Integrating with Third-Party Tools using Splunk Alert Actions

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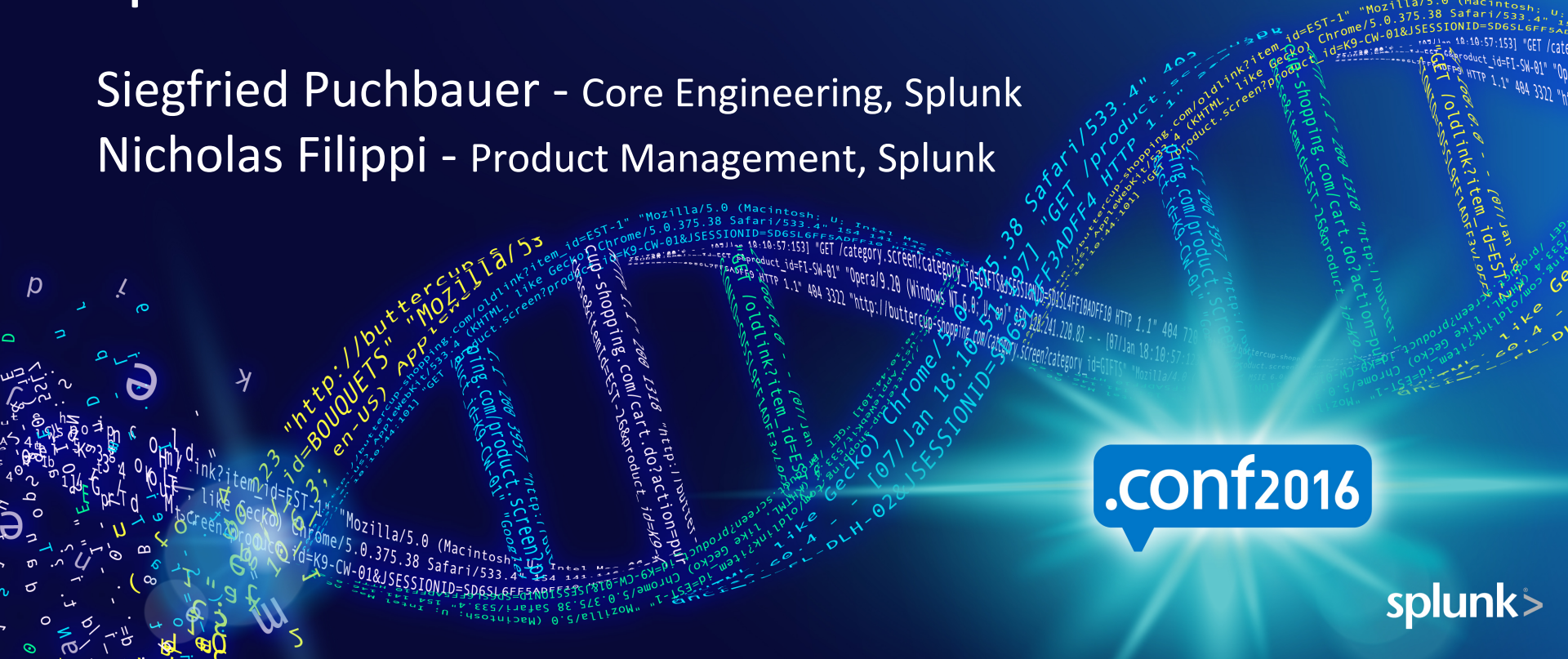

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brought to you by…

Siegfried Puchbauer

- Lead Engineer, Dashboard Team
- Expert in Dashboards, Alerting, Javascript, and Bowler Hats

Nicholas Filippi

- Product Management, Splunk
- Responsible for Dashboards & Info Delivery

You are here because…

- Interested in connecting splunk to 3rd party systems
- Exploring the splunk developer platform
- Want to see something cool!
- Technical skills required
  - Development experience (preferably python)
  - Basic splunk app packaging experience

Agenda

- Alert Actions Framework Overview
- Demo
- Live Coding – Build alert action from scratch

Disclaimer

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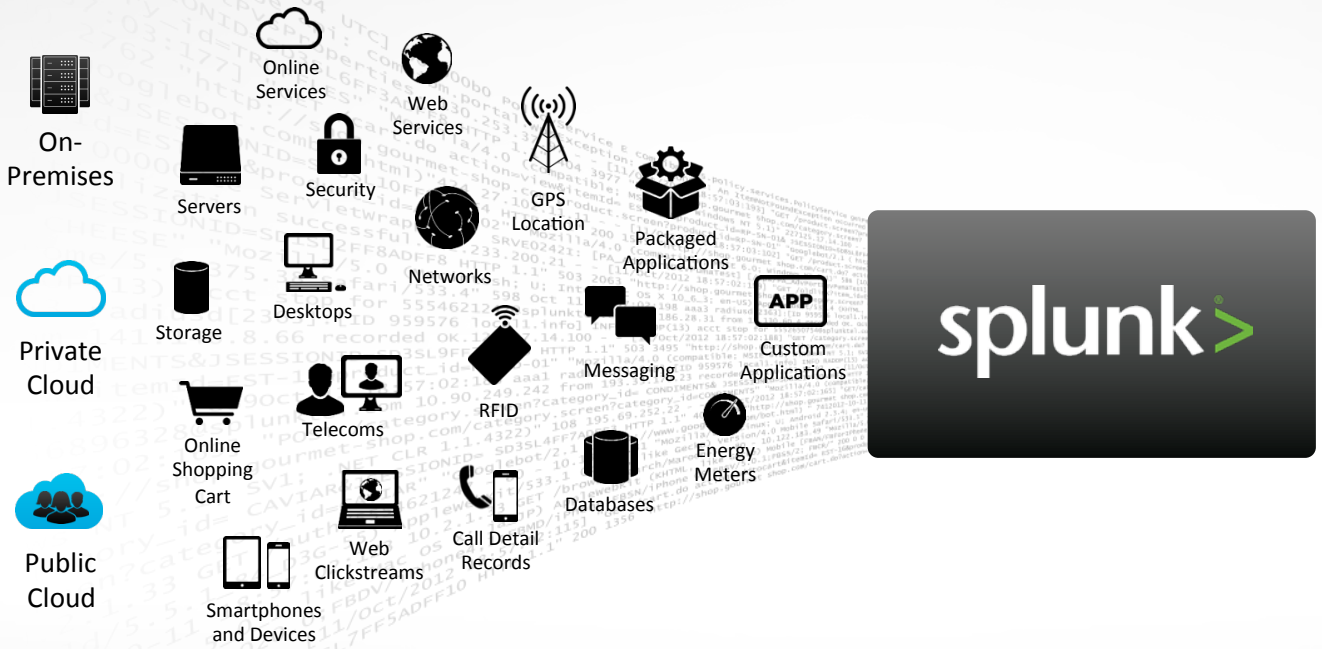
Make machine data accessible, usable and valuable to everyone.

Turning Machine Data Into Business Value

Index Untapped Data: Any Source, Type, Volume

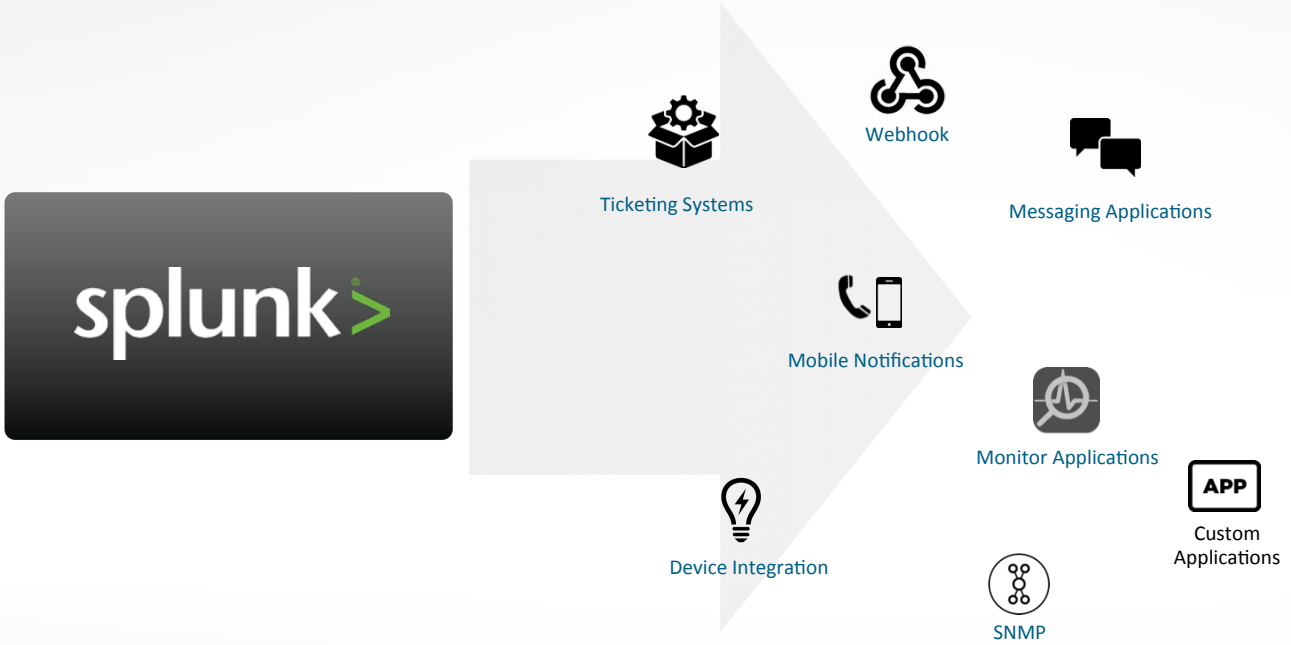


Ask Any Question

- Application Delivery
- IT Operations
- Security, Compliance and Fraud
- Business Analytics
- Industrial Data and the Internet of Things

Turning Machine Data Into Business Value

Integrate with other applications to automate workflows and improve efficiencies

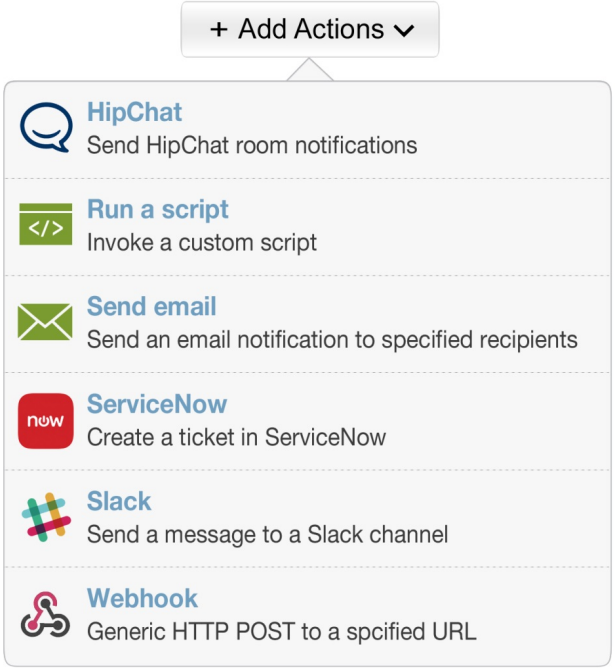


- Application Delivery
- IT Operations
- Security, Compliance and Fraud
- Business Analytics
- Industrial Data and the Internet of Things

Custom Alert Actions

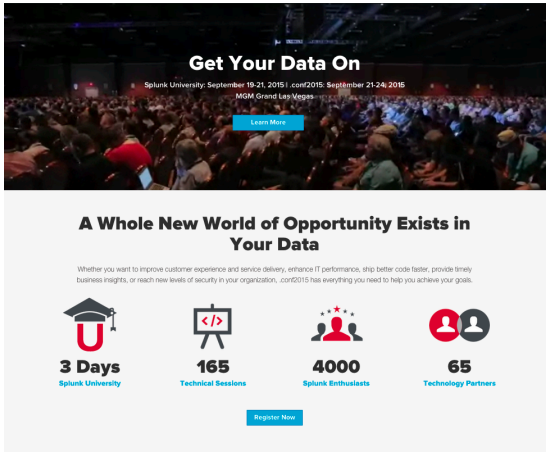
Use Splunk Alerts to trigger & automate workflows

- Allows packaged integration with third-party applications
- Simple admin/user configuration
- Developers can build, package, and publish alert action extensions for native integration to Splunk
- Growing list of integrations available



Real-world Example

Data Source



Monitoring mobile accelerometer data during keynote presentation.

Search & Trigger

Query:

```
index=main sourcetype=load
| stats avg(load) as avg_load
| search avg_load > 89
```

Use Splunk to trigger if average load exceeds threshold of 89

Alert Action

Trigger an air cannon to fire Splunk ponies into the crowd.

Alert Action Examples

- Notification Services
  - Send message to IM clients (HipChat, Slack)
  - Send SMS
- Incident Remediation / Ticketing
  - Automate the creation of tickets (ServiceNow, Jira)
- IT Monitoring
  - Send incident/alert into monitoring tools (xMatters, BigPanda)
- Security
  - Take action or send events to firewalls, devices, management consoles
- Internet-of-Things
  - Trigger device-level actions (change lights, sounds an alarm, send action to device)
- Custom Action
  - Trigger any organization-specific action (restart application, integrate with homegrown service, and more)

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Alert Action Framework

✔	**Packaging**	Package and distribute custom alert actions within apps
✔	**UI Integration**	Build UI to support user input parameters within the alert workflow.
✔	**Management**	Admin-level management to enable/disable, view usage stats, and more
✔	**Permissions**	Access controls (configure role-level restrictions/permissions to access these alert actions)
✔	**Logging**	Logs both splunkd process level as well as script-level to internal index
✔	**Input Validation**	Perform user input validation on save of a given alert
✔	**Dynamic Parameter Support (w/ token substitution)**	Define parameters to be passed on script invocation; Available token substitution for 1st result and search/job/server endpoints

Alert Action Framework

✔	**Multi-platform Compatibility**	Package multiple scripts to run based on platform type (Windows, Linux)
✔	**Secured Storage of Credentials**	Encrypt sensitive credentials on disk, with access methods to read/write from your alert script
✔	**Ad-Hoc Invocation**	Invoke directly from query string or workflow actions for testing or targeted use cases
✔	**Setup/Configuration**	Leverage the app setup.xml to persist global-level script parameters. These parameters can also be layered with invocation-specific parameters.
✔	**Runtime Arguments (Language Agnostic)**	Specify runtime parameters (ex., java interpreter and argument flags)

Demo!

Alert Action: From Scratch

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Resources

Available information relevant for developers and admins

- Splunk Docs
  - http://docs.splunk.com/Documentation/Splunk/6.3.0/AdvancedDev/ModAlertsIntro
  - http://docs.splunk.com/Documentation/Splunk/6.3.0/Alert/Setupalertactions#Webhooks
- Splunkbase
  - Partner Apps
    - xMatters, BigPanda, Twilio, ServiceNow, Octoblu
  - Internal
    - Hipchat, Slack, Hue Bulbs
- Developer Guidance
  - Updated chapter on alert actions
  - Reference implementation – Atlassian Jira Integration

Wrap-Up

- Use Splunk Alerts to Automate Workflows & Integrate with External Applications
  - Notification/Messaging Services, Incident Remediation (Ticketing) Solutions, IT Monitoring Tools, Security Solutions, Internet-of-Things Devices, and Custom Applications
- Use Custom Alert Actions via the “Add Actions” scheduled alert menu
- Manage Alert Actions via “Settings > Alert actions” page
  - Find more alert actions to install via “Browse more”
- Leverage Docs/Examples/Developer-Guidance to Develop a Custom Alert Action

THANK YOU

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Developer Guide

Build a new alert action

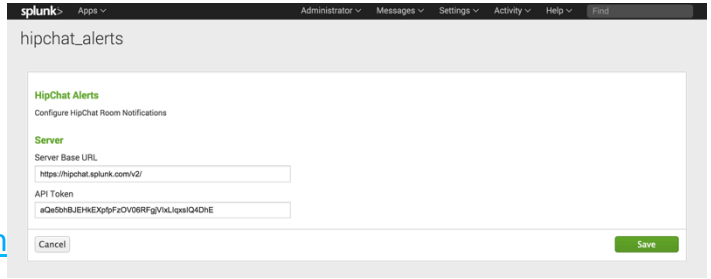
Steps

1. Alert action definition (alert_actions.conf)
2. Alert action script (in <app>/bin)
3. UI for configuring the alert action (HTML)
4. Spec for custom parameters
5. Optionally:
   - Icon
   - Validation rules
   - App setup

Example Alert Action

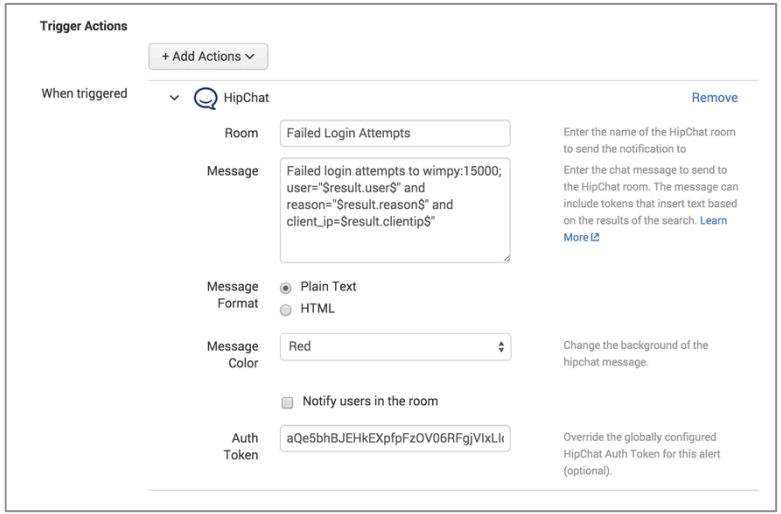
- Atlassian Hipchat (Group Chat)

- API v2 – Send Room Notifications
  - https://www.hipchat.com/docs/apiv2/method/send_room_notification



- Custom Alert Action – Includes:
  - App setup page to specify Hipchat server URL & API Token

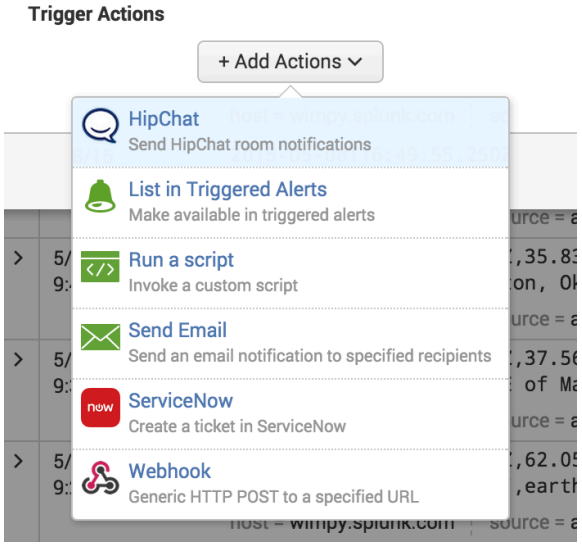
  - For each alert, user should be able to configure
    - Room
    - Message
    - Format (plaintext, html)
    - Message color
    - Notify users?



Registration

default/alert_actions.conf

```
[hipchat]

is_custom = 1

label = HipChat
description = Send HipChat room notifications
icon_path = hipchat_alert_icon.png

payload_format = json

disabled = 0

param.base_url = https://api.hipchat.com/v2/
param.auth_token =
```



Alert Script or Binary

- <app>/bin/<name>
  - **bin/hipchat.py**
- Carries out the actual alert action logic
- Receives XML or JSON payload from Splunk when invoked
- Supposed to be short-lived
  - Terminate as soon as action has been executed
- Python, shell scripts or binaries
- Multi-platform/architecture support

Execute a custom command

- Execution command/ arguments
  - Override default filename/path
  - Specify custom interpreter
  - Pass args

default/alert_actions.conf

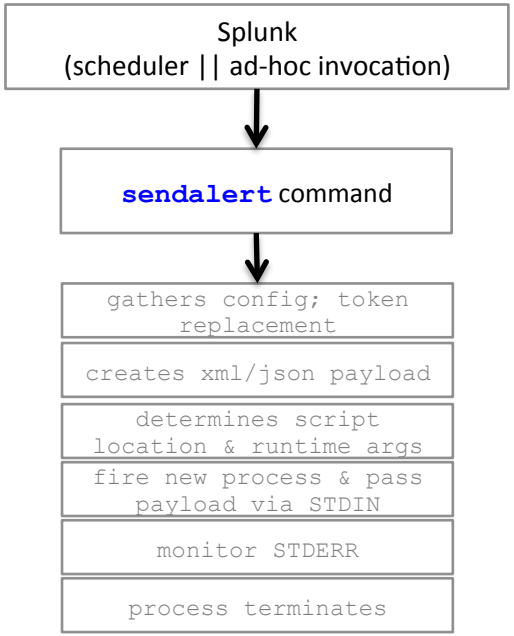
```
[myaction]
...
alert.execute.cmd = java.path
alert.execute.cmd.arg.0 = -jar
alert.execute.cmd.arg.1 = $SPLUNK_HOME/etc/apps/myapp/bin/my.jar
alert.execute.cmd.arg.2 = --execute
```

Multi-Platform Compatibility

- Determines the alert script or binary to execute using the below precedence

  - $SPLUNK_HOME/etc/apps/<app_name>/<arch>/bin
    - (arch : linux_x86_64, darwin_x86_64, windows_x86_64, windows_x86)
  - $SPLUNK_HOME/etc/apps/<app_name>/bin

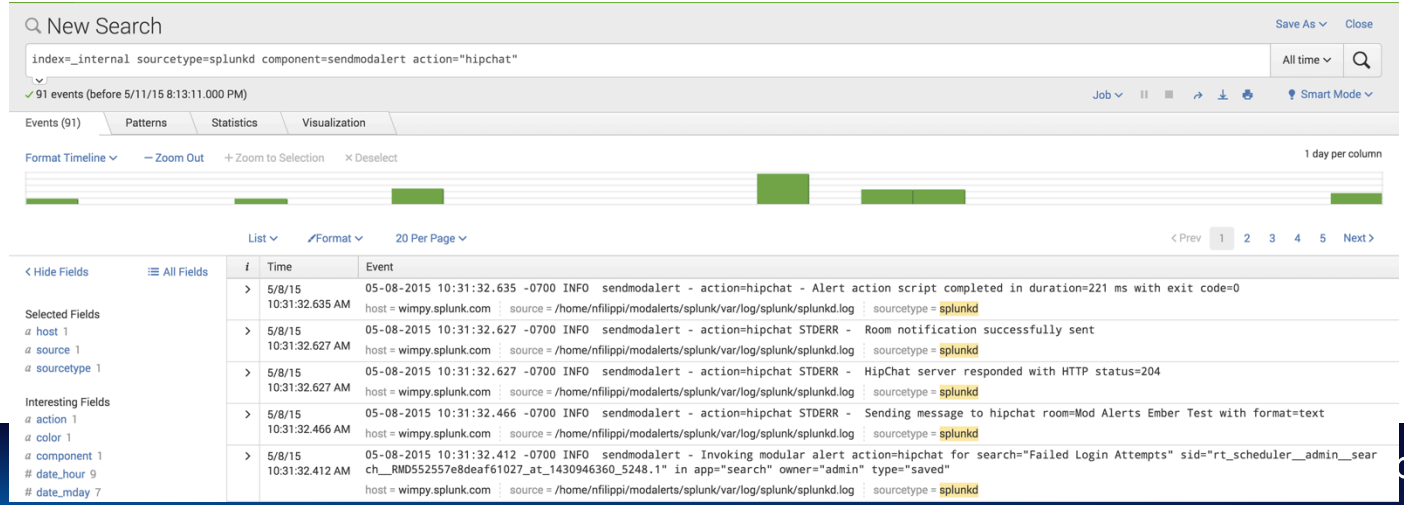
Script Invocation (Example)




```
{
    "server_host": "localhost:8089",
    "server_uri": "https://localhost:8089",
    "session_key": "1234512345",
    "results_file": "/opt/splunk/var/run/splunk/12938718293123.121/results.csv.gz",
    "results_link": "http://splunk.server.local:8000/en-US/app/search?sid=12341234.123",
    "sid": "12341234.123",
    "search_name": "My Saved Search",
    "owner": "admin",
    "app": "search",

    "configuration": {
        ”room”: ”DevOps",
        ”message”: ”Failed login attempts to wimpy:15000; user=‘Jeff’ and reason=‘user-initiated’
and client_ip=‘10.14.0.186’”,
        “message_format”: “plain”,
        “base_url”: “https://api.hipchat.com/v2/”,
        “auth_token”: ”KJHJKHJGJHLKNJBLJBJBL”
    },
    "result": {
        "sourcetype": "splunkd_access",
        "count": "24”,
        “user”: “Jeff”,
        “client_ip”: “10.14.0.186”
    }
}
```

Logging

- Messages printed to STDERR are logged to splunkd.log
- Direct access to alert action logs linked from “Alert actions” manager page (via “**view log events**”)
  - Includes both (a) splunkd logs for alert action, and (b) alert-specific log
- Search Query
  - index=_internal sourcetype=splunkd component=sendmodalert action=”<action_name>"



UI Integration

default/data/ui/alerts/hipchat.html

```
<!-- Defines UI to be rendered in the alert workflow (w/ data binding to savedsearch.conf params) -->

<form class="form-horizontal form-complex">
    <div class="control-group">
        <label class="control-label" for="hipchat_room">Room</label>

        <div class="controls">
            <input type="text" name="action.hipchat.param.room" id="hipchat_room" />
            <span class="help-block">Enter the name of the HipChat room to send the notific
        </div>
    </div>
    <div class="control-group">
        <label class="control-label" for="hipchat_message">Message</label>

        <div class="controls">
            <textarea name="action.hipchat.param.message" id="hipchat_message"></textarea>
            <span class="help-block">
                Enter the chat message to send to the HipChat room.
                The message can include tokens that insert text based on the results of the search.
                <a href="{{SPLUNKWEB_URL_PREFIX}}/help?location=learnmore.alert.action.tokens"
target="_blank"
                   title="Splunk help">Learn More <i class="icon-external"></i></a>
            </span>
        </div>
    </div>
…
```

Note: Currently, we only support static html (filter out any javascript). Markup should follow the bootstrap syntax (http://getbootstrap.com/2.3.2/base-css.html#forms

Spec Files

README/alert_actions.conf.spec

```
# Defines parameters that to be added to
the alert_actions.conf specification

[hipchat]

param.base_url = <string>
* HipChat API base URL - adjust if you're
using you own server on premise

param.auth_token = <string>
* HipChat OAuth2 token
* see https://www.hipchat.com/docs/apiv2/
auth
```

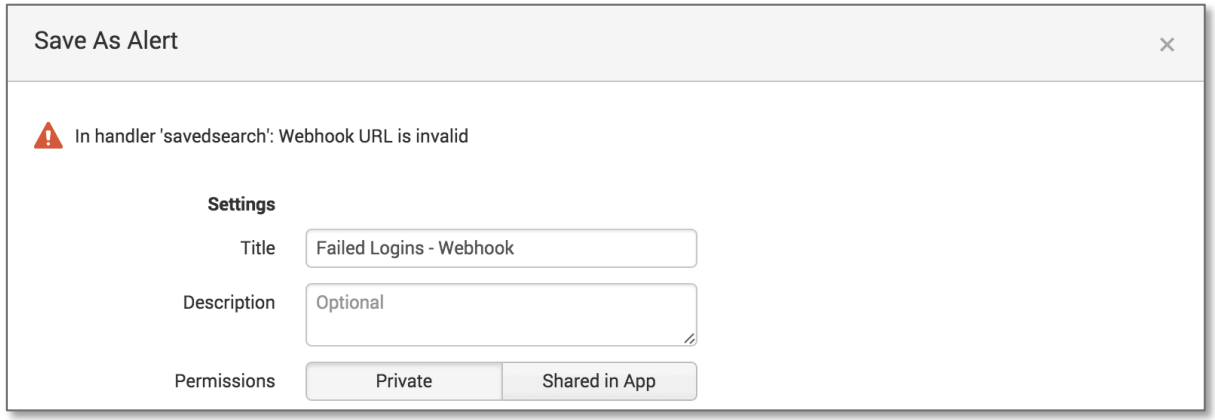
README/savedsearches.conf.spec

```
# Defines parameters that to be added to the
savedsearches.conf specification
# HipChat alert settings

action.hipchat = [0|1]
* Enable hipchat notification
action.hipchat.param.room = <string>
* Name of the room to send the notification to
action.hipchat.param.message = <string>
* The message to send to the hipchat room.
...
```

Input Validation

Available via restmap.conf

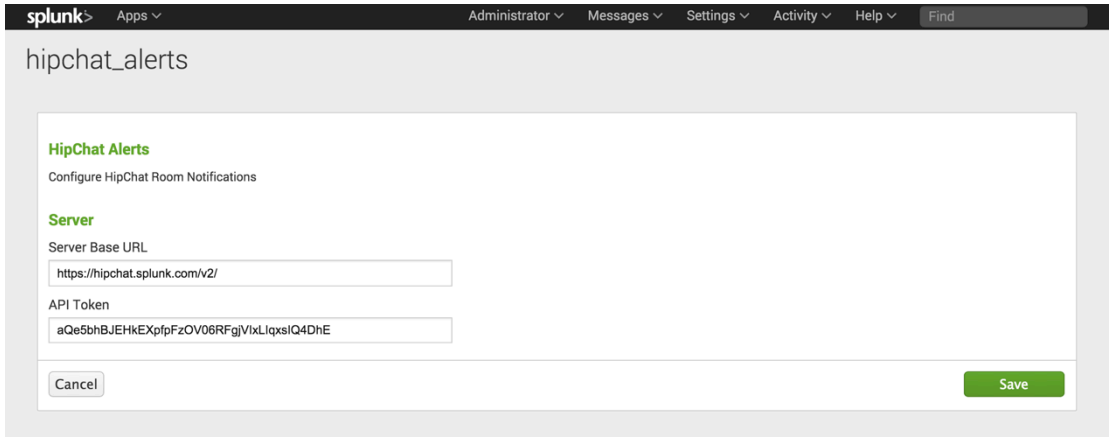
```
[validation:savedsearch]
action.webhook.param.url = validate( match('action.webhook.param.url',
        "^https?://[^\s]+$"), "Webhook URL is invalid")
```



Setup & Configuration

- Available via app-level setup.xml
  - http://docs.splunk.com/Documentation/Splunk/6.3.0/AdvancedDev/SetupApp
  - http://docs.splunk.com/Documentation/Splunk/6.3.0/AdvancedDev/SetupXML

- Linked from “Alert actions” manager page



Secure Storage of Credentials

- Leverages Splunk's storage/passwords endpoint for CRUD operations
  - http://docs.splunk.com/Documentation/Splunk/6.2.3/RESTREF/RESTaccess#storage.2Fpasswords
- Note: This can only be used for global-level alert action settings (not per-alert)
- Required Steps:
  - Add entry to app.conf
    - (ex. "[credential::hipchat_api_token:]")
  - Update setup.xml to write to storage/passwords endpoint
    - (ex. '<input endpoint="storage/passwords" entity=":hipchat_api_token:" field="password">')
  - Update script to get secure credentials from splunkd endpoint

default/bin/hipchat.py

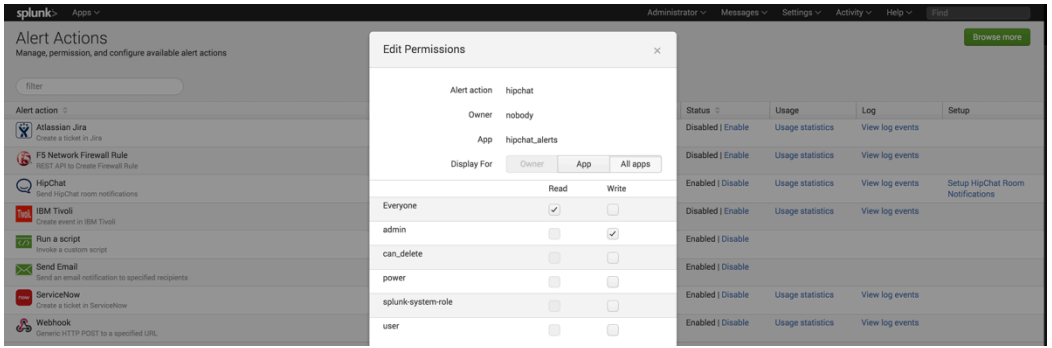
```
...
def get_api_key(payload):
    url_tpl = '%s/servicesNS/nobody/hipchat_alerts/storage/passwords/%%3Ahipchat_api_token%%3A?output_mode=json'
    req = urllib2.Request(url_tpl % payload.get('server_uri'), None,
                          {'Authorization': 'Splunk %s' % payload.get('session_key')})
    res = urllib2.urlopen(req)
    body = json.loads(res.read())
    return body['entry'][0]['content']['clear_password']
...
```

Access Control

- Packaged alerts actions should set to global
  - Via **metadata/default.meta**

```
[alert_actions/hipchat]
export = system
```

- Enable role-level permissions via “Alert actions” manager page



Packaging

- **App can package more than 1 alert action**

- **Packaged files support**
  - Registration as an alert action
  - Script itself
  - UI integration
  - Configuring alert/search parameters
  - Permissions (exporting to global)
  - Default param values
  - Etc.

Example folder/file structure of an app shipping a mod alert action

```
hipchat_alerts
├── appserver
│   └── static
│       ├── appIcon.png
│       └── hipchat_icon.png
├── bin
│   └── hipchat.py
├── default
│   ├── alert_actions.conf
│   ├── app.conf
│   ├── restmap.conf
│   ├── setup.xml
│   ├── data
│   │   └── ui
│   │       └── alerts
│   │           └── hipchat.html
├── README
│   ├── alert_actions.conf.spec
│   └── savedsearches.conf.spec
└── metadata
    └── default.meta
```

THANK YOU

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