knowledge14®

April 27–May 1, 2014 • Moscone Center • San Francisco, CA

UI 301: Create Advanced Interfaces with Jelly

TYLER JONES
SENIOR UI DEVELOPER
ServiceNow

CHUCK TOMASI
SENIOR SOLUTION CONSULTANT
ServiceNow

servicenow®

© 2014 ServiceNow All Rights Reserved

Objectives

Understand two-phase rendering

Cover special tags

Build familiarity with escaping

Learn how to make large components

© 2014 ServiceNow All Rights Reserved

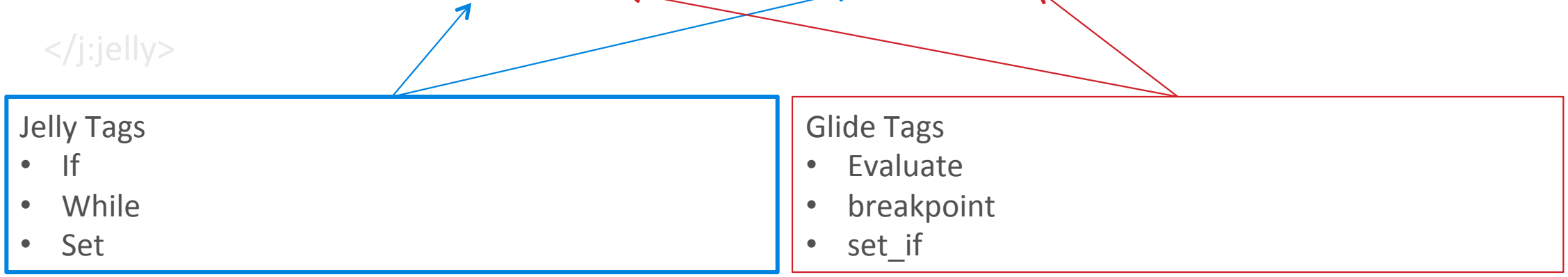
What does this tag mean?

```
<j:jelly trim="true" xmlns:j="jelly:core" xmlns:g="glide"
                                xmlns:j2="null” xmlns:g2="null”>
```

© 2014 ServiceNow All Rights Reserved

From the Ground Up

```
<?xml version="1.0" encoding="utf-8" ?>
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
</j:jelly>
```



© 2014 ServiceNow All Rights Reserved

Why g: and g:

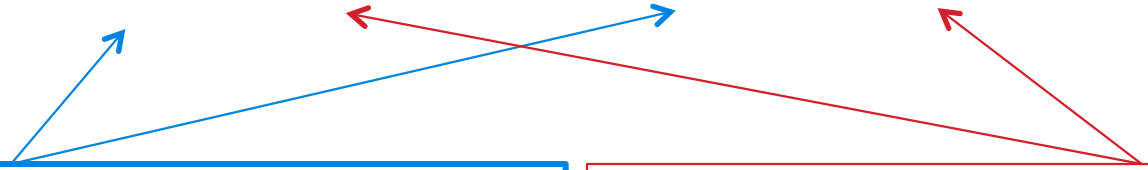
- j is for Jelly
  - Defined in CoreTagLibrary.java
- g is for Glide
  - Defined in GlideTagLibrary.java and added by plugins that you activate

There are other Jelly tag libraries that come with Jelly (e.g. XMLTagLibrary), but we don't use them

© 2014 ServiceNow All Rights Reserved

From the Ground Up

```
<?xml version="1.0" encoding="utf-8" ?>
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
</j:jelly>
```



Jelly Tags
- If
- While
- Set

Glide Tags
- Evaluate
- breakpoint
- set_if

© 2014 ServiceNow All Rights Reserved

Two Phase Encoding - Start

- Start with basic code snippet:

jelly_two_phase

```
<?xml version="1.0" encoding="utf-8" ?>
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
   <g:evaluate var="jvar_records" object="true">
      var records = new GlideRecord('incident');
      records.get(RP.getParameterValue('sysparm_sys_id'));
      records;
   </g:evaluate>
   <j2:if test="${jvar_records.isValidRecord()}">
      We found ${jvar_records.getValue('number')}
   </j2:if>
</j:jelly>
```

© 2014 ServiceNow All Rights Reserved

Two Phase Encoding – Phase 1

- Render all of the phase 1 content

```
3    <g:evaluate var="jvar_records" object="true">
4       var records = new GlideRecord('incident');
5       records.get(RP.getParameterValue('sysparm_sys_id'));
6       records;
7    </g:evaluate>
8    <j2:if test="${jvar_records.isValidRecord()}">
9       We found ${jvar_records.getValue('number')}
10   </j2:if>
```



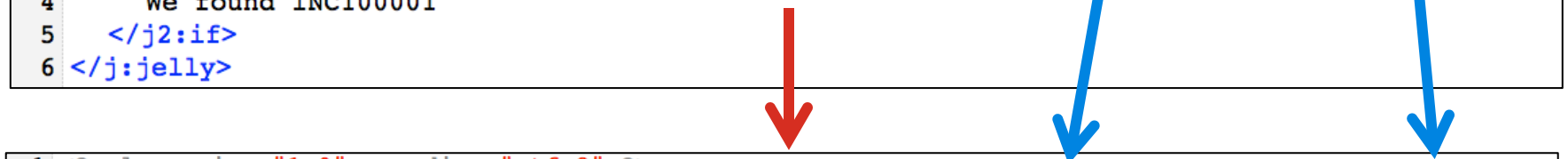
```
3    <j2:if test="true">
4       We found INC100001
5    </j2:if>
```

© 2014 ServiceNow All Rights Reserved

Two Phase Encoding – Phase 2

- Swap the jelly tag namespaces

```
1 <?xml version="1.0" encoding="utf-8" ?>
2 <j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
3   <j2:if test="true">
4     We found INC100001
5   </j2:if>
6 </j:jelly>
```



```
1 <?xml version="1.0" encoding="utf-8" ?>
2 <j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="jelly:core" xmlns:g2="glide">
3   <j2:if test="true">
4     We found INC100001
5   </j2:if>
6 </j:jelly>
```

- Render all of the phase 2 content

```
3   <j2:if test="true">
4     We found INC100001
5   </j2:if>
```



```
3     We found INC100001
```

© 2014 ServiceNow All Rights Reserved

Jelly Tags

© 2014 ServiceNow All Rights Reserved

Jelly Tags - <g:evaluate>

- Parameters
  - Var
  - Object
  - Jelly
  - expression

jelly_tag_evaluate

```
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
        <g:evaluate var="jvar_username">
                var user = gs.getUserName();
                if (user == 'guest')
                        user = 'Not logged in';

                user;
        </g:evaluate>
</j:jelly>
```

© 2014 ServiceNow All Rights Reserved

g:evaluate for auxiliary functions

jelly_evaluate_library

```
<g:evaluate>
   function hello_english(name) {
      return "Hello, " + name;
   }

   function hello_spanish(name) {
      return "Buenas tardes, " + name;
   }
</g:evaluate>
<p>
   English: ${hello_english('Francis')}
</p>
<p>
   Spanish: ${hello_spanish('Pancho')}
</p>
```

© 2014 ServiceNow All Rights Reserved

Jelly Tags - <j:if>

- Parameters
  - Test

jelly_tag_if

```
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
		<j:if test="${gs.isLoggedIn()}">
			You are logged in as user ${gs.getUserName()}
		</j:if>
		<j:if test="${!gs.isLoggedIn()}">
			You are not logged in!
		</j:if>
</j:jelly>
```

Exercise: Create a Jelly segment of code to output a message based on if they are an admin.

© 2014 ServiceNow All Rights Reserved

Jelly Tags - <j:set>

- Parameters
  - var
  - value

jelly_tag_set

```
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
        <j:set var="jvar_username" value="${gs.getUserName()}"/>
</j:jelly>
```

Exercise: Create a segment that sets a variable with the link of the current user's record

© 2014 ServiceNow All Rights Reserved

Jelly Tags – <g:set_if>

- Parameters
  - var
  - test
  - true
  - false

jelly_tag_set_if

```
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
        <g:set_if test="${gs.isLoggedIn()}"
                var="jvar_login_message"
                true="You are logged in as user ${gs.getUserName()}"
                false="You are not logged in!"/>

</j:jelly>
```

Exercise: Greet admins with the message “Welcome!” and others with a different message

© 2014 ServiceNow All Rights Reserved

Jelly Tags - <j:while>

- Parameters
  - Test

jelly_tag_while

```
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
        <g:evaluate var="jvar_records" object="true">
                var gr = new GlideRecord('incident');
                gr.addQuery('assigned_to', gs.getUserID());
                gr.get(RP.getParameterValue('sysparm_sys_id'));
                gr;
        </g:evaluate>
        <j:while test="${jvar_records.next()}">
                You own ticket ${jvar_records.getValue('number')}
        </j:while>

</j:jelly>
```

Exercise: Output a tree of incidents and their parent incidents

© 2014 ServiceNow All Rights Reserved

Jelly Tags - <g:breakpoint>

- Parameters
  - var

jelly_tag_breakpoint

```
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
        <g:breakpoint var="sysparm_parameter"/>
</j:jelly>
```

© 2014 ServiceNow All Rights Reserved

Jelly Tags - choose/when/otherwise

- Choose – the head tag
- When – Has a test
- Otherwise – The else/default condition

jelly_tag_choose_when_otherwise

```
<j:while test="${jvar_incidents.next()}">
   <j:choose>
      <j:when test="${jvar_incidents.getValue('priority') == 1}">
         <b>${jvar_incidents.getDisplayValue()} is a big deal!</b>
      </j:when>
      <j:otherwise>
         ${jvar_incidents.getDisplayValue()} is not important!
      </j:otherwise>
   </j:choose>
</j:while>
```

© 2014 ServiceNow All Rights Reserved

Organizing your code

© 2014 ServiceNow All Rights Reserved

How do you organize your code

- Create smaller, reusable pieces like fields and rows
- Organize those into UI Macros
- Invoke the UI Macros when needed

© 2014 ServiceNow All Rights Reserved

Macro invoke

- If you have a UI Macro named include_me_macro
- You can output it as either of the two

jelly_invoke_macro

```
<?xml version="1.0" encoding="utf-8" ?>
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
   <g:include_me_macro/>
</j:jelly>
```

jelly_invoke_macro_2

```
<?xml version="1.0" encoding="utf-8" ?>
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
   <g:macro_invoke macro="include_me_macro"/>
</j:jelly>
```

© 2014 ServiceNow All Rights Reserved

Including Macros

- Often times you want to include dynamic variables in macros

UI Macro: label_and_field

```
<?xml version="1.0" encoding="utf-8" ?>
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
    <label>${jvar_label}
        <input type="${jvar_type}" value="${jvar_value}"/>
    </label>
</j:jelly>
```

© 2014 ServiceNow All Rights Reserved

Including Macros

- Often times you want to include dynamic variables in macros

jelly_label_and_field_preset

```
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
    <j:set var="jvar_label" value="Test Field"/>
    <j:set var="jvar_type" value="text"/>
    <j:set var="jvar_value" value="Test Value"/>
    <g:label_and_field />
</j:jelly>
```

jelly_label_and_field_parameters

```
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
    <g:label_and_field label="Test Field" type="text" value="Test Value" />
</j:jelly>
```

© 2014 ServiceNow All Rights Reserved

Including Macros

- What if you didn't want to require each variable?

jelly_label_and_field_unspecified

```
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
   <g:label_and_field_with_defaults label="Test Field"/>
</j:jelly>
```

UI Macro: label_and_field_with_defaults

```
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
   <g:macro type="text" value="Fake Value"/>
   <label>${jvar_label}
      <input type="${jvar_type}" value="${jvar_value}"/>
   </label>
</j:jelly>
```

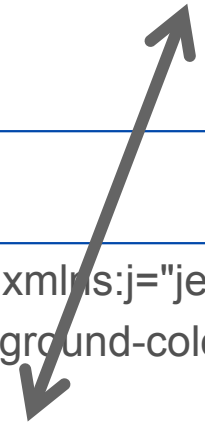
© 2014 ServiceNow All Rights Reserved

Insert Tag

Inner content is output using <g:insert/>

jelly_tag_insert

```
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
    <g:blue_div>
        Message in a blue div
    </g:blue_div>
</j:jelly>
```



UI Macro: blue_div

```
<j:jelly trim="false" xmlns:j="jelly:core" xmlns:g="glide" xmlns:j2="null" xmlns:g2="null">
    <div style="background-color:blue; color:white; padding: 20px;">
        <g:insert/>
    </div>
</j:jelly>
```

© 2014 ServiceNow All Rights Reserved

Security and Escaping

© 2014 ServiceNow All Rights Reserved

Escaping - HTML

escaping_html

```
<p>
   Hello ${sysparm_name}, and welcome to the site!
</p>
```

Try the following URLs:

/escaping_html.do?sysparm_name=Lord Voldemort
/escaping_html.do?sysparm_name=alert(document.cookie)
/escaping_html.do
?sysparm_name=$[AMP]lt;script>alert(document.cookie);$[AMP]lt;/script>

Note: this is only done if `glide.ui.escape_text` is false.

© 2014 ServiceNow All Rights Reserved

Escaping - HTML

Solution:

```
<p>
   Hello ${HTML:sysparm_name}, and welcome to the site!
</p>
```

Before	After
&	&
<	<
>	>

Note: this is only done if `glide.ui.escape_text` is false.

© 2014 ServiceNow All Rights Reserved

Escaping - JS

escaping_js

```
<span>
   Hello, <span id="the_name_container"></span>!
</span>
<script type="text/javascript">
   $('the_name_container').innerHTML = '${sysparm_name}';
</script>
```

Try the following URLs:

/escaping_js.do?sysparm_name=Fred Luddy
/escaping_js.do?sysparm_name=‘;alert(document.cookie);’

© 2014 ServiceNow All Rights Reserved

Escaping - JS

Solution:

```
<span>
   Hello, <span id="the_name_container"></span>!
</span>
<script type="text/javascript">
   $('the_name_container').innerHTML = '${JS:sysparm_name}';
</script>
```

Before	After
‘	\’
“	\”
CR	blank
NL	\n (the string “\n”)

Before	After
<script…>	<script…>
</script>	</script…>
If phase 1	
&	&
<	\\u003C

© 2014 ServiceNow All Rights Reserved

Escaping – g:no_escape

What about when we trust the source and want to output HTML/JS?

escaping_no_escape

```
<g:evaluate var="jvar_kb_article">
    var gr = new GlideRecord('kb_knowledge');
    gr.get('number', 'KB0000012');
    gr;
</g:evaluate>
${gr.text}
```

Solution:

```
<g:evaluate var="jvar_kb_article">
    var gr = new GlideRecord('kb_knowledge');
    gr.get('number', 'KB0000012');
    gr;
</g:evaluate>
<g:no_escape>${gr.text}</g:no_escape>
```

© 2014 ServiceNow All Rights Reserved

Client-side JS in Jelly

- It's still just HTML and JS, so you can include <script> tags in your templates
- Really nothing to fear, except some character escaping

© 2014 ServiceNow All Rights Reserved

Client-side JS in your Jelly (FizzBuzz edition)

jelly_client_side

```
Result:
   <span id="script_result"></span>
   <script type="text/javascript">
      var result = "";

      for (var i = 1; i <= 100; i++) {
         if (i % 3 == 0)
            result += 'Fizz';

         if (i % 5 == 0)
            result += 'Buzz';

         if (i % 3 != 0 && i % 5 != 0)
            result += i;

         result += '<br/>';
      }

      $('script_result').innerHTML = result;
   </script>
```

© 2014 ServiceNow All Rights Reserved

Client-side JS in your Jelly (FizzBuzz edition)

```
Result:
    <span id="script_result"></span>
    <script type="text/javascript">
        var result = "";

        for (var i = 1; i <= 100; i++) {
            if (i % 3 == 0)
                result += 'Fizz';

            if (i % 5 == 0)
                result += 'Buzz';

            if (i % 3 != 0 && i % 5 != 0)
                result += i;

            result += '<br/>';
        }

        $('script_result').innerHTML = result;
    </script>
```

© 2014 ServiceNow All Rights Reserved

Client-side JS in your Jelly (FizzBuzz edition)

jelly_escaping_client_side

```
Result:
   <span id="script_result"></span>
   <script type="text/javascript">
      var result = "";

      for (var i = 1; i != 101; i++) {
         if (i % 3 == 0)
            result += 'Fizz';

         if (i % 5 == 0)
            result += 'Buzz';

         if (i % 3 != 0 $[AND] i % 5 != 0)
            result += i;

         result += '<br/>';
      }

      $('script_result').innerHTML = result;
   </script>
```

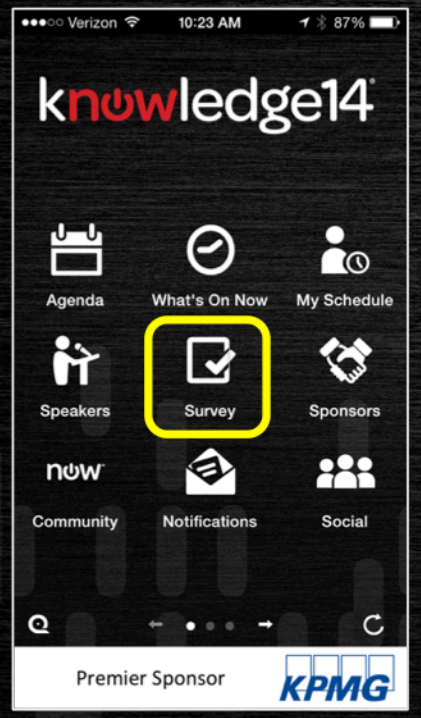
© 2014 ServiceNow All Rights Reserved

If we still have time

- UI Formatters
  - Look at the existing ones, and you can make your own easily
- UI Page processing scripts
  - Use the g:ui_form, and those parameters will be available in script
- CMS Dynamic Blocks
  - Just know where to query!

© 2014 ServiceNow All Rights Reserved

Tell us what you think!



Click on the survey link in your Knowledge14 mobile app. Help us make Knowledge 15 even more valuable!

Thank You

Tyler Jones

Senior UI Developer

ServiceNow

tyler.jones@servicenow.com

Chuck Tomasi

Senior Solution Consultant

ServiceNow

chuck.tomasi@servicenow.com

Want a copy of this deck?

Sign into the BuzzHub to unlock all the slides and lab guides from Knowledge14 sessions

