Case Study

Log Manager

Role: **Design**
Lifecycle: **New product**

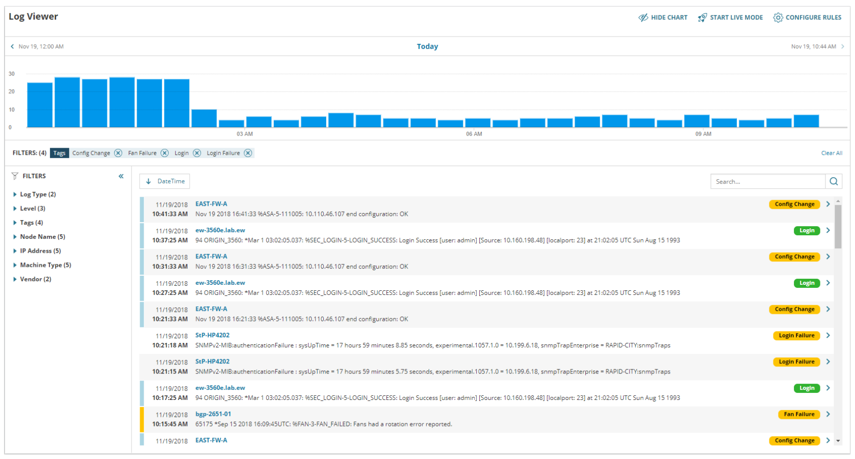
SolarWinds Log Manager is a research tool for machine-generated messages. IT administrators are responsible for maintaining servers, applications, cloud services, telephones,PCs, and network devices. All of these things generate short text messages confirming their health, reporting task completion, and occasionally reporting errors or failures. We believed there was an opportunity for a new product to help users make sense of this flood of information.

The Problems

Strong Competitors - IT log management is a very crowded space. We had to contend with Splunk (a $14B goliath), dozens of SaaS offerings, and ELK (a popular open-source solution). Platform vendors, like VMware, Red Hat, and Amazon have released their own log products with strong ties to their ecosystem.

Legacy Limitations - A traditional log research product would be based on an inverted-index store of some sort, like Lucene or Elastic. However, following a recent debacle with another product, we could not introduce new software requirements for a product on our platform. That meant we had to make do with Microsoft SQL Server.

Our Responses



```
11/19/2018  EAST-FW-A                                                                                   Config Change
10:41:33 AM Nov 19 2018 16:41:33 %ASA-5-111005: 10.110.46.107 end configuration: OK
11/19/2018  ew-3560e.lab.ew                                                                             Login
10:37:25 AM 94 ORIGIN_3560: *Mar 1 03:02:05.037: %SEC_LOGIN-5-LOGIN_SUCCESS: Login Success [user: admin] [Source: 10.160.198.48] [localport: 23] at 21:02:05 UTC Sun Aug 15 1993
11/19/2018  EAST-FW-A                                                                                   Config Change
10:31:33 AM Nov 19 2018 16:31:33 %ASA-5-111005: 10.110.46.107 end configuration: OK
11/19/2018  ew-3560e.lab.ew                                                                             Login
10:27:25 AM 94 ORIGIN_3560: *Mar 1 03:02:05.037: %SEC_LOGIN-5-LOGIN_SUCCESS: Login Success [user: admin] [Source: 10.160.198.48] [localport: 23] at 21:02:05 UTC Sun Aug 15 1993
11/19/2018  EAST-FW-A                                                                                   Config Change
10:21:33 AM Nov 19 2018 16:21:33 %ASA-5-111005: 10.110.46.107 end configuration: OK
11/19/2018  StP-HP4202                                                                                  Login Failure
10:21:18 AM SNMPv2-MIB:authenticationFailure : sysUpTime = 17 hours 59 minutes 8.85 seconds, experimental.1057.1.0 = 10.199.6.18, snmpTrapEnterprise = RAPID-CITY:snmpTraps
11/19/2018  StP-HP4202                                                                                  Login Failure
10:21:15 AM SNMPv2-MIB:authenticationFailure : sysUpTime = 17 hours 59 minutes 5.75 seconds, experimental.1057.1.0 = 10.199.6.18, snmpTrapEnterprise = RAPID-CITY:snmpTraps
11/19/2018  ew-3560e.lab.ew                                                                             Login
10:17:25 AM 94 ORIGIN_3560: *Mar 1 03:02:05.037: %SEC_LOGIN-5-LOGIN_SUCCESS: Login Success [user: admin] [Source: 10.160.198.48] [localport: 23] at 21:02:05 UTC Sun Aug 15 1993
11/19/2018  bgp-2651-01                                                                                 Fan Failure
10:15:45 AM 65175 *Sep 15 2018 16:09:45UTC: %FAN-3-FAN_FAILED: Fans had a rotation error reported.
11/19/2018  EAST-FW-A                                                                                   Config Change
```

The Log Manager research screen

Target the End User

Before we started design, we ran several weeks of interviews with our existing customers. We wanted to learn how they used log data, how they stored it, and what products they used for research.

Not surprisingly, many of them used competitors like Splunk or ELK. However, we usually found that these systems were complex and brittle. They often required a dedicated team, extensive vendor support, and draconian change management protections.

Many customers had considered using a SaaS solution, but were concerned about sending business-critical diagnostic data outside their network. Ultimately, they wanted to own and manage their log data, not send it off to another team and certainly not to another company.

I designed Log Manager to look and feel like another element of our on-premise product suite. I presented log management as a natural extension of monitoring, not a stand-alone function.

Focus on Inbound Processing

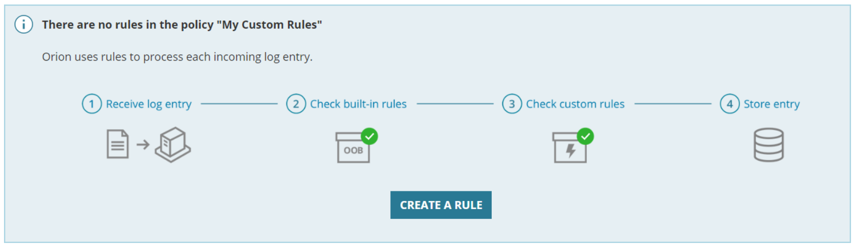
For the research task, most of our competitors lean heavily on a search bar with some sort of domain-specific query language. Splunk has a sprawling search language with dozens of complex, esoteric commands. Even modest log management offerings include powerful tools for searching both text and complex data structures.

We were bound to a traditional, relational database with limited support for text search and poor support for storing and querying rich data structures. We could try to match our competitors on features, but they would crush us on query speed.

Instead, I proposed a tagging system to front-load common queries. When a log message was received, we would analyze and classify it. We could use our extensive IT domain knowledge to add insightful tags to entries. Users could also create their own classification rules to capture their unique business rules.

This rule-first approach has had the side-effect of driving cross-sell. Individual product teams have created "rule packs" that encode logic specific to the vendors and technologies they support. This allows each team to add compelling feature lines to their release while making Log Manager smarter.

Outcome


There are no rules in the policy "My Custom Rules"

Orion uses rules to process each incoming log entry.

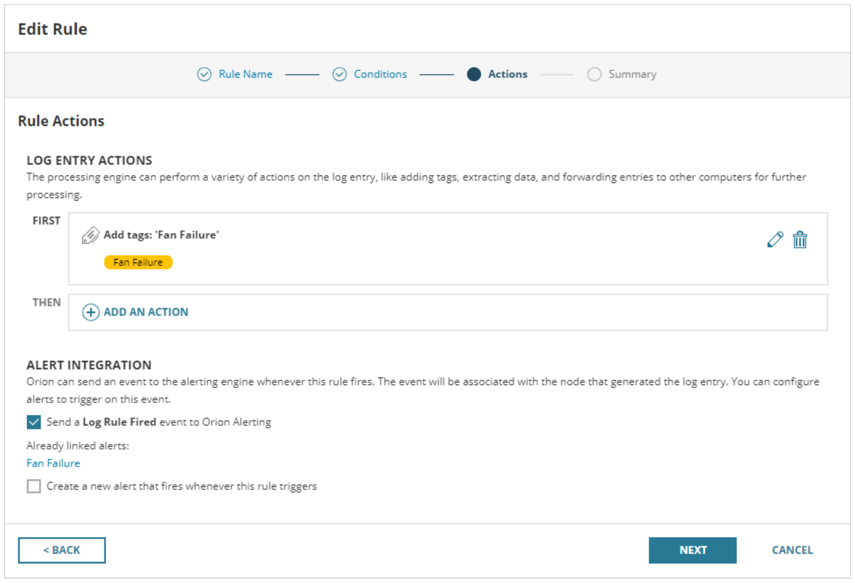
Guidance for populating a custom policy

Log Manager has performed well with our existing customers. We've released our first "rule pack, " with two more in development right now. In post-release customer interviews, users have confirmed that the product represents "just enough" log management.

However, the compromises we made to hit that segment have limited the reach of the product. The extensive ties to the SolarWinds on-premise platform make Log Manager a weak stand-alone tool. The lack of robust search weakens our troubleshooting story.

Despite these limitations, the product seems positioned to be a solid revenue stream in the coming years.

One Detail


Edit Rule

Rule Name — Conditions — Actions — Summary

Rule Actions

LOG ENTRY ACTIONS
The processing engine can perform a variety of actions on the log entry, like adding tags, extracting data, and forwarding entries to other computers for further processing.

FIRST
Add tags: 'Fan Failure'
Fan Failure

THEN
ADD AN ACTION

ALERT INTEGRATION
Orion can send an event to the alerting engine whenever this rule fires. The event will be associated with the node that generated the log entry. You can configure alerts to trigger on this event.

[✓] Send a **Log Rule Fired** event to Orion Alerting

Already linked alerts:
Fan Failure

[ ] Create a new alert that fires whenever this rule triggers

< BACK | NEXT | CANCEL

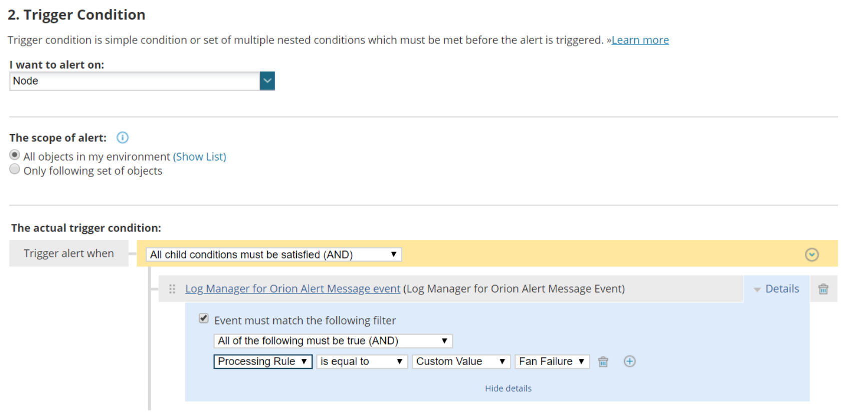
Editing a rule

When we did the research for the product, many users expressed a desire to connect log traffic to alerts. In many cases, a particular event may be an early warning for a later failure. It was perfectly reasonable, in a monitoring-focused product, to monitor log traffic.

Unfortunately, this didn't mesh well with our alerting architecture. Alerts are defined as a set of state conditions. The conditions are checked every fifteen minutes (by default). If the conditions are true, the alert is triggered and the user is notified.

Any changes to the legacy alerting builder UI were out of question. The code for this feature is complex and only understood by a handful of platform coders. The small Log Manager team had to work with what was already there.

We considered many architectural solutions. In addition to participating in those conversations, I created and user-tested wireframes for creating event alerts. Ultimately, we ended up using a little-known feature intended for alerting on change events.


2. Trigger Condition

Trigger condition is simple condition or set of multiple nested conditions which must be met before the alert is triggered. »Learn more

I want to alert on: Node

The scope of alert:
[✓ All objects in my environment] (Show List)
Only following set of objects

The actual trigger condition:

Trigger alert when: All child conditions must be satisfied (AND)

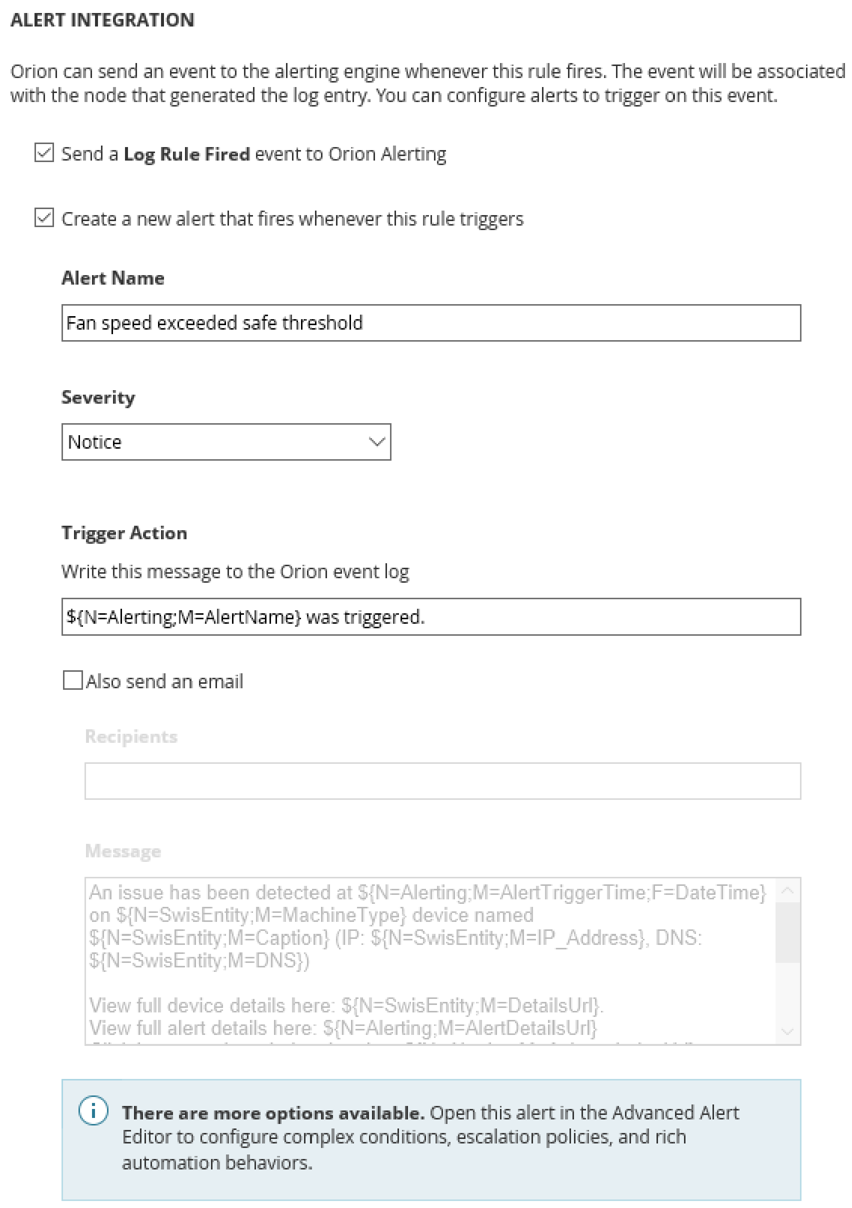
Log Manager for Orion Alert Message event (Log Manager for Orion Alert Message Event) — Details

[✓] Event must match the following filter
All of the following must be true (AND)
Processing Rule | is equal to | Custom Value | Fan Failure

Hide details

Good news: this solution could be constructed in a reasonable time frame with little risk. Bad news: the integration was buried in an obscure sub-menu, in a complex screen, on part two of a seven-step wizard. Not the ideal place for a banner feature.

I proposed replicating a limited subset the alert-construction task in the Log Manager UI. This allowed users to create complex alerts using the current screen context to populate the complex queries required for the alert to operate.


ALERT INTEGRATION

Orion can send an event to the alerting engine whenever this rule fires. The event will be associated with the node that generated the log entry. You can configure alerts to trigger on this event.

☑ Send a **Log Rule Fired** event to Orion Alerting

☑ Create a new alert that fires whenever this rule triggers

Alert Name

Fan speed exceeded safe threshold

Severity

Notice

Trigger Action

Write this message to the Orion event log

${N=Alerting;M=AlertName} was triggered.

☐ Also send an email

Recipients

Message

An issue has been detected at ${N=Alerting;M=AlertTriggerTime;F=DateTime} on ${N=SwisEntity;M=MachineType} device named ${N=SwisEntity;M=Caption} (IP: ${N=SwisEntity;M=IP_Address}, DNS: ${N=SwisEntity;M=DNS})

View full device details here: ${N=SwisEntity;M=DetailsUrl}.
View full alert details here: ${N=Alerting;M=AlertDetailsUrl}

There are more options available. Open this alert in the Advanced Alert Editor to configure complex conditions, escalation policies, and rich automation behaviors.

For most users, this produced their expected outcome - and alert that triggered when a particular log entry was received. Because we still constructed a normal alert, advanced users could still get into the gnarly details.