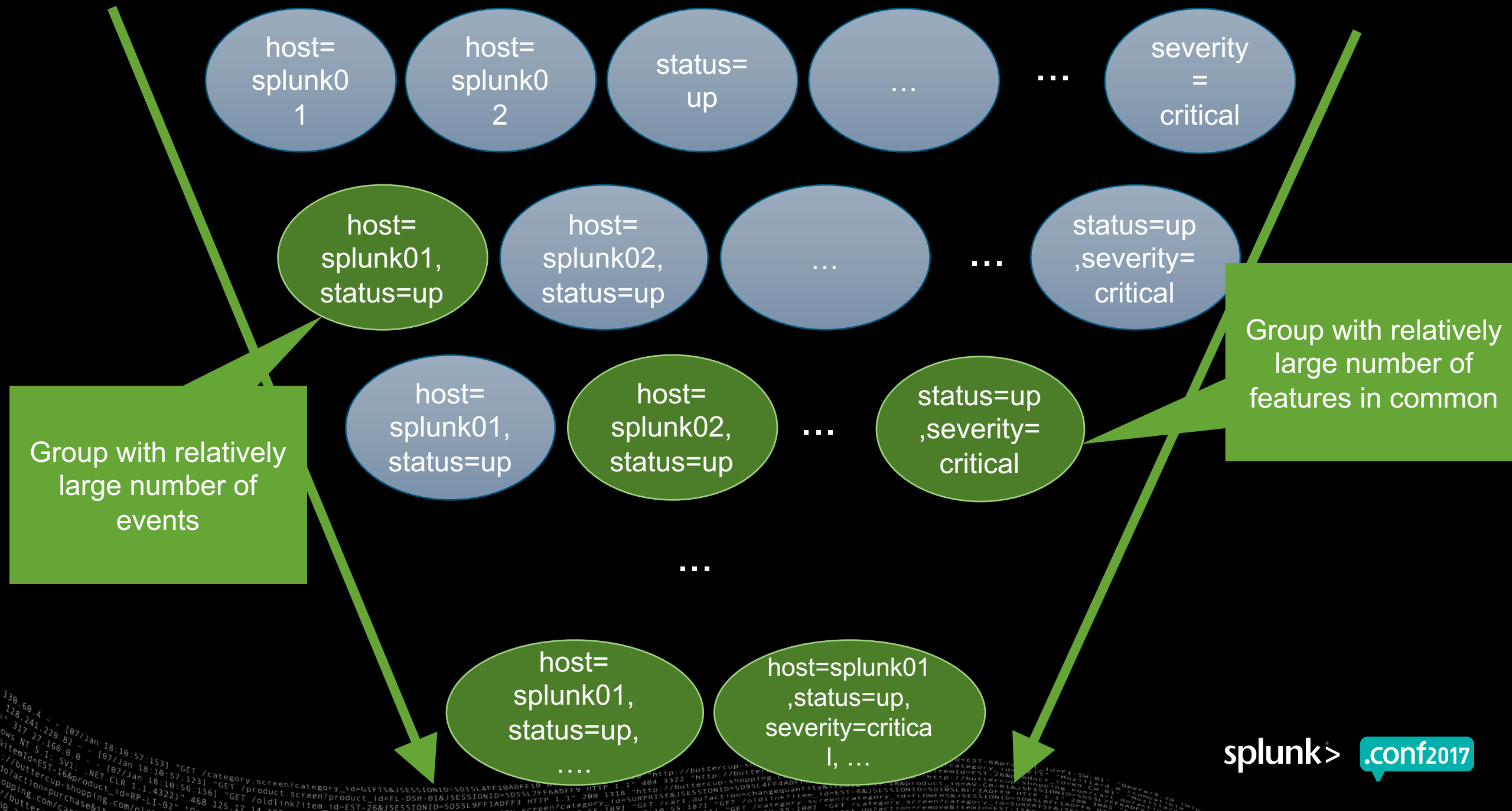

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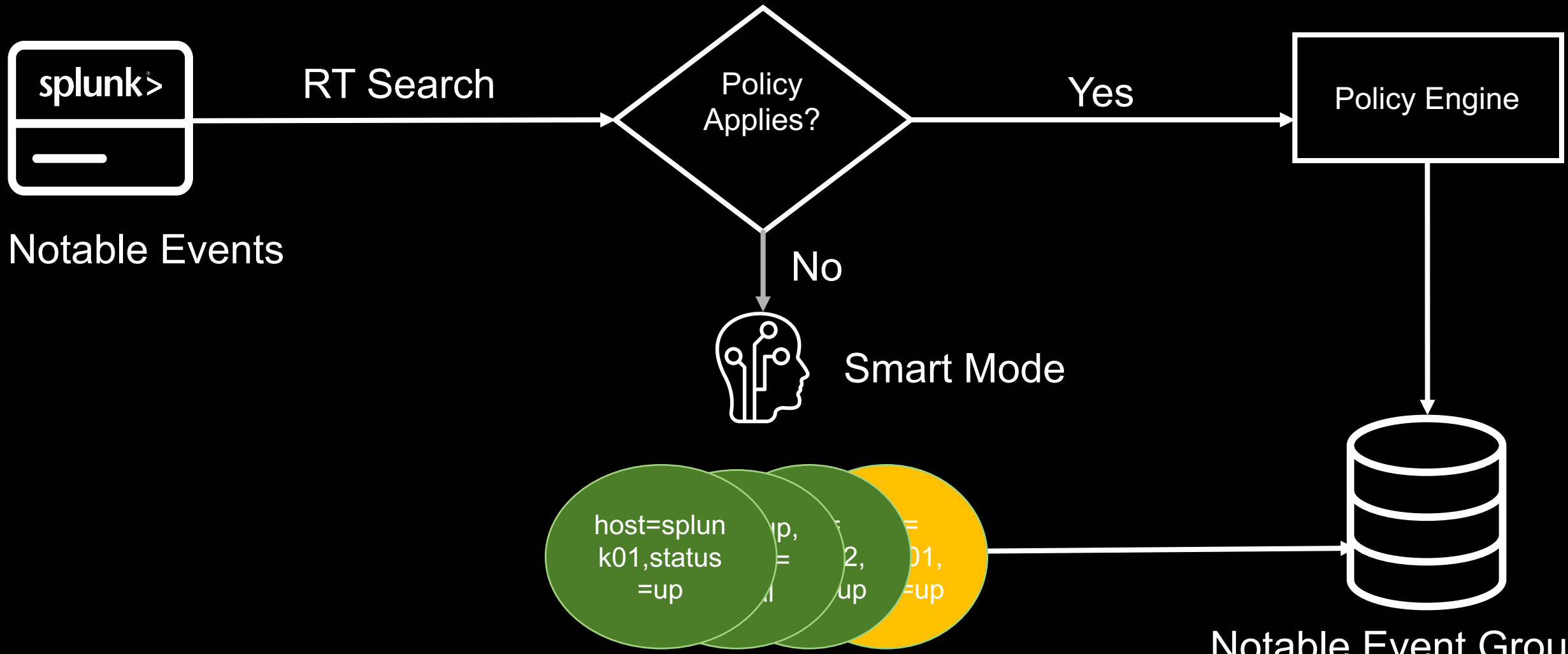
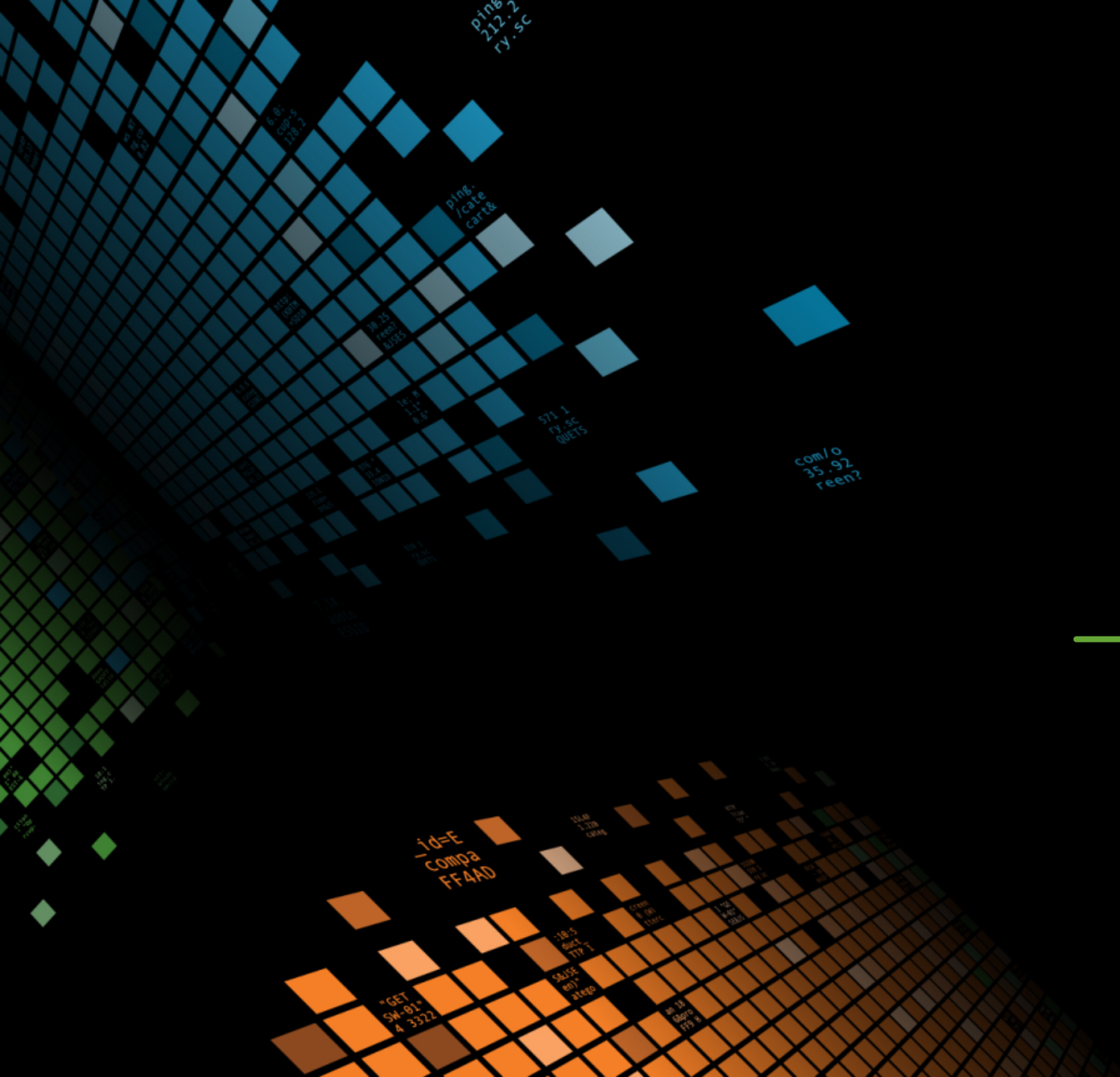
Let's run in real time!





Splunk Demo

Presented by Buttercup Splunker

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The principles behind a successful ML feature

This is where the subtitle goes

Explainability

The feature should be able to clearly explain to the analyst any inferences made.

Configurability

The feature should be easy to configure and tune by users of different technical abilities.

Extensibility

The feature should be extensible so that it can be quickly iterated upon.

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The ITSI way

This is where the subtitle goes

Explainability

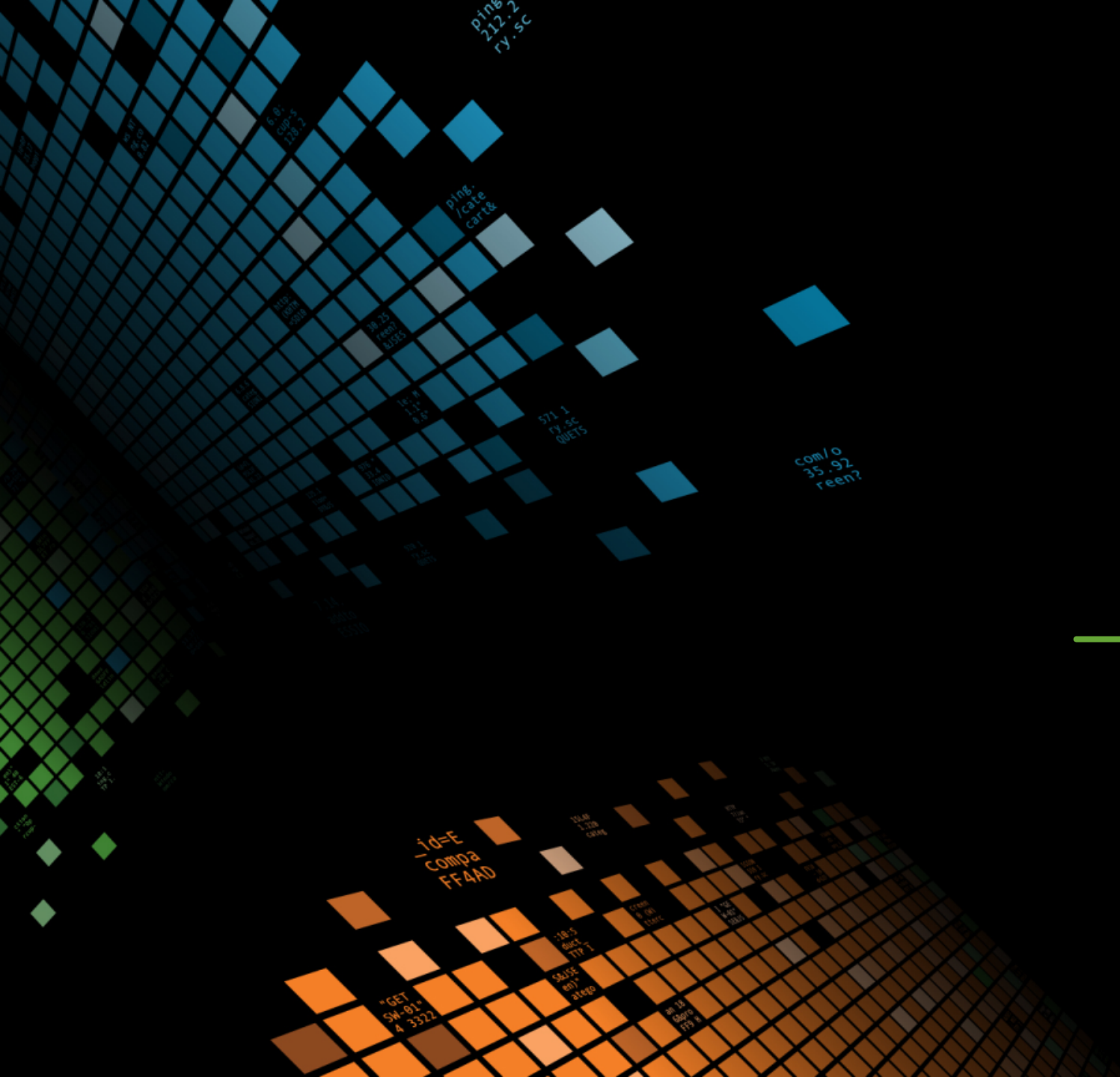
Every group that is discovered includes a human readable explanation of how it came to be.

Configurability

ITSI provides a UI that lets non-Data Scientists tune the algorithm's parameters.

Extensibility

Smart Mode is built on top of a Machine Learning Engine, on which additional "Factors" will be added over time.



Q&A

Participant name | Role

Participant name | Role

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