The ‘state’ of Splunk

Using the KVStore to maintain App State

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Agenda

- Why do we need a state store for apps?
- App KV Store overview
- App KV Store example app & code
- Configuration & API
- Summary
- Looking ahead
- Q&A

Houston, We Have…

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What's The Problem To Solve?

- Managing and using non-event data required csv files or external data stores
- Keeping state in an application to enable user workflow was not easy
- Keeping processing state (checkpoint data) in a modular input
- No mechanism to distribute dynamic state or data for search time event enrichment

App KV Store Overview

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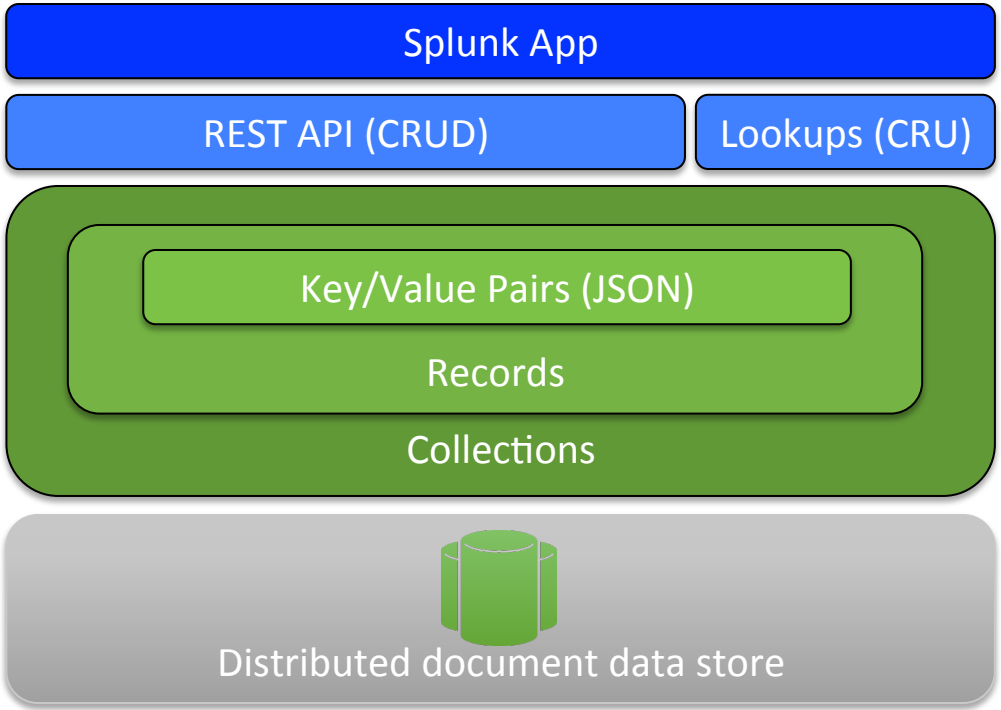
App KVStore Overview



- Schema support
- Data types can be enforced for fields (number, boolean, time, string)
- Support for field accelerations (index)

Concepts

- **Collections** are the containers for your data, similar to a database table. Collections exist within the context of a given app.
- **Records** contain each entry of your data, similar to a row in a database table.
- **Fields** correspond to key names, similar to the columns in a database table. Fields contain the values of your data. You can optionally enforce data types (number, boolean, time, and string) for field values.
- **_key** is a reserved field that contains the unique ID for each record. It can be user-provided or app auto-generated.
- **_user** is a reserved field that contains the user ID for each record. This field cannot be overridden.
- **Accelerations** improve search performance by making searches that contain accelerated fields return faster.

App KVStore Uses

- Tracking workflow, e.g. for an incident review system
- Controlling an App job queue
- Managing a UI session (saving user or app state)
- Storing user metadata
- Storing checkpoint data for modular inputs
- Caching results of splunk queries or from an external data store
- …and more

Example App - Demo

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Example App - Implementation

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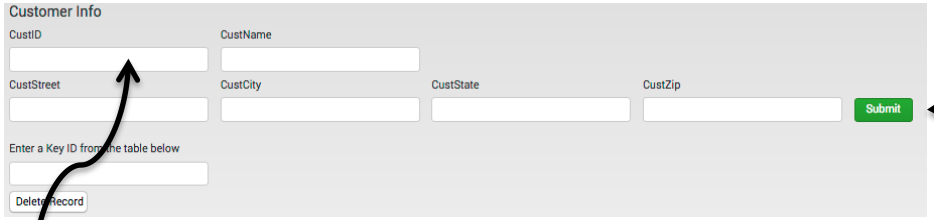
Demo implementation, Create Record




```
var input1 = new TextInput({
    "id": "input1",
    "value": "$form.CustID$",
    "el": $('#input1')
}, {tokens: true}).render();

input1.on("change", function(newValue) {
    FormUtils.handleValueChange(input1);
});
```

```
// Create a service object using the Splunk SDK for JavaScript
// to send REST requests
var service = mvc.createService({ owner: "nobody" });
```

```
var submit = new SubmitButton({
    id: 'submit',
    el: $('#search_btn')
}, {tokens: true}).render();

submit.on("submit", function() {
    submitTokens();

    // When the Submit button is clicked, get all the form fields by accessing token values
    var tokens = mvc.Components.getInstance("default");
    var form_id = tokens.get("CustID");
    var form_name = tokens.get("CustName");
    var form_street = tokens.get("CustStreet");
    var form_city = tokens.get("CustCity");
    var form_state = tokens.get("CustState");
    var form_zip = tokens.get("CustZip");

    // Create a dictionary to store the field names and values
    var record = {
        "CustID": form_id,
        "CustName": form_name,
        "CustStreet": form_street,
        "CustCity": form_city,
        "CustState": form_state,
        "CustZip": form_zip
    };

    // Use the request method to send a REST POST request
    // to the storage/collections/data/{collection}/ endpoint
    service.request(
        "storage/collections/data/mycollection/",
        "POST",
        null,
        null,
        JSON.stringify(record),
        {"Content-Type": "application/json"},
        null).done(function() {
                // Run the search again to update the table
                search1.startSearch();

                // Clear the form fields
                $("#formCustomerInfo input[type=text]").val("");
        });

});
```

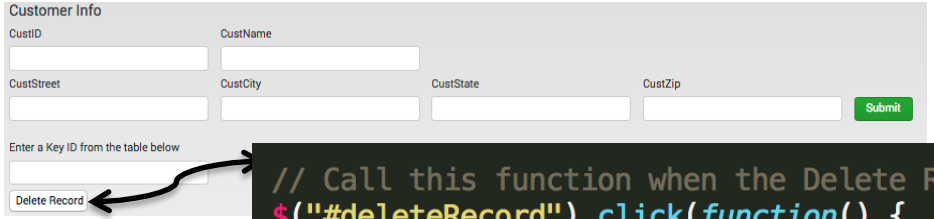
Create Record Details

```
// When the Submit button is clicked, get all the form fields by accessing token values
var tokens = mvc.Components.getInstance("default");
var form_id = tokens.get("CustID");
// GET OTHER FORM FIELDS

// Create a dictionary to store the field names and values
var record = {
    "CustID": form_id,
    "CustName": form_name,
    "CustStreet": form_street,
    "CustCity": form_city,
    "CustState": form_state,
    "CustZip": form_zip
};

// Use the request method to send a REST POST request
// to the storage/collections/data/{collection}/ endpoint
service.request( "storage/collections/data/mycollection/", "POST", null, null, JSON.stringify(record),
                {"Content-Type": "application/json"}, null
                ).done(function() {
                    // Run the search again to update the table
                    search1.startSearch();
                    // Clear the form fields
                    $("#formCustomerInfo input[type=text]").val("");
                });
```

Demo Implementation, Delete Record




```
// Call this function when the Delete Record button is clicked
$("#deleteRecord").click(function() {
    // Get the value of the key ID field
    var tokens = mvc.Components.getInstance("default");
    var form_keyid = tokens.get("KeyID");

    // Delete the record that corresponds to the key ID using
    // the del method to send a DELETE request
    // to the storage/collections/data/{collection}/ endpoint
    service.del("storage/collections/data/mycollection/" + encodeURIComponent(form_keyid))
        .done(function() {
            // Run the search again to update the table
            search1.startSearch();
        });
    return false;
});
```

Configuration & API

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KVStore Configuration

- Define your collection in `collections.conf`:
  `[mycollection]`
  Optionally, define schema/data types here (not used in demo app)

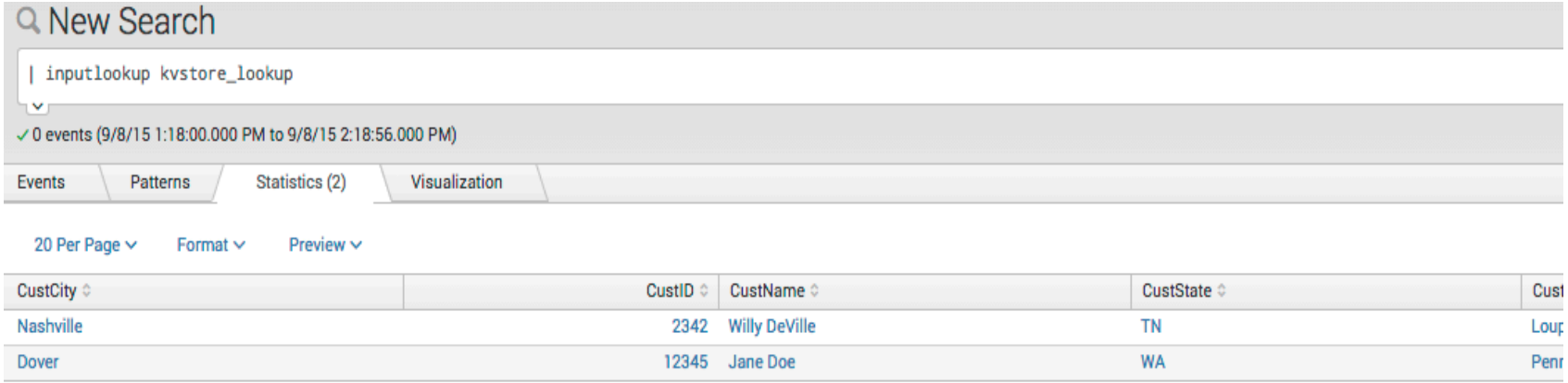
- Define a lookup to use it in `transforms.conf`:
  [kvstore_lookup]
  external_type = kvstore
  collection = mycollection
  fields_list = _key, CustID, CustName, CustStreet, CustState, CustCity, CustZip

KVStore REST Endpoints

- **storage/collections/config** – list all collections
- **storage/collections/config/{collection}** – CRUD collection
- **storage/collections/data/{collection}** – CRUD record(s)
- **storage/collections/data/{collection}/{key}** – CRUD record
- **storage/collections/data/{collection}/batch_save** – Bulk CU

Using SPL

Search: | `inputlookup <lookupname>`



Update: | `inputlookup kvstorecoll_lookup | search _key=544948df3ec32d7a4c1d9755 | eval CustName="Marge Simpson" | eval CustCity="Springfield" | outputlookup kvstorecoll_lookup append=True`

Using CURL

Command line input:

```
$ curl -k -u admin:passwd https://localhost:8089/servicesNS/nobody/
kvstoretutorial/storage/collections/data/mycollection
```

Output:

```
[ { "CustID" : "2342", "CustName" : "Willy DeVille", "CustStreet" : "Loup 29", "CustCity" : "Nashville",
"CustState" : "TN", "CustZip" : "12345", "_user" : "nobody", "_key" : "55c51fa657d58305865af4d1" } ]
```

Summary

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Summary

- Use it:
  - If you want to store and persist non-event data
  - If you need per-record inserts/updates
  - If you need multi-user access locking
  - If you need to enforce data types
- Don’t use it:
  - As a general replacement for lookup files
  - If you need automatic lookups (not supported today)
  - If you need distributed search-based lookups on the index tier (limited to SH today)

Other Example Uses

- Splunk for Enterprise Security
  - To enable the built-in workflow feature
  - To store notable events
- Splunk for IT Service Intelligence:
  - To store notable events
- Feeling creative already…?
  - Integrate a chat panel into your dashboard(s) for collaboration?
  - Tag/Flag events for later review?
  - ….

Looking Ahead

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What's New In 6.3 For App KV Store

- Two main KVStore improvements
  - Distributed lookups: Improved efficiency at scale
  - Lookup filtering: Filter lookup results without using a subsequent search command

You May Want To Review…

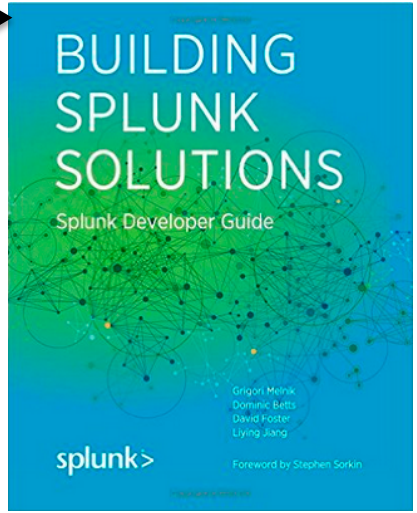
Related breakout sessions and activities…

- Matthew Modestino (TELUS), **Wednesday 10am - 10:45am**
  "Keep your Eyes on the KPIs! …"
  Using KVStore in an app used to do 24x7 NOC alerting integration

- Scott Haskell (Splunk), **Wednesday 11:15am – 12pm**
  "Modular Inputs – If You Build It, They Will Come"
  Using KVStore to keep checkpoint data in a modular input

Further Reading

- Splunk Developer Guidance
  http://dev.splunk.com/view/dev-guide/SP-CAAAE2X
- Splunk Reference App (PAS)
  https://splunkbase.splunk.com/app/1934/
- KVStore Lookups
  http://docs.splunk.com/Documentation/Splunk/latest/Knowledge/ConfigureKVstorelookups
- KVStore REST endpoints
  http://docs.splunk.com/Documentation/Splunk/latest/RESTREF/RESTkvstore
- Monitor the KVStore with the DMC
  http://docs.splunk.com/Documentation/Splunk/6.2.5/Admin/KVStoreInstance
- Splunk Developer Portal
  http://dev.splunk.com
- KVStore tutorial (demo app)
  http://dev.splunk.com/view/webframework-features/SP-CAAAEZT



Questions?

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THANK YOU

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