CS 453 - Application Lifecycle Management

TERM PROJECT

PROGRESS REPORT

Group Vitamin V2

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Table of Contents

1) Criteria

1.1) Quality of Documentation:

Having a set of detailed, organized and well written set of documentation is essential for an ALM tool. Since a typical incident management tool has a complex set of features which will be used by all the team members, having a good documentation set will improve the learning curve while a team adapts to the program.

OpsGenie:

> The documentation on OpsGenie is very comprehensive, it includes all of the advertised functionality as a separate page in their webpage. Moreover, they have dedicated pages for all of their APIs (RESTful and client) as well as a dedicated page which consists of “What does OpsGenie offer to this programs users”, “Functionality of Integration” and “Configuration of Integration” for each of their pre implemented integrations. Almost all of the documentation has visuals from the related user interfaces.

VictorOps:

> The documentation regarding Victor Ops is less optimal, the integrations page has all the information regarding a pre integrated tool however because of the tools are organised by categories finding a specific tool is less straightforward than OpsGenie. The presentented information for each tool answers the same questions Opsgenie does. The loss of usefulness is due to the VictorOps API documentation. VictorOps has only a main API which provides a crowded documentation without examples and visuals.

PagerDuty:

> The documentation regarding PagerDuty is very informative with a good amount of detail regarding both API and pre integrated tool documentation. However the pages are not well organised. The information one might require are scattered among their

knowledge base however, they have a well implemented search functionality build in therefore their usability regarding documentation is on par with OpsGenie.

1.2) Platform Compatibility:

An incident management tool is always in use however; a team member might not have access to a computer or a team could have members working on different operating systems. An alert management tool should be usable through different platforms like Android, iOS, Windows, Macintosh.

OpsGenie and both of its competitors VictorOps and PagerDuty mainly operate as a web application and have complementary iOS and Android applications. Moreover only Opsgenie provides a Blackberry application.

1.3) Scheduling for on-call engineers:

Reporting incidents to the developers is the essential functionality for an incident management tool, however as the scale of a project gets larger employees are divided into team or even teams of teams. At a large scale software project there will be many incidents and only a handful of employees will be qualified to take care of a specific problem. Because of this conveying the incident to a relevant person is a critical feature for an incident management system.

All of the considered applications have this feature as a customizable user interface. The distinctive feature is that how they manage to override schedules. This feature is important because all of the implementations of schedules are based on rotations however, we will need additional rotations in order to switch between vacation rotations,weekends and weekdays. VictorOps manages this by using scheduled overrides, at a fixed time the schedule which is currently in use gets changed with another schedule. PagerDuty manages this by using layers, in this system there exists multiple layers and when these layers are combined the final schedule is formed. The latest added layer overrides any intersections with previous layers. Finally OpsGenie manages this by using scheduling rules to use different rotations at different times. In this implementation there can be multiple rotations active at a given time

and intersections are not overwritten. A custom rule deactivates a rotation and activates another one instead.

1.4) Alert Delivery Escalations:

We cannot guarantee a solution or an answer to an incident even if the alert was directed to the right person. An on call engineer in a team can fail to respond or fail to solve the problem in a reasonable amount of time. In order to increase the possibility of a solution, an incident management tool should have methods of directing an alert to someone other than the initially contacted person. The rules for such escalations should be customizable to comply to the customer's company workflow. As an example if an on call developers fails to address an issue the tool might alert someone else on his team or his team leader.

OpsGenie and both of its competitors implement escalation policies as a set of rules. Each rule resolves to a target person, a team or a group of people. In all of the tools an escalation policy is a repeatable set of rules, the incrementations in the policy depends on the state of the alert. If the alert is not acknowledged or solved (depending on the rule) after a specified amount of time the target audience of the next rule will made aware of the alert.

In all of the tools, it is possible to configure these rules in a way that would comply to any procedure that a customer could want. The only noticeable difference is that only PagerDuty provides this functionality in their most basic plan. For OpsGenie and VictorOps escalation policies are added as a functionality in a subscription type one level above the most basic plan.

1.5) Integration time and ease

Integrating a tool to a current system must be easy and relatively quick. Since no company would like to deploy workforce to any integration process for too long, the system must be integrated to current tools and the project itself quickly and easily and must be compatible with as many tools as possible.

OpsGenie:

OpsGenie has the opportunity to integrate their system with 171 different tools. These integrations are explained in their documentation. Also they have an external Open API and Rest API for other usages.

VictorOps:

VictorOps has the opportunity to integrate with 94 tools, there is no indication of an Open API or RestAPI integration.

PagerDuty:

PagerDuty has the opportunity to integrate with 167 tools, there is also no indication of an Open API and RestAPI integration.

1.6) Security and Privacy Policies:

Security and Privacy Policies are important as the company using the tool shares their data, their log, issues and the personal information (i.e. phone numbers of the company employees). This criteria will evaluate the security and privacy policies of the companies in context, since any of these information is leaked or used without authorization, will indicate problem to the buyer.

OpsGenie:

Collects personally identifiable information, such as name, email, or phone number. Collects the browser information web beacons, or unique device identifiers from the browser. Also they collect information about the usage of the application itself. These information may be used by sharing your personal and anonymous information with other companies, including vendors and contractors. They have a strict policy that they would not share any information to any advertising companies. Other data collected is only used for the application itself to run and function. There is no information about the security of their system.

VictorOps:

Collects personal information given by the user, also if the user has connected to the system using any social media app, collects information from there including friends. Also the system itself collects IP addresses and places cookies. The information collected may be given to 3rd party service providers and these providers are forced to use the data given just to provide the service. Also in regards of security, VictorOps advises the company that the data passed on to VictorOps is a part of an overall security and privacy strategy and need to take steps according to that.

PagerDuty:

Collects the information given by the visitors (i.e users of the application.) Also the user's IP address, browser information, OS, domain name and timestamp are collected to provide a better service. Payment is made through a 3rd party application, which has its own privacy policy. PagerDuty provides a secure system, which is validated by ISO27001 and FedAMP. Communication throughout the system is secured with IPsec tunnels and the data is stored in multiple distributed systems to ensure security and integrity.

1.7) Analysis of incident data:

Analysing the previous incident data can help in seeing the difficulties happened in the past. By this way in future projects teams can spot where they did wrong. Implementation of this feature allows the teams to proactively understand where and why incidents happen, therefore enabling them to decrease the frequency and impact of possibly recurring incidents.

OpsGenie and VictorOps both keep detailed information about each alerts and keeps their logs when an action is taken for that alert, sort those alerts according to the alerts priority, its status and so on, but other than these features, they don't provide any more analysis features.

PagerDuty shows the incidents happening in real time and plots graphs that shows the regularity of such incidents, provide insights using machine learning, uses granular analytics to understand the system and efficiency.

1.8) Reliability:

When dealing with incident management tools reliability means that alerts are delivered to their recipients when it counts. Also it is important for such a tool to keep track of these alerts and ensure that alerts are not lost. All of the tools that we looked at provide more or less the same reliability. And all have customer supports for when something that goes wrong with their system, they would be able to solve the incident within a short time period.

1.9) Alert Tracking:

Alert tracking, as the name suggests, keeps track of all the incident alerts. This is useful when handling bugs and changes happening in a project. This allows users to keep track of every alerts that are happening and react to those alerts accordingly. OpsGenie provides an organised and easy to use interface for alert tracking.

When using OpsGenie, an alert can be open, closed, acknowledged, unacknowledged. These alerts also may be assigned to certain users and users can see the alerts that are assigned to them. Firstly to react to an alert, it should be opened first. Any user or integrated tools can open an alert and write a message about the alert, create tags, assign teams to that alert and assign a person to that alert. You can easily integrate over 100 different tools to send the occurring incidents to OpsGenie. Information about how to integrate these tools are provided in OpsGenie's documentations and are pretty easy to follow. After that the alert could be seen in alerts tab and anyone can acknowledge that alert if nobody is assigned to that alert. If a team or a person is assigned to an alert they will be notified according to their chosen notification type, this can be e-mail, sms, a phone call or via mobile app. After this when the alert is handled assigned user can close that alert. When a user reacts to an alert, i.e a user acknowledging an incident, are logged so that they can be reviewed.

The other tools that we compare OpsGenie to, VictorOps or Pagerduty, functions pretty much the same way. They all can create alerts both automated and manually, send these

alerts as notification to the designated people and provide a mobile app for further customisations for alerts.

1.10) Customer Support:

Customer support is becoming more and more essential for technologic companies as their products get more complex. ALM tools, in our case incident management tools, have a varying set of features and integration cases. Due to complexity of these tools, documentation, no matter how well-written it is, may not be enough. Therefore, customer support a necessity.

In this regard all tools provide customer support according to the customers' choice of account type. As customer chooses to use a more advanced account type, s/he gets a more advanced customer support experience.

OpsGenie:

> OpsGenie Lite accounts can only benefit from email support. Basic accounts can benefit from email and chat support. Enterprise and Enterprise+ accounts can both benefit from 24/7 e-mail, chat & phone support.Also all types of accounts can benefit from community service.

PagerDuty:

> Additional to OpsGenie, PagerDuty provides its customers with knowledge base and data retention. Lite accounts can benefit from 1 year data retention. Basic accounts can benefit from email and chat support and 1 year data retention. Standard accounts can benefit from award winning phone, chat and email support and unlimited data retention. Enterprise accounts can benefit from designated customer success manager, award winning phone, chat and email support and unlimited data retention. Similar to OpsGenie, all account types of PagerDuty can benefit from knowledge base and community services.

VictorOps:

In VictorOps' website, they mention they offer one-on-one technical expertise ,day or night. However, when account types are investigated, their most basic account type, named Getting Started, does not give information about what kind of customer support is provided. Essentials accounts can benefit from phone, email and chat support. Full-stack accounts can benefit from phone, email and chat support and unlimited data retention. VictorOps also offers custom pricing and what kind of customer support provided is not specified for these accounts, either. Similar to PagerDuty, VictorOps also provides knowledge base for all of its customers.

1.11) Supported Communication Channels:

Since incident management tools are being used for alerting people in times of crisis, it is crucial for an oncall developer to be notified. If the alerts are time sensitive and rapid response is necessary, reaching oncall developers especially after work hours can be tough. Therefore, supporting a variety of communication channels such as email, SMS, phone call, push notifications is a necessity for an incident management tool.

In this regard, OpsGenie, PagerDuty and VictorOps support different communication channels: email, SMS, phone, and mobile push. All tools allow their users (each team member) to customize their notification preferences.

1.12) Ease of Setup

An incident management tool is, like other ALM tools, a helper of the developers'. It aims to gain time for the developer. That's why, to avoid waste of time, the setup of the tool should not take long.

OpsGenie, PagerDuty and VictorOps are all cloud-based incident management systems that are provided as a service. The setup of the tools consists of creating an account and inviting teammates.

1.13) Expandable notifications(html,doc,pdf,log)

Incident management tools work like most ALM tools, however, they are more useful when there is a crisis on the product that is already in the market. To understand the problem within the system, incident tools should give detailed information about the problem. Detailed information can help developers to solve the problem much faster and easier. To give this information with more detail, when the system gives the alert code it should send an e-mail or a pdf report about the problem. In order to achieve this, expandable notifications should be used to inform the developers in a detailed way. Expandable notifications create a detailed error description on the system in order to send it to the developer. Developers can see a detailed error description and understand the problem thoroughly.

OpsGenie:

> OpsGenie has a rich notification feature which is allow the user to see the alerts in a detailed way. When the user gets notified for an alert it also sends files or additional fields about the alert.

PagerDuty:

> Pagerduty has a HTML email notification feature which allow users to see details about the alert and it also allows users to see health of the program. When the user is notified, if user enabled rich text HTML email, user can see the detailed version of the alert.

VictorOps:

> In VictorOps, after the system sends an alert it allows you to see health of the system and create a conversation with domain expert. It also sends an email about problem and its details.

1.14) Event Transparency

Transparency is important in the software sector. In a project every participant should be able to understand what is going on, the progress and the problems within the product. In incident tools , alerts should be understandable by the developers as alerts are sent one by one, and this is achieved by event transparency.

In event transparency VictorOps shows more detail then OpsGenie and Pagerduty. It shows the alerts with incident timeline, centralized system activities, user interactions etc. Therefore, VictorOps is one level forward then OpsGenie and Pagerduty.

1.15) Usability

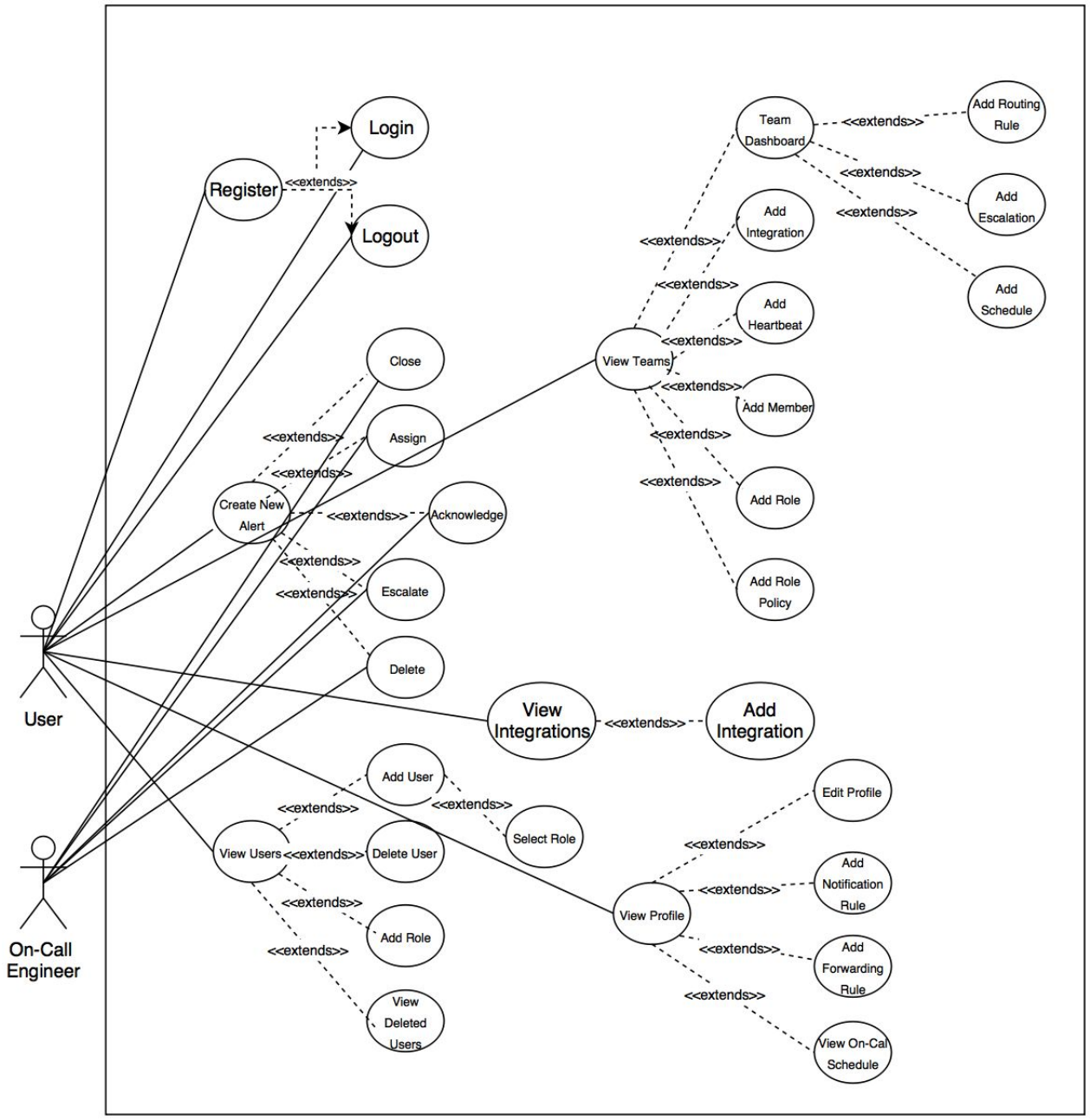
Incident tools are complicated tools because they got a lot of integrations and managing these integrations is really hard for the system and also for the user. To minimize the complexity, user interface should be easy to understand.If the UI is easy to comprehend, the user will have an easier time to understanding the application. Therefore, the system must follow the best practices for UI/UX design.

Since these tools have many integrations available within them, managing these integrations will decrease usability of the applications.

2) Competitive Feature Matrix

Criteria	OpsGenie	PagerDuty	VictorOps
Quality of Documentation	✓✓✓✓✓	✓✓✓✓	✓✓✓
Platform Compatibility	✓✓✓✓✓	✓✓✓✓✓	✓✓✓✓✓
Scheduling for on-call engineers	✓✓✓✓✓	✓✓✓✓✓	✓✓✓✓✓
Alert Delivery Escalations	✓✓✓✓	✓✓✓✓✓	✓✓✓✓
Analysis of incident data	✓✓	✓✓✓✓✓	✓
Reliability	✓✓✓✓✓	✓✓✓✓✓	✓✓✓✓✓
Alert Tracking	✓✓✓✓✓	✓✓✓✓✓	✓✓✓✓✓
Customer Support	✓✓✓	✓✓✓✓✓	✓✓✓✓
Supported Communication Channels	✓✓✓✓	✓✓✓✓	✓✓✓✓
Ease of Setup	✓✓✓✓✓	✓✓✓✓✓	✓✓✓✓✓
Expandable notifications	✓✓✓	✓✓✓	✓✓✓✓
Event Transparency	✓✓	✓✓	✓✓✓✓
Usability	✓	✓	✓
Security and Privacy	✓	✓✓✓✓✓	✓✓
Integration time and ease	✓✓✓✓✓	✓✓✓	✓

3) Use Case Scenario

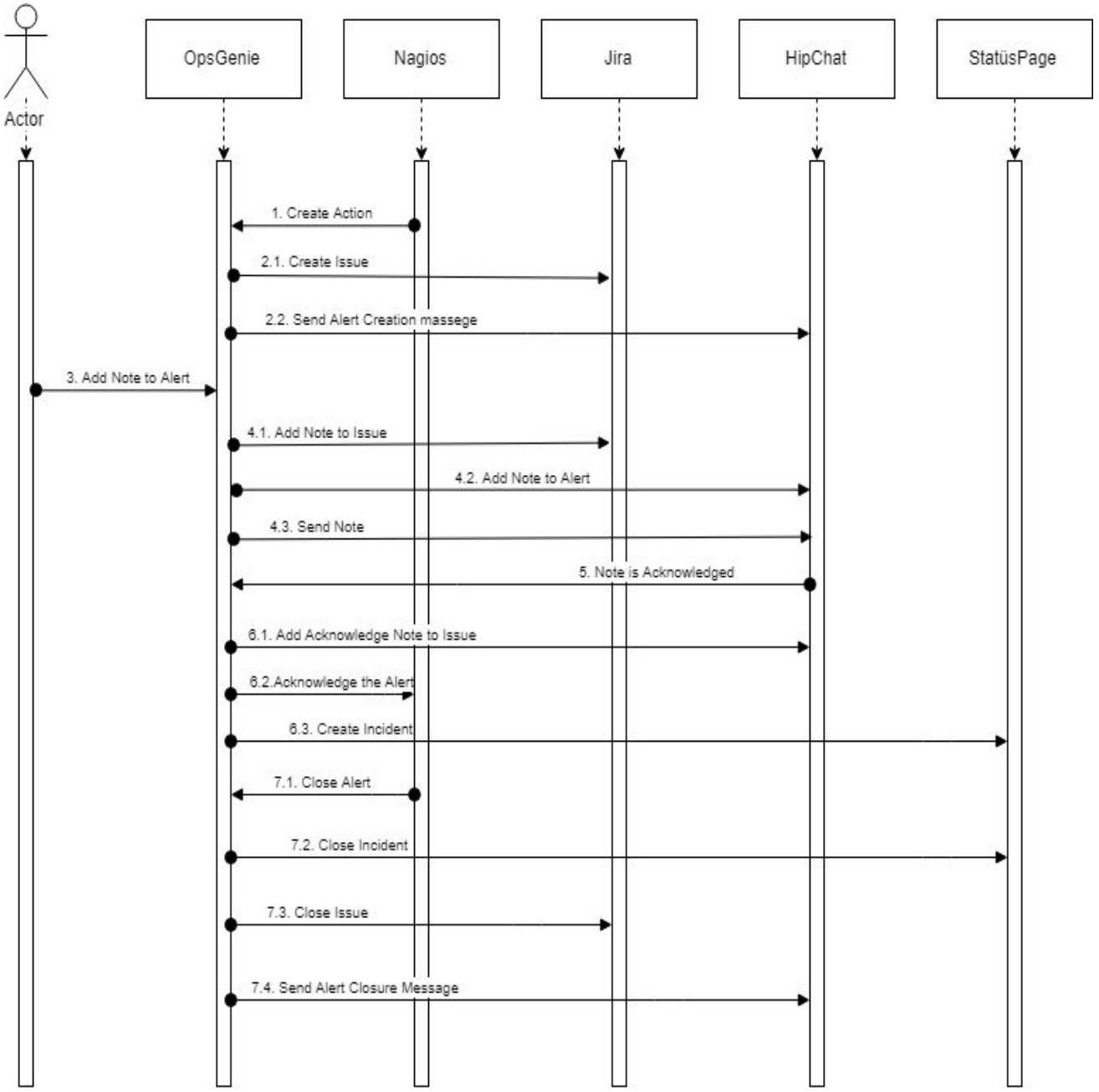


If a user wants to use OpsGenie, first, she/he should create an account and register to the system then, login. Through Profile Page, User can edit her/his profile, manage her/his notification and forwarding rules and see her/his on-call schedule. To be able to work with a team, the user should add users. In Users Page, s/he can add, delete or view deleted users, also, can add roles to assign to added users. Then to assemble the tam, Team Page should be used. Through this page, the user can add routing

rule, escalation, schedule, integration, heartbeat, member, role and role policy. Through the Integrations Page, user can integrate other ALM tools to OpsGenie. Without other tools, user herself/himself can create alerts through Alerts Page. When alert is created, the user or other team members can assign the alert to one of them or they can delete, acknowledge, close or escalate it.

4) Sequence Diagrams

4.1) OpsGenie + Nagios + StatusPage + JIRA + HipChat In Action



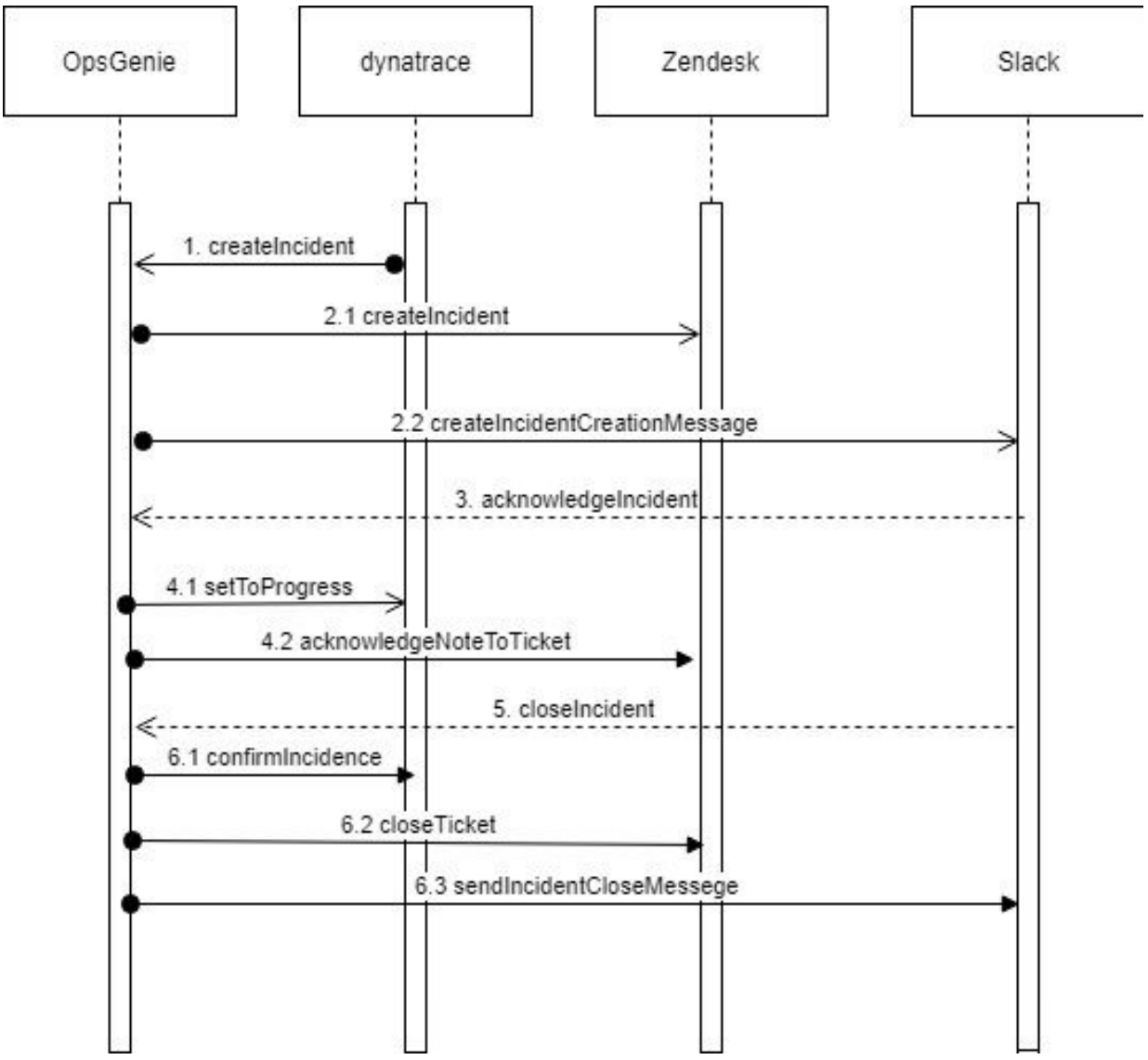
- The JIRA integration that OpsGenie provides enables users to get notifications throughout the process starting with incident acknowledgement until incident solution and closure. The information regarding the incident is dynamically updated by OpsGenie.

- The HipChat integration OpsGenie provides allows OpsGenie to use HipChat as an alert channel. Therefore teams can work on solutions regarding the incident using HipChat as a communication channel.

- The StatusPage integration OpsGenie providers allows OpsGenie to dynamically update a service status in StatusPage in order for it to comply with the state changes caused by the incident. The integration can be configured to update the StatusPage when an alert is acknowledged, closed or escalated.

- OpsGenie's integrations with monitoring tools allows OpsGenie to update the source monitoring tools with the alert details which could contain notes and attachments as well as the alert and alert status.

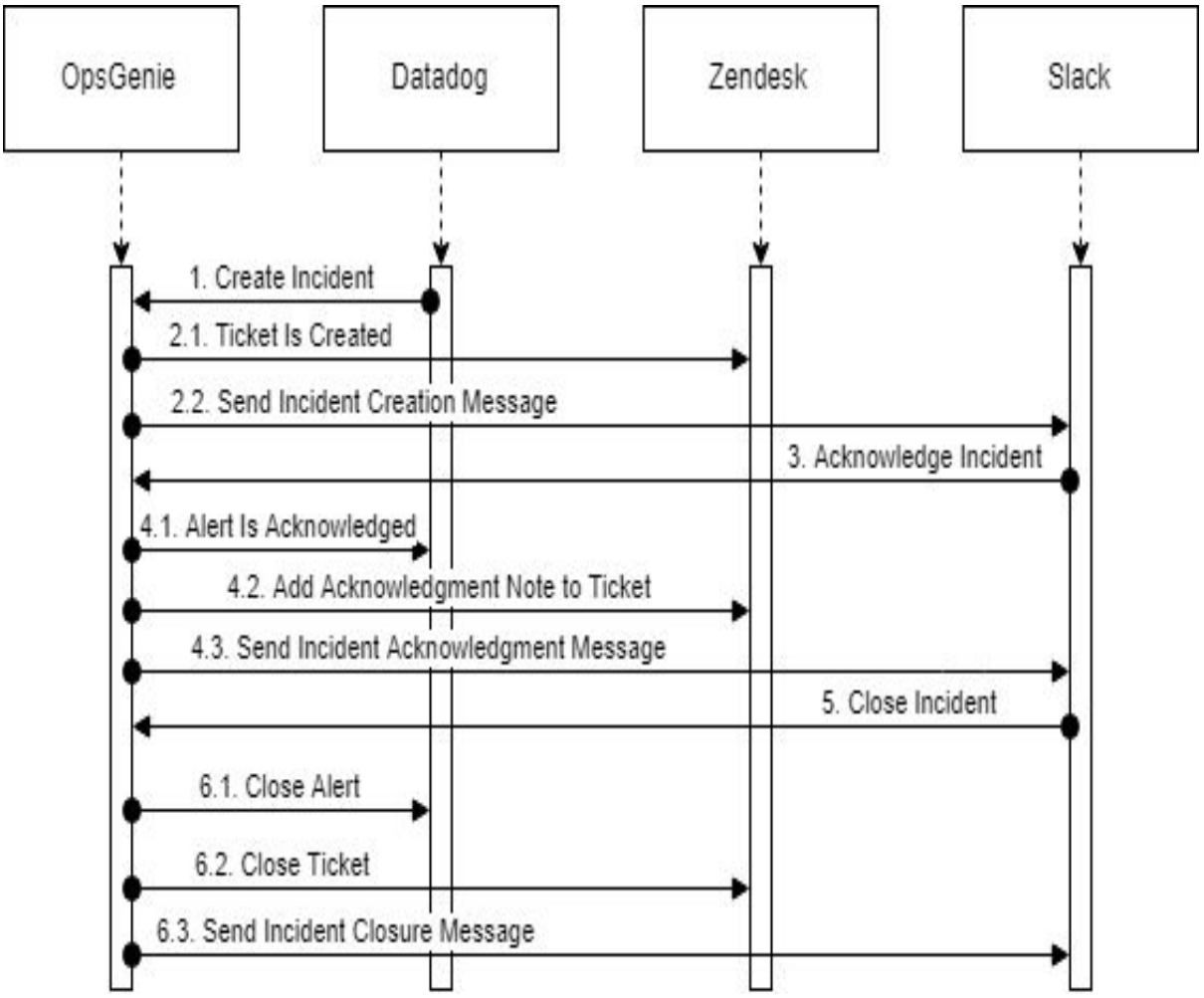
4.2) OpsGenie + Dynatrace AppMon + Slack + Zendesk In Action



- Monitoring tool integrations enables OpsGenie to take incidents created in monitoring tools in order to deliver the relevant alerts to the right people.
- OpsGenie's Zendesk integration allows OpsGenie to automatically manage Zendesk tickets. Alert acknowledgment and addition of a new note is dynamically synced with Zendesk automatically.

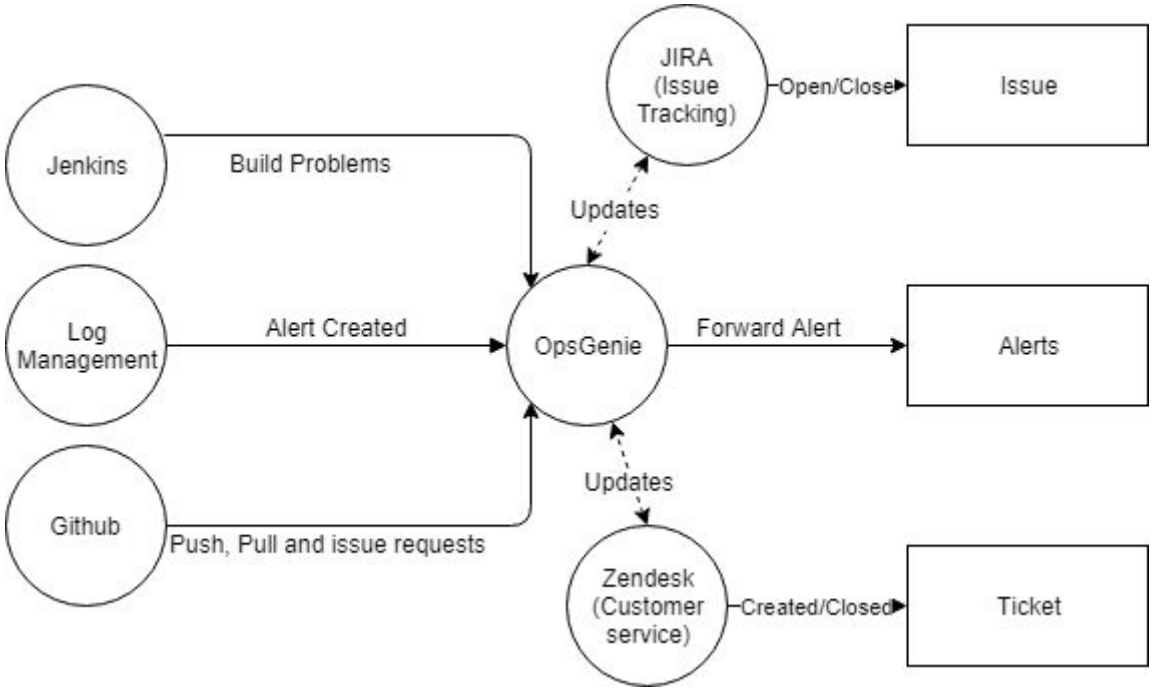
- The Slack integration allows for Slack to be used as an alert delivery channel by OpsGenie. This enables teams to use Slack to communicate in order to solve an incident.

4.3) OpsGenie + Datadog + Slack + Zendesk In Action



5) Integration Diagrams With Other ALM Tools

5.1) One Way Integrations With Other ALM Tools



5.2) Two Way Integrations With Other ALM Tools