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BPM Monitoring Solutions Best Practices



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Chapter 1: Overview

This document contains case studies (Chapters 3-5) which provide explanations to customers of how to monitor their own paid-for-service cloud applications.

The goal of these case studies is to show how to establish end user monitoring on cloud applications using TruClient for Internet Explorer protocol. These case studies provide the basic instructions required to facilitate building end user monitoring solutions using WYSIWYG protocol.

We recommend that you review Chapter 6 which describes how to use scripts to proactively monitor your cloud service provider.

Where applicable, the case studies are built around monitoring web applications. You can use TruClient for IE or Mobile protocol, depending on your business needs.

Chapter 2: How to Use Script Parameters and Functions

Script Parameters

Generally, parameters are used when values change frequently or you want to easily change them. Instead of changing the content of the script, you can just change the parameters. Script parameters defined in VuGen are seen in End User Management Administration in BSM.

fice365s Paran	nete	rs		
Name	÷	Value	Sensitive	
passwd		•••••	×	
userName			-	
userNameSurna	ame		-	
3 /2		Close	Help	
672		Close	Licip	

Script Parameters

To achieve this, create the parameters in VuGen. Notice that the value for the *passwd* parameter is marked as sensitive. Let us show you how we did this.

All parameters except *passwd* are plain text:

- **passwd** Hidden and encrypted password.
- userName Username in the form of an email address (user@domain.com).
- **userNameSurname** This parameter is created because in some steps we need to click the full name of the user.

Parameter List	?
→ D> passwd → O> userName	Parameter type: Table
L.≺D> userNameSurname	File path: passwd[2] dat Image: Constraint of the second
	passwd 1 52360/52084d5103d7592871
	Edit with Notepad
	Columns: Rows: Rows: Rows: Columns by number: Columns by number: Tourns the information Table information
	Rows delimeter for log display: When not enough rows : Use behavior of "Select Next Row"
	Select next row: Sequential
	When out of values Continue with last value
New Delete	Automatically allocate block size Allocate values for each Vuser
	Close

Password Parameter is Encrypted

To encrypt the password, we first need to use the Password Encoder:

	Control Panel	Password Encoder 🛛 🗙
📙 HP OVCM Agent		
\mu HP Software	Administrative Tools	Password: test
HP LoadRunner		
🛓 Readme	Help and Support	Encoded String: 5272b15079ea502c
殻 Virtual User Generator		
Documentation	Run	Enter the password and click 'Generate' to display
🚡 Samples 📃		the encoded string.
🛺 Tools	Windows Security	:
Password Encoder		Generate Copy Close Help
👴 Protocol Advisor		

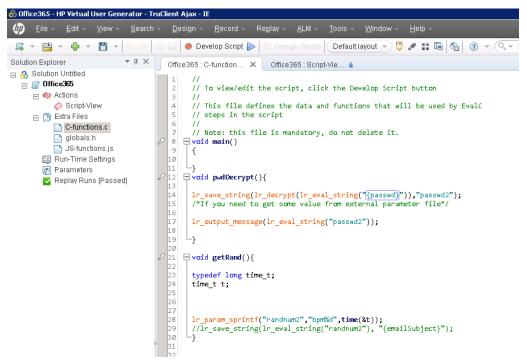
Password Encoder

The encoded string is then copied to the *passwd* value.

Script Functions

Functions are used to enhance a script. We use functions to achieve the following goals:

- Decrypt the parameter value and put it in a new parameter that is visible only within the script instance running on VuGen or the BPM instance.
- Generate a random number that is unique. In this example, we use Time as the random number.



Content of C-function.c File

To decrypt this code, we use a C function within the script. Functions are stored in the C-function.c file.

```
void pwdDecrypt(){
lr_save_string(lr_decrypt(lr_eval_string("{passwd}")), "passwd2");
}
```

The function *Ir_eval_string* converts the *passwd* parameter to a string. Then *Ir_decrypt* decrypts the string and *Ir_save_string* copies the string as plain text to *passwd2*. This plain text password is contained within the boundaries of the script instance that is executed on the BPM instance.

Another function used is *getRand()*. It generates a unique Subject text that we can locate later and delete:

```
void getRand() {
typedef long time_t;
time_t t;
lr_param_sprintf("randnum2","bpm%d",time(&t));
}
```

These functions are used within the script.

Chapter 3: Cloud Email Provider – Office 365 Transaction Flow

This case study uses Microsoft Office 365 cloud service. The case study uses one flow/script with the following transactions:

- 1. Login Open a login page, enter your credentials, and confirm that the first page loads.
- Create an email Create a new email and send it with a unique subject to the logged in user.
- 3. Delete the email Check for this unique email, select it, and delete it.
- 4. Calendar Click the Calendar link and verify that the calendar loads.
- 5. Logoff Log off from the web application.

The main purpose of running this script is to confirm that the application's processes run successfully. If successful, the transactions complete without any errors.

You can view a sample Office365 script by downloading the following file: <u>http://support.openview.hp.com/selfsolve/document/KM00658288/binary/BPM_Monitoring_S</u> <u>olutions-Office365.zip</u>.

General Flow

Microsoft Office 365 is a subscription-based online office and software plus services suite which offers access to various services and software built around the Microsoft Office platform. In this flow, we test Microsoft Office 365's email and calendar functionality.

A sequence of transactions creates the business process flow. A transaction is a unit that is measurable by availability and performance. Therefore, we group activities that perform a specific transaction.

To describe and validate these transactions, logically group the transactions into the following steps:

- 1. Login.
 - a. Navigate to https://portal.microsoftonline.com.
 - b. Enter your credentials and confirm that the first page (Inbox) loads.
- 2. Create a new email.
 - a. Click New Mail.
 - b. Enter the email address used to login in step 1.
 - c. Enter a unique subject.
 - d. Send the email.
- 3. Delete the email.
 - a. Refresh and check if the email arrived.
 - b. Select the email.
 - c. Delete the email.

4. Calendar

- a. Click the **Calendar** button and confirm that the Calendar page loads.
- 5. Logoff
 - a. Log off from the web application

The following sections describe how to create these transactions.

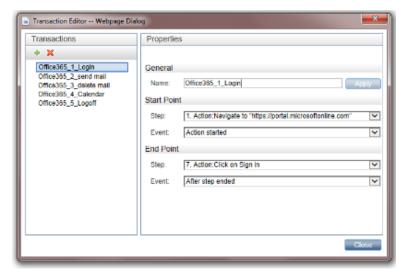
A good approach, before using this tool, is to know what we want to achieve. Create a blueprint as follows:

- 1. Run the Office 365 web application in Internet Explorer 9. Perform the steps of the flow and create annotations.
- 2. Determine the boundaries that form the transactions.
- 3. Select which values to assign to the parameters.
- 4. Select what values to protect and encrypt.

Record all the information you collect since it will come in handy later.

We recommend you start using the script. Refer to sections in this document for assistance.

Transaction — Office365_1_Login

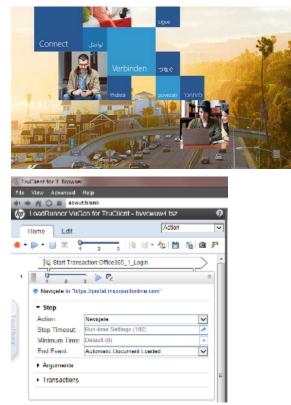


Define the name of the transaction. In this example, we call this transaction "Office365_1_Login". Naming conventions should provide a clear view of the application, the transaction order, and create an overview of the business processes covered by this transaction.

Define the steps and events for the starting and ending points of the transaction. The most appropriate event for the start step is **Action started**. The most appropriate event for the end step is **After step ended**.

This transaction contains all the steps required for logging into the Office 365 application.

Navigate to https://portal.microsoftonline.com



	Sign	in	with	your	organizational	account	
--	------	----	------	------	----------------	---------	--

someone@example.com	
Password	
Keep me signed in	



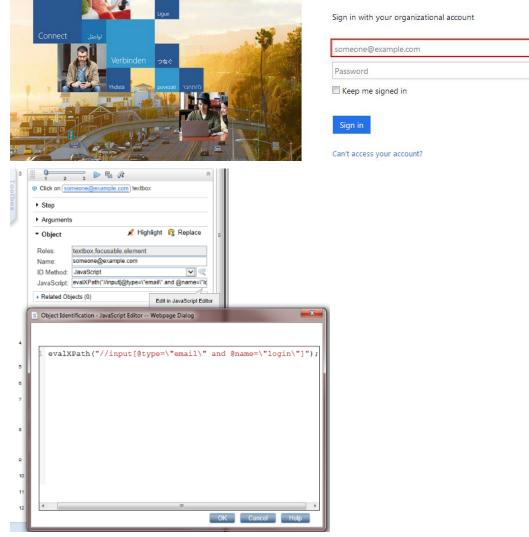
Can't access your account?

In the Navigation step, specify the URL.

While recording, VuGen automatically selects the appropriate End Event, in this case **Document downloaded**. The step ends when the process of loading a document completes. In most cases, you can freely select the default values.

If the pages load slowly, you can use a Wait step to make sure the page loads. For information on Wait steps, see *Meaning of Wait Step* on page 89.

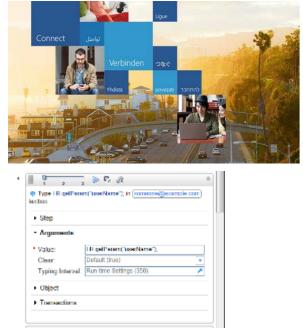
Click in the someone@example.com Textbox



You can either select the **Automatic** or **JavaScript** ID method.

For the JavaScript ID Method, enter the following in the JavaScript field: evalXPath("//input[@type=\"email\" and @name=\"login\"]"); There are cases when you will change the ID Method, as we will see later.

Type LR.getParam('userName') in someone@example.com Textbox



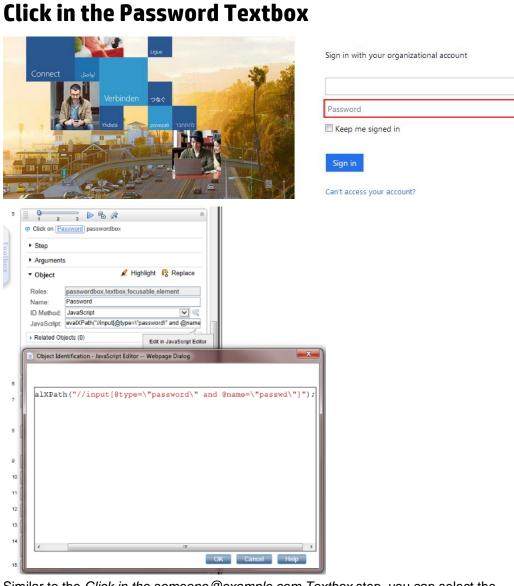
Sign in with your organizational account

someone@example.com
Password
Keep me signed in

Can't access your account?

Type the username in the **someone@example.com** textbox.

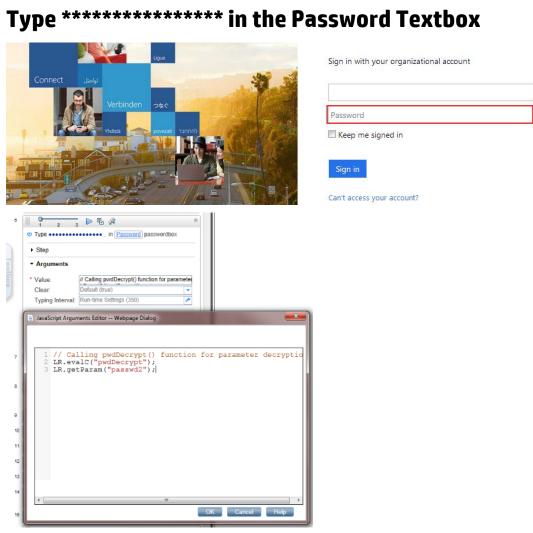
Since we are using parameters, you can enter the *LR.getParam('userName');* command in the **Value** field and the result is the defined username.



Similar to the *Click in the someone* @example.com Textbox step, you can select the **Automatic** or **JavaScript** ID method.

For the JavaScript ID Method, enter the following in the JavaScript field:

evalXPath("//input[@type=\"password\" and @name=\"passwd\"]");



Type a password in the **Password** textbox. To display an encrypted password, type the following:

```
// Calling pwdDecrypt() function for parameter decryption
```

```
LR.evalC("pwdDecrypt");
```

```
// This is a parameter with a decrypted value
```

```
LR.getParam("passwd2");
```

The pwdDecrypt() function is defined in C-function.c file:

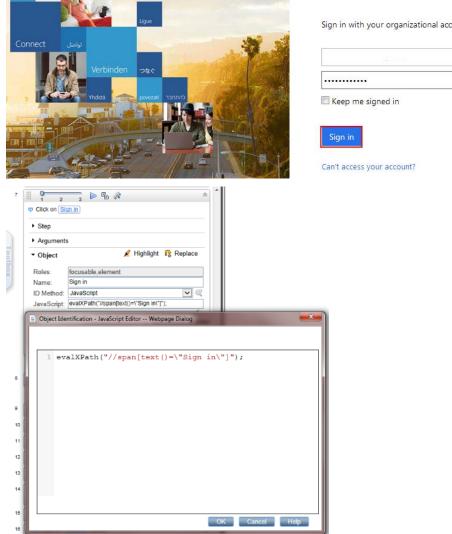
```
void pwdDecrypt() {
```

```
lr_save_string(lr_decrypt(lr_eval_string("{passwd}")), "passwd2");
/*If you need to get some value from external parameter file*/
lr_output_message(lr_eval_string("passwd2"));
}
```

passwd is the parameter defined for external use (BSM – EUM) and is encrypted.

passwd2 is the parameter seen only within this script instance.

Click Sign in



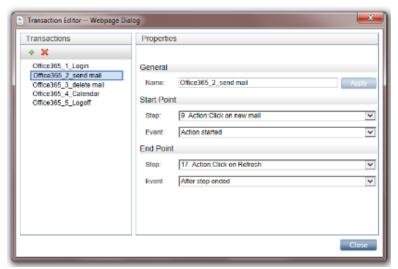
This is defined as the End step for Transaction Office365_1_Login.

The JavaScript ID Method used is:

evalXPath("//span[text()=\"Sign in\"]");

The End Event Step is set to automatic. So in this case, the End Event Step is Step Synchronous network completed. The step ends when all HTTP requests have completed excluding requests initiated by XMLHttpRequest.

Transaction — Office365_2_send mail



The name of this transaction is "Office365_2_send mail".

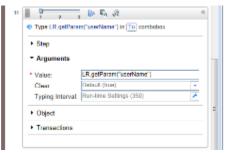
This transaction contains all the steps necessary for sending an email to the logged in user with a unique subject field.

Click New Mail

 Step 	
• Argumen	ts
• Object	💉 Highlight 🛛 🛱 Replec
Roles:	element
Name	new mail
ID Method	Automatic (recommended)
the second second	

When you click **New Mail**, a form appears for sending a new email. By running the script multiple times, we can confirm that this element is recognized using the Automatic ID method.

Type LR.getParam('userName') in To Field



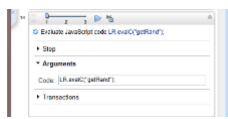
To make this script robust, we use parameters. If the username or password is changed at a later time, you do not need to change the script, only the parameter's value. The username is in the form of an email address.

Click in Subject Field

 Step 	
Argument	9
* Object S	ep Eritor 👔 🛛 🔏 Highlight 🔅 Replace
Roles:	textbox,focusable,element
Name:	Subject
D Method:	Automatic (recommended)
 Related Ob 	jeds (0)

Click in the Subject field to select it.

Evaluate JavaScript Code LR.evalC('getRand');

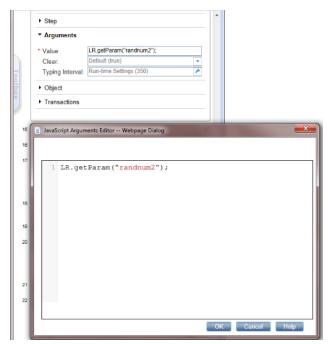


This is a very important step. By calling this function, we create a Subject value.

The getRand() function is defined in the C-function.c file:

```
void getRand() {
typedef long time_t;
time_t t;
lr_param_sprintf("randnum2","bpm%d",time(&t));
}
```

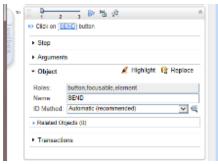
Type //LR.evalC('getRand'); L...am('randnum2'); in Subject Field



In this step, we acquire the value from the parameter:

```
LR.getParam("randnum2");
```

Click Send



Click **Send**. The Send button is easy to recognize so there was no need for any additional corrections.

Click Settings

 Step 	
+ Argument	9
• Object	🔏 Highlight 🚯 Replace
Roles	button, focusable, element
Name:	Settings
ID Method:	Automatic (recommended)

Click Settings to refresh the Inbox and check whether the email arrived.

Click Refresh

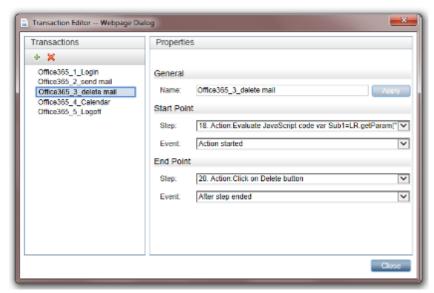
 Step 	
Argument	5
 Object 	🔏 Highlight 🛛 🛱 Replec
Holes:	clement
Name	Refresh
ID Method:	JavaScript
JavaScript:	evalXPath("//span()exb)=/"Refresh(")");
 Related Ob 	

After clicking **Refresh**, the transaction completes and we confirm that the email arrived. If the email still has not arrived, repeat the previous step (**Click Settings**) and this step (**Click Refresh**).

We use the JavaScript ID Method:

```
evalXPath("//span[text()=\"Refresh\"]");
```

Transaction — Office365_3_delete mail



The name of this transaction is "Office365_3_delete mail".

This transaction contains all the steps necessary for checking and deleting an email that was sent in the current interaction.

Evaluate JavaScript code var Sub1=LR.getParam('randnum2');

1 2	3 🕨 🖾	
Evaluate JavaSc	ript code var Sub1=LR.getParam("ra	andnum2"
 Step 		
 Arguments 		
Code: var Sub1	=LR.getParam("randnum2");	JS
Transactions	var Sub1=LR.getParam ("randnum2"):	

Create the Sub1 variable and get its value from the parameter randum2:

var Sub1=LR.getParam("randnum2");

This variable is used to check (identify) and delete a specific email sent within this interaction. The life span of this variable is within the page. When you change the page, you must re-evaluate this JavaScript if you need a value from the *randum2* parameter.

	south wall and people	م	bpm1303137977	
	al unread to me face			€ NKY - € 047 X. →
	1004	CORVERSATIONS BY DATE IN		
inbax 35	+ tpm1901001000	14.44	West 42/10/011/01/20 Distance/Sect:Device	
Sentitiens		X P	Tex 📕	
Drafts [6]	1	14.02		
Soeder Profulped				
Intex 36 Dishs (8)	•	12.45		
Sent form:				
Deleted terms 2521	Þ	12:59		
Junicismus Notes		2.4		
	•			
		11.0		
		10.08		
		2/14		
		Tec 21:25		
	•	Tac 21/3		
		Tar-19-14		
		Tak food		
4085		Tee (SHE		
Step Argument		Highlight 🔒 Replac	e	
Object Roles: Name:	button,element ArgsContext.Sub1			
Roles: Name: ID Method:	button,element ArgsContext.Sub1 JavaScript			
Roles: Name: ID Method: JavaScript:	button,element ArgsContext Sub1 JavaScript evalXPath("//span[text()			
Roles: Name: ID Method:	button,element ArgsContext Sub1 JavaScript evalXPath("//span[text()		<u>[</u> []	
Roles: Name: ID Method: JavaScript: Related O	button,element ArgsContext Sub1 JavaScript evalXPath("//span[text()	=\""+ArgsContext.Sub1+		
Roles: Name: ID Method: JavaScript: Related O	button,element ArgsContext.Sub1 JavaScript evalXPath("/span[text(): bjects (0)	=\""+ArgsContext.Sub1+	<u>[</u> []	
Roles: Name: ID Method: JavaScript: Related O	button,element ArgsContext.Sub1 JavaScript evalXPath("/span[text(): bjects (0)	=\""+ArgsContext.Sub1+	<u>[</u> []	
Roles: Name: ID Method: JavaScript: Related O	button, element ArgsContext Sub1 JavaScript evalXPath(//spantext() bjects (0) entification - JavaScript Ed	=\""+ArgsContext.Sub1+ itor Webpage Dialog	TT	
Roles: Name: ID Method: JavaScript Related O	button, element ArgsContext Sub1 JavaScript evalXPath(//spantext() bjects (0) entification - JavaScript Ed	=\""+ArgsContext.Sub1+ itor Webpage Dialog	<u>[</u> []	
Roles: Name: ID Method: JavaScript Related O	button, element ArgsContext Sub1 JavaScript evalXPath(//spantext() bjects (0) entification - JavaScript Ed	=\""+ArgsContext.Sub1+ itor Webpage Dialog	TT	
Roles: Name: ID Method: JavaScript Related O Diget Idd	button, element ArgsContext Sub1 JavaScript evalXPath(//spantext() bjects (0) entification - JavaScript Ed	=\""+ArgsContext.Sub1+ itor Webpage Dialog	TT	
Roles: Name: ID Method: JavaScript Related O	button, element ArgsContext Sub1 JavaScript evalXPath(//spantext() bjects (0) entification - JavaScript Ed	=\""+ArgsContext.Sub1+ itor Webpage Dialog	TT	
Roles: Name: ID Method: JavaScript Related O Diget Idd	button, element ArgsContext Sub1 JavaScript evalXPath(//spantext() bjects (0) entification - JavaScript Ed	=\""+ArgsContext.Sub1+ itor Webpage Dialog	TT	
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Roles: Name: ID Method: JavaScript Related O Diget Idd	button, element ArgsContext Sub1 JavaScript evalXPath(//spantext() bjects (0) entification - JavaScript Ed	=\""+ArgsContext.Sub1+ itor Webpage Dialog	TT	
Roles: Name: ID Method: JavaScript Related O Diget Idd	button, element ArgsContext Sub1 JavaScript evalXPath(//spantext() bjects (0) entification - JavaScript Ed	=\""+ArgsContext.Sub1+ itor Webpage Dialog	TT	
Roles: Name: ID Method: JavaScript • Related O = Object Idd	button, element ArgsContext Sub1 JavaScript evalXPath(//spantext() bjects (0) entification - JavaScript Ed	=\""+ArgsContext.Sub1+ itor Webpage Dialog	TT	
Roles: Name: ID Method: JavaScript Related O Doject Idd 20 1 ev 21 22 23	button, element ArgsContext Sub1 JavaScript evalXPath(//spantext() bjects (0) entification - JavaScript Ed	=\""+ArgsContext.Sub1+ itor Webpage Dialog	TT	
Roles: Name: ID Method: JavaScript • Related O © Object Idd	button, element ArgsContext Sub1 JavaScript evalXPath(//spantext() bjects (0) entification - JavaScript Ed	=\""+ArgsContext.Sub1+ itor Webpage Dialog	TT	
Roles: Name: ID Method: JavaScript Related O Doject Idd 20 1 ev 21 22 23	button, element ArgsContext Sub1 JavaScript evalXPath(//spantext() bjects (0) entification - JavaScript Ed	=\""+ArgsContext.Sub1+ itor Webpage Dialog	TT	

To identify an object, the name must be set as ArgsContext.Sub1

The ID Method is JavaScript:

evalXPath("//span[text()=\""+ArgsContext.Sub1+"\"]");

The specific email is found.

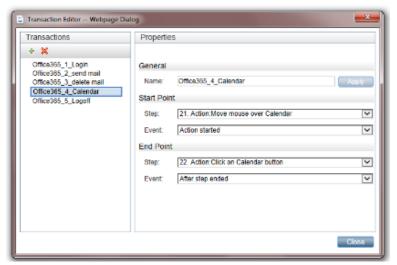
Click Delete

⊕ new mail	soarch wall and people	م	bpm1080139953		,
	al unread to me face	ped		ENRY BOA	л. ⇒номио —
	MBOA	CONVERSATIONS BY DATE IN	100 M		mark as read
a havanta	v	×	Web 025(523-17-0)		
inbox 35	 Igen198319938 Mo providvits ono listric. 	96.0	tolog Set Deck		
Sensitizens.			Tes 💻		
Drafts [6]	÷	14.08			
4 Socider Profulped					
Inface 36		1245			
Data (8)					
Sent Items		12.58			
Odded Items 2571	,	4.0			
Junic broad					
Neles	- F	12.54			
		20.48			
		50.08			
	,	50.00			
	*	2/H			
		Tec 21:55			
		Ta: 2115			
		Tar-19-04			
		Lat 1994			
14585		Tee 15/19			
11010	P	10012010			
	2 1 P 12 1		*		
🙂 Click on 🕽	Delete button				
 Step 					
► Argumer	nts.				
- Object		l Highlight 🥀 Repla	59		
Roles:	button, focusable, elen	nem			
Name	Delete				
ID Method	i: Automatic (recommen	ded) 🗸 🗸	**		
 Related 0 	Objects (0)				
 Transact 	tions				

The **Delete** button is easy to recognize.

This step completes Office365_3_delete mail.

Transaction — Office365_4_Calendar



The name of this transaction is "Office365_4_Calendar".

This transaction contains the steps necessary for confirming that the calendar loads.

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Inisos 25 Coda; [9] Sautheus Didded Herrs 2022 Amitemal			
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Deleted lines 2642	12.94		
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	1148		
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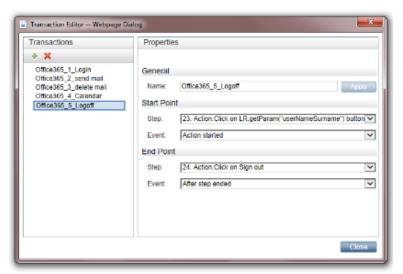
This section displays how to create an extra step (mouse over) before clicking an element.

Click Calendar

 Step 	
Argument	5
* Object	💉 Highlight 🛛 😵 Replace
Roles:	button, focusable, element
Name:	Calendar
ID Method:	Automatic (recommended)
Related Ot	sjects (0)

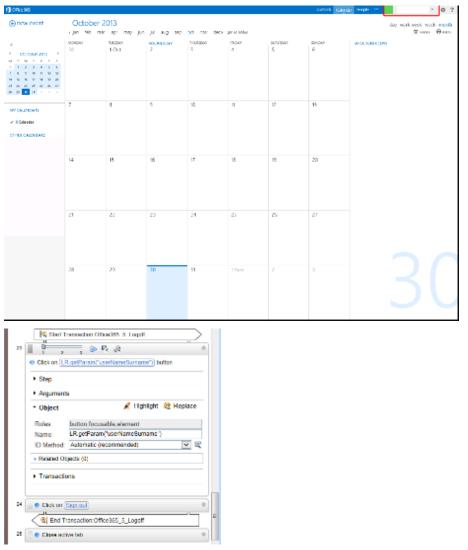
This is the end of transaction "Office365_4_Calendar.

Transaction — Office365_5_Logoff



The name of this transaction is "Office365_5_Logoff".

This transaction contains all the steps necessary for logging off.



Click LR.getParam('userNameSurname')

We used another parameter because for logging out of this application you must first click the full user name stored in the parameter *userNameSurname*.

LR.getParam("userNameSurname")

Click Sign out

	October 2								men
		r apr may jun	in and seb						Bre ₽
C COLORNATION P N T W T P T P N T W T P T C N T S T P T C N T S T P T C T N T S T P T C T N T S T P T C T N T S T P T T T T N T S T <td< td=""><td>MONDAY 30</td><td>10a</td><td>WEDRESONY 2</td><td>THURSDAY 3</td><td>1 4</td><td>SATURDAY S</td><td>50ND 6</td><td>Change C South Johnson Royal Li Chang Portu Li Change Portu Li Change Portu</td><td></td></td<>	MONDAY 30	10a	WEDRESONY 2	THURSDAY 3	1 4	SATURDAY S	50ND 6	Change C South Johnson Royal Li Chang Portu Li Change Portu	
MY CALENDARS	7	8	9	10	11	12	13	Openanether mailtons	
✓ ■Colendar								Sign out	
OTHER CALENDAVE									
	14	15	16	17	18	19	20		
	21	22	23	24	25	25	27		
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By clicking **Sign out**, we end this transaction and script.

All we need to do now is close the active tab.

Chapter 4: Cloud Email Provider – Gmail Transaction Flow

This case study uses Gmail cloud service. The case study uses one flow/script with the following transactions:

- 1. Login Open a login page, enter your credentials, and confirm that the first page loads.
- Create mail Create a new email, and send it with a unique subject to the logged in user.
- 3. Delete mail Check for this unique email, select it, and delete it.
- 4. Logoff Log off from the web application.

The main purpose of running this script is to confirm that the application's processes run successfully. If successful, the transactions complete without any errors.

You can view a sample Gmail script by downloading the following file: <u>http://support.openview.hp.com/selfsolve/document/KM00658288/binary/BPM_Monitoring_S</u> <u>olutions-Google_Mail.zip</u>

General Flow

Google Mail is another name for Google's email tool, Gmail. Gmail is a free, full-featured email service. Anyone can register for an account. Gmail is also available as part of Google Apps. In this flow, we test the email functionality of Gmail.

A sequence of transactions creates the business process flow. A transaction is a unit that is measurable by availability and performance. Therefore, we group activities that perform a specific transaction.

To describe and validate these transactions, logically group the transactions into the following steps:

- 1. Login.
 - a. Navigate to <u>https://gmail.com</u>.
 - b. Enter your credentials and confirm that the first page (Inbox) loads.
- 2. Create a new email.
 - a. Click Compose.
 - b. Enter the email address used to login in step 1.
 - c. Enter a unique subject.
 - d. Send the email.
- 3. Delete the email.
 - a. Refresh and check if the email arrived.
 - b. Select the email.
 - c. Delete the email.
- 4. Logoff

a. Log off from the web application

The following sections describe how to create these transactions.

A good approach, before using this tool, is to know what we want to achieve. Create a blueprint as follows:

- 1. Run the Gmail web application in Internet Explorer 9. Perform the steps of the flow and create annotations.
- 2. Determine the boundaries that form the transactions.
- 3. Select which values to assign to the parameters.
- 4. Select what values to protect and encrypt.

Record all the information you collect since it will come in handy later.

We recommend you start using the script. Refer to sections in this document for assistance.

Transaction — Gmail_1_Login

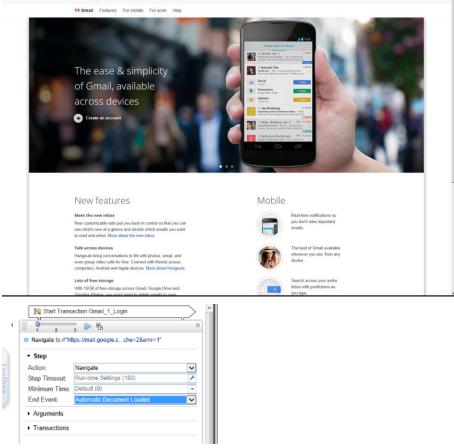
Transaction Editor Webpage Dialo	ng 📃 🔀
Transactions	Properties
K Gmail_1_Login Gmail_2_Send_mail Gmail_3_Delete Gmail_4_Logoff	General Name: Gmail_1_Login Apply Start Point Step: 1. Action:Navigate to //*https://mail.google.cche=2&emr=1" Event: Action started
	End Point Step: 4. Action:Wait 5 seconds Event: After step ended Close

Define the name of the transaction. In this example, we call the transaction "Gmail_1_Login". Naming conventions should provide a clear view of the application, the transaction order, and create an overview of the business processes covered by this transaction.

Define the steps and events for the starting and ending points of the transaction. The most appropriate event for the start step is **Action started**. The most appropriate event for the end step is **After step ended**.

This transaction contains all the steps required for logging into the Gmail application.

Navigate to https://mail.google.c...che=2&emr=1



In the Navigation step, specify the URL.

While recording, VuGen automatically selects the appropriate End Event, in this case **Document downloaded**. The step ends when the process of loading a document completes. In most cases, you can freely select the default values.

If the pages load slowly, you can use a Wait step to make sure the page loads. For information on Wait steps, see *Meaning of Wait Step* on page 89.

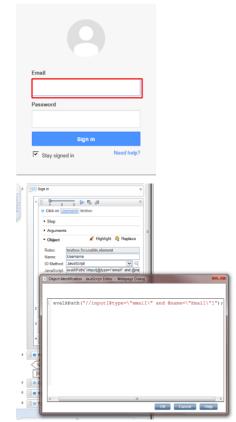
Click Sign in

 Click on Step 	Set step as optional. Step will be skipped during replay if step object is not found.	
 Argument 	S	
 Object 	🙎 Highlight	Replace
Roles:	link,focusable,element	
Name:	"Sign in"	
ID Method:	JavaScript	~ 6
JavaScript:	evalXPath("//a[text()=\"Sign in\"]");	
Related Ob	ojects (0)	

Sometimes the application does not go straight to the login page. Therefore, insert this optional step, just in case. If the **Sign in** link does not appear, this step is ignored.

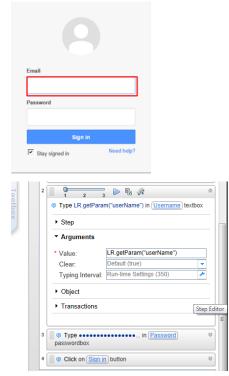
Note: Since providers make changes in their services, you may need to make changes to your scripts to maintain the same outcome.

Click in Username Textbox



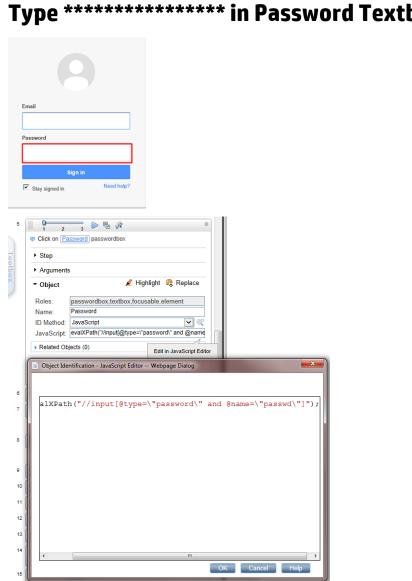
You can either select the Automatic or JavaScript ID method. For the JavaScript ID Method, enter the following in the JavaScript field: evalXPath("//input[@type=\"email\" and @name=\"Email\"]");
There are cases when you will change the ID Method, as we will see later.

Type LR.getParam('userName') in Username Textbox



Type the username to the Username textbox.

Since we are using parameters, you can enter the *LR.getParam("userName");* command in the **Value** field and the result is the defined username.



Similar to the Click in Username Textbox step, you can select the Automatic or JavaScript ID method.

For the JavaScript ID Method, enter the following in the JavaScript field:

evalXPath("//input[@type=\"password\" and @name=\"passwd\"]");

1 2 : Type ••••••) 🕨 🗟 🚀		swordbox	*			
 Step 							
 Arguments 							
* Value:	// Calling pwdE	Decrypt() functio	n for paramete				
Clear:	Default (true)		-				
Typing Interval:	Run-time Setti	ngs (350)	/				
JavaScript Argur	nents Editor V	Webpage Dialog)				×
2 LR.ev	lling pwd alC("pwdD Param("p	ecrypt");		on for	parame	əter	decrypti
2 LR.ev	alC("pwdD	ecrypt");		on for	parame	eter	decryptic

Type a password in the **Password** textbox. To display an encrypted password (so no one can see it), type the following:

```
// Calling pwdDecrypt() function for parameter decryption
```

```
LR.evalC("pwdDecrypt");
```

```
// This is a parameter with a decrypted value
```

```
LR.getParam("passwd2");
```

The pwdDecrypt() function is defined in C-function.c file:

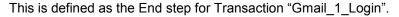
```
void pwdDecrypt() {
    Ir_save_string(lr_decrypt(lr_eval_string("{passwd}")), "passwd2");
    /*If you need to get some value from external parameter file*/
    lr_output_message(lr_eval_string("passwd2"));
}
```

passwd is the parameter defined for external use (BSM – EUM) and is encrypted.

passwd2 is the parameter seen only within this script instance.

Click Sign in

9			
Email			
Password			
•••••			
Sign in Stay signed in	Need help?		
	Fu (a ×		
Click on Sign in button Click on Sign in button Step Arguments			
▼ Object	🔏 Highlight 🛛 💦 Replace		
Name: Sign in ID Method: JavaScript			
	"//input[@type=\"submit\" and @n aScript Editor Webpage Dialog		×
1 evalXPath("		mit\" and @name=\"sig	nIn\"
4			
5 0 6 0			
P			
11 12			
13			
22	"	OK Cancel He	ip



The JavaScript ID Method used is:

```
evalXPath("//input[@type=\"submit\" and @name=\"signIn\" and
@value=\"Sign in\"]");
```

The End Event Step is set to automatic. So in this case, the End Event Step is **Step Synchronous network completed**. The step ends when all HTTP requests have completed excluding requests initiated by XMLHttpRequest.

Transaction — Gmail_2_Send_mail

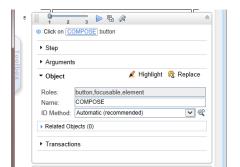
Transaction Editor Webpage Diak	log	x
Transactions	Properties	
Gmail_1_Login Gmail_2_Send_mail Gmail_3_Delete Gmail_4_Logoff	General Name: Gmail_2_Send_mail Appl Start Point	
	Clos	e

The name of this transaction is "Gmail_2_Send_mail".

This transaction contains all the steps necessary for sending an email to the logged in user with a unique subject field.

Click Compose

COMPOSE	Primary	Google+ team	Promotions	+	
Inbox (4) Starred	🗌 🚖 📂 me	gmail1382948531			Oct 28
Important Sent Mail	🗌 🚖 👝 me	vugent@gmail.com			Oct 27
Drafts (1,317)	🗌 🚖 😑 Vugen Jednostavan	gmail111			Oct 27
▶ Circles More ◄	🗌 🛱 📄 me	Gmail1382767431			Oct 26
MOIG *	☆ 📂 me	Gmail 1			Oct 21



When you click **Compose**, a form appears for sending a new email. By running a script multiple times, we can confirm that this element is recognized using the Automatic ID method.

	Primary	Social Google+ team	Promotions +	
nbox (4) Starred	🗆 🚖 📂 me	gmail1382948531		Oct 28
mportant	🗆 🚖 📂 me	vugent@gmail.com		Oct 27
Sent Mail Drafts (1,317)	🗌 🚖 📄 Vugen Jednostavan	gmail111		Oct 27
Sircles	🗆 🚖 📂 me	Gmail1382767431		Oct 26
fore - Vugen -	🗌 🚖 📂 me	Gmail 1		Oct 21
			Subject	
1	2 5	o textbox		
	R.getParam("userName") in []			

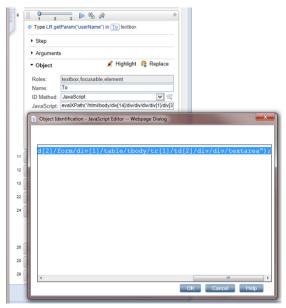
Type LR.getParam('userName') in To Field

To make this script robust, we use parameters. Therefore, if the username or password is changed at a later time, you do not need to change the script, only the parameter's value. The username is in the form of an email address.

The ID method used in this example is JavaScript:

```
evalXPath("/html/body/div[14]/div/div/div/div[1]/div[3]/div[1]/div[1]
/div/div/div/div[3]/div/div/div[4]/table/tbody/tr/td[2]/form/div[1]/t
able/tbody/tr[1]/td[2]/div/div/textarea");
```

But this is not a good example, so it is better to use Firebug.



Click Subject Field

COMPOSE	_	Social Tree	-		
Inbox (4)	Primary	Google+ team	Promotions	*	
Starred	🗌 ☆ 📄 me	gmail1382948531			Oct 28
Important Sent Mail	🗌 🚖 📂 me	vugent@gmail.com			Oct 27
Drafts (1,317)	🗌 🚖 😑 Vugen Jednostavan	gmail111			Oct 27
 Circles More + 	🗆 🚖 📂 me	Gmail1382767431			Oct 26
	🗌 🚖 📂 me	Gmail 1			Oct 21
Rew Hangout S					
Find friends to chat with			No	w Message	_ ~ ×
B Au			То		Cc Bcc
			Su	±	
12		*			
× 1 2	3 ▶ № á¢	~			
Click on suc	textbox) textbox				
 Step 					
 Arguments 					
 Object 	尾 Highlight	Replace			
Roles:	textbox,focusable,element				
	subjectbox				
	JavaScript	✓			
JavaScript:	evalXPath("/html/body/div[14]/div/di	v/div/div[1]/div[3			
📄 Object Ider	ntification - JavaScript Editor Web	page Dialog	×		
[3]/div	/div/div[4]/table/t	body/tr/td[2]/form/	div[3]/input");		
22					
24					
26					
28					
20					
30					
31			m Þ		
		OK	Cancel Help		
L					

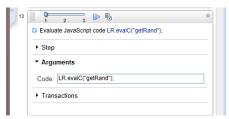
Click in the Subject field to select it. The ID method used is JavaScript:

evalXPath("/html/body/div[14]/div/div/div/div[1]/div[3]/div[1]/div[1] /div/div/div/div[3]/div/div/div[4]/table/tbody/tr/td[2]/form/div[3]/i nput");

But this is not a good example, therefore, it is better to use Firebug usage:

```
evalXPath("//input[@placeholder=\"Subject\" and
@name=\"subjectbox\"]");
```

Evaluate JavaScript code LR.evalC('getRand');



This is a very important step. By calling this function, we create a Subject value.

The *getRand()* function is defined in C-function.c file:

```
void getRand() {
typedef long time_t;
time_t t;
lr_param_sprintf("randnum2","bpm%d",time(&t));
}
```

COMPOSE	Primary	Google+ team	Promotions	+	
abox (4) itarred	🗌 🚖 📂 me	gmail1382948531			0
nportant	🗆 🚖 📂 me	vugent@gmail.com			0
ient Mail Frafts (1,317)	🗌 🚖 📂 Vugen Jednosta	ivan gmail111			0
lircles	🗆 🚖 📂 me	Gmail1382767431			0
fore +	🗆 ☆ 📂 me	Gmail 1			0
	Interval: Run-time Settir	•			 C
 Object Transa 					
Transa Transa JavaSci JavaSci JavaSci					

Type LR.getParam('randnum2'); in Subject Field

In this step, we acquire the value from the parameter:

```
LR.getParam("randnum2");
```

Click Send

Arguments	3
 Object 	🙎 Highlight 🛛 😰 Replace
Roles:	button,focusable,element
Name:	Send
ID Method:	JavaScript
JavaScript:	evalXPath("//*[text()=\"Send\"]");
Related Ob	jects (0)
Transaction	

Click **Send**. The Send button is easy to recognize so there was no need for any additional corrections.

The ID Method is JavaScript:

evalXPath("//*[text()=\"Send\"]");

Transaction — Gmail_3_Delete

Transaction Editor Webpage Dial	og		×
Transactions	Propertie	S	
+ X			
Gmail_1_Login	General		
Gmail_2_Send_mail Gmail_3_Delete	Name:	Gmail_3_Delete Apply	
Gmail_4_Logoff	Start Poin	t	
	Step:	26. Action:Click on Refresh button	-
	Event:	Action started	•
	End Point	1	
	Step:	31. Action:Click on button (6) button	
	Event:	After step ended	•
		Close	

The name of this transaction is "Gmail_3_Delete".

This transaction contains all the steps necessary for checking and deleting an email that was sent in the current interaction.

Click Refresh

Primary	Social Tree Google+ team Promotions +	
] 🚖 📂 me	gmail1382948531	Oct 28
🗋 🏠 🛑 me	vugent@gmail.com	Oct 2
🕆 📄 Vugen Jednosta	an gmail111	Oct 2
🗅 🏠 📂 me	Gmail1382767431	Oct 26
🗋 🚖 📂 me	Gmail 1	Oct 21
26 1 2 © Click on Re > Step	3 ▶ ₨ @ @ A	
Click on Re Step Arguments	Best) button	
Click on Re Step Arguments Object	witton ✔ Highlight I Replace	
Click on Re Step Arguments	Best) button	
Click on Re Click on Re Step Arguments Object Roles: Name:	✔ Highlight Replace	
Click on Re Click on Re Step Arguments Object Roles: Name:	Highlight Replace button,element Refresh Automatic (recommended) Ref	

If the email still has not arrived, repeat the previous step (Click Settings) and this step (Click Refresh).

Evaluate JavaScript code var Sub=LR.getParam('randnum2')

18 1	T 🕨 🖏	
1 2	3 0 0	
Evaluate JavaS	cript code var Sub1=LR.getParam("ra	ndnum2");
 Step 		
 Arguments 		
Code: var Sub1	=LR.getParam("randnum2");	JS
Transactions	var Sub1=LR.getParam ("randnum2");	

Create the Sub1 variable and get its value from the parameter randum2:

var Sub=LR.getParam("randnum2");

This variable is used to check (identify) and delete a specific account. The life span of this variable is within the page. When you change the page, you must re-evaluate this JavaScript if you need a value from the *randum2* parameter.

	Primary	Social 1 new Google+ team	Promotions	+	
5)	🗆 📩 📄 me	gmail1383144221			3:44 pn
ıt	🗌 📩 📄 me	gmail1382948531			Oct 2
il 1,317)	🗆 📩 📄 me	vugent@gmail.com			Oct 2
	🗌 📩 📄 Vugen Jednostavan	gmail111			Oct 2
	🗌 🏠 📄 me	Gmail1382767431			Oct 2
gen -	🗌 ☆ 📂 me	Gmail 1			Oct 2
Name: Ar ID Method: Ja	Highlight Repl ecorator,element gsContext Sub wx8Script vaIXPathr(//bftext)=\""+window.Subject+";				
1 //eval)	on JavaScriptEditor Webpage Dialog KPath ("//b[text()=\""+wi Ath ("//b[text()=\""+Args	ndow.Subject+"\"]");			

The ID Method is JavaScript:

```
evalXPath("//span[text()=\""+ArgsContext.Sub+"\"]");
```

The specific email is found.

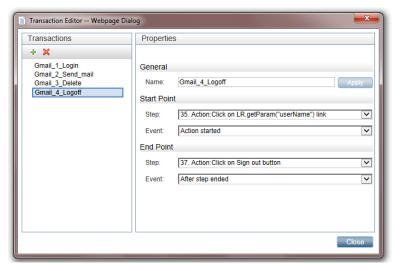
Click Button (6)

-14000444004			
ail1383144221	bitex x	ė s	
to me 💌		3.44 PM (0 minutes ago) 🚖 🔺 👻	
. Click here to E	legily or Earward		
Download An Largest Collecti MoboGenie.com	droid Apps on of Android Apps. Save Data Cost. Try Mobogenie Nowl NDewnisad-Android-Apps	Ads - Why this ad?	
	encennese / encen / epo		
	n na		
0 1 2	3 区 强 梁 《"Alternative steps 《 Iton ⑥ button		
0 1 2	3 D 🖏 🖉 X Alternative steps		
1 2	3 ▶ ℛ .☆Alternative steps		
Click on D	3 ▶ ℛ .☆Alternative steps		
Click on b Step Argument	3 ▶ B		
Click on D Step Argument Object	s ≥ 🤹 🖉 x [×] Atternative steps iton (6) button S ✓ Highlight 🚱 Replace		
Click on D Step Argument Object Roles:	s button,element		

The **Delete** button (button(6)) is easy to recognize.

This step completes Gmail_3_Delete mail.

Transaction — Gmail_4_Logoff



The name of this transaction is "Gmail_4_Logoff".

This transaction contains all the steps necessary for logging off.

Click LR.getParam('userName')

		 Q 		+Vugen 🔛 🔔 Sh	are
C Mor		s been moved to the Trash. Learn more Undo		1–5 of 5 < >	\$
Primary	Social Google+ learn	Promotions	+		
me me	gmail1382948531				Oct 28
📄 me	vugent@gmail.com				Oct 2
📄 Vugen Jednostavan	gmail111				Oct 27
📄 me	Gmail1382767431				Oct 26
👝 me	Gmail 1				Oct 21
1 2	3 ▶ № & @ Param <u>("userName")</u> link	×			
Click on LR.get	3	*			
Click on LR.get	3				
Click on LR.get Step Arguments Object	Param("userName")) link				
Click on LR get Step Arguments Object Roles: link	Param("userName")) link	Replace			
Click on <u>LR getf</u> Step Arguments Object Roles: <u>link</u> Name: LR getf	2aram("userName") link				
Click on LR getf Step Arguments Object Roles: link Name: LR getf	Arami'userName') link Kernet Kernet K	Replace			
Cick on <u>LR aet</u> Step Arguments Object Roles: <u>link</u> Name: <u>LR r</u> ID Method: Aut	Arami'userName') link Kernet Kernet K	Replace			
© Click on [<u>R get</u>] > Step > Arguments • Object Roles: link Name: LR, ID Method: Aut • Related Objects	Arami'userName') link Kernet Kernet K	Replace			
© Click on [<u>R get</u>] > Step > Arguments • Object Roles: link Name: LR, ID Method: Aut • Related Objects	arami'userName') link Highlight (focusable,element gelParam('userName') omatic (recommended) (0)	Replace			

We used the same parameter as we did for the Login:

LR.getParam("userName")

Click Sign out

Primary	Social Coogle+ team	Pror	notions	+		Account – Privat
🔆 📂 me	gmail1382948531					
🚖 📂 me	vugent@gmail.com				Add ad	Sign out
🚖 😑 Vugen Jednostav	an gmail111					Oct 2
🚖 📂 me	Gmail1382767431					Oct 2
🚖 📂 me	Gmail 1					Oct 2
1 z 3 Click on Sign out	▶ 🖶 🖟 button	*				
i 2 3 Click on <u>Skan out</u> Step Arguments Object Roles: <u>buttor</u> Name: <u>Sign of</u>	Mighlight R					
	Mighlight R	Replace				

By clicking **Sign out**, we end this transaction and script.

All we need to do now is close the active tab.

Chapter 5: Cloud CRM Provider – Salesforce Transaction Flow

This case study uses Salesforce cloud service. The case study uses one flow/script with the following transactions:

- 1. Login Open a login page, enter your credentials, and confirm that the first page loads.
- 2. Create item (account) Open a new account with a unique account name.
- 3. Delete item (account) Check for this account, select it and delete it.
- 4. Logoff Log off from the web application.

The main purpose of running this script is to confirm that the application's processes run successfully. If successful, the transactions complete without any errors.

You can view a sample Salesforce script by downloading the following file: <u>http://support.openview.hp.com/selfsolve/document/KM00658288/binary/BPM_Monitoring_S</u> <u>olutions-SalesForce_Trial.zip</u>

General Flow

Salesforce is a cloud CRM (Customer Relationship Management).

A sequence of transactions creates the business process flow. A transaction is a unit that is measurable by availability and performance. Therefore, we group activities that perform a specific transaction.

To describe and validate these transactions, logically group the transactions into the following steps:

- 1. Login.
 - a. Navigate to https://login.salesforce.com.
 - b. Enter your credentials and confirm that the first page loads.
- 2. Create a new account.
 - a. Click New Account.
 - b. Enter a unique account name.
 - c. Save the account.
- 3. Delete the account.
 - a. Check if the account was created
 - b. Select the account.
 - c. Delete the account.
- 4. Logoff
 - a. Log off from the web application

The following sections describe how to create these transactions.

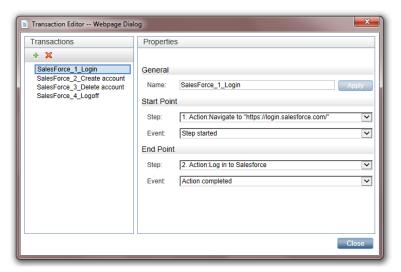
A good approach, before using this tool, is to know what we want to achieve. Create a blueprint as follows:

- 1. Run the Salesforce web application in Internet Explorer 9. Perform the steps of the flow and create annotations.
- 2. Determine the boundaries that form the transactions.
- 3. Select which values to assign to the parameters.
- 4. Select what values to protect and encrypt.

Record all the information you collect ,since it will come in handy later.

We recommend you start using the script. Refer to sections in this document for assistance.

Transaction SalesForce_1_Login



Define the name of the transaction. In this example, we call the transaction "SalesForce_1_Login". Naming conventions should provide a clear view of the application, the transaction order, and create an overview of the business processes covered by this transaction.

Define the steps and events for the starting and ending points of the transaction. The most convenient event for the start step is **Action started**. The most convenient event for the end step is **After step ended**.

This transaction contains all the steps necessary for logging into the Salesforce application.

Navigate to 'https://login.salesforce.com/'

User Name		
User Marile		
Password		
Log	j in to Salesforce	
Remember	User Name	
Forgot your pa	ssword? Sign up for fi	ree.
I Start Trans	saction:SalesForce_1_Login	
1 1 2	3 🕨 🛍	~
Navigate to "htt	tps://login.salesforce.com/"	
✓ Step		
Action:	Navigate	\checkmark
Step Timeout:	Run-time Settings (180)	1
Minimum Time:	Default (0)	•
End Event:	Automatic:Document Loaded	\sim
 Arguments 		
 Transactions 		Step Editor

In the Navigation step, specify the URL.

While recording, VuGen automatically selects the appropriate End Event, in this case **Document downloaded**. The step ends when the process of loading a document completes. In most cases, you can freely select the default values.

If the pages load slowly, you can use a Wait step to make sure the page loads. For information on Wait steps, see *Meaning of Wait Step* on page 89.

Type LR.getParam('userName') in User Name Textbox

User Name
Password
Log in to Salesforce
Remember User Name
Forgot your password? Sign up for free.
2 Clog in to Salesforce
Type LR.getParam("userName") in User Name lextbox Step
Step Arguments
✓ Object
Roles: textbox, focusable, element
Name: User Name ID Method: JavaScript 💟 🕰
JavaScript: evalXPath("//nput(@type=l'email\" and @na
Diject Identification - JavaScript Editor Webpage Dialog
<pre>valXPath("//input[@type=\"email\" and @name=\"username\"]"); </pre>
5
7 7
9 (p)
11 01
OK Cancel Help
13 A Wait 3 connote

This step is actually a sub-step of Log in to SalesForce.

You can either select the **Automatic** or **JavaScript** ID method.

evalXPath("//input[@type=\"email\" and @name=\"username\"]");

There are cases when you will change the ID Method, as we will see later.

Type your username in the User Name textbox.

Since we are using parameters, you can enter the *LR.getParam("userName");* command in the **Value** field and the result is the defined username.

BPM Monitoring Solutions Best Practices Chapter 5: Cloud CRM Provider – Salesforce Transaction Flow

	Log in to Salesforce	*
2	Type LR.getParam("userName") in User Name lextbox Type LR.getParam("userName") in User Name lextbox Arguments Value: LR.getParam("userName") as Clear: Default.tnuch Clear: Typing Interval: Rur LR.getParam("userName") Object Transactions	*
4	Type • in Password passwordbox	*
5	Click on Log in to Salesforce button	8



Type a password in the **Password** textbox. To display an encrypted password (so no one can see it), type the following:

// Calling pwdDecrypt() function for parameter decryption

```
LR.evalC("pwdDecrypt");
```

// This is a parameter with a decrypted value

LR.getParam("passwd2");

The pwdDecrypt() function is defined in C-function.c file:

```
void pwdDecrypt() {
```

```
lr_save_string(lr_decrypt(lr_eval_string("{passwd}")),"passwd2");
/*If you need to get some value from external parameter file*/
lr_output_message(lr_eval_string("passwd2"));
}
```

passwd is the parameter defined for external use (BSM – EUM) and is encrypted. passwd2 is the parameter seen only within this script instance.

Click Log in to Salesforce

 Step 	
Argument	S
▼ Object	🙎 Highlight 🛛 💦 Repl
Roles:	button,focusable,element
Name:	Log in to Salesforce
ID Method:	JavaScript
JavaScript:	evalXPath("//button[@id=\"Login\"]");
Related Ot	jects (0)
▶ Transaction	005

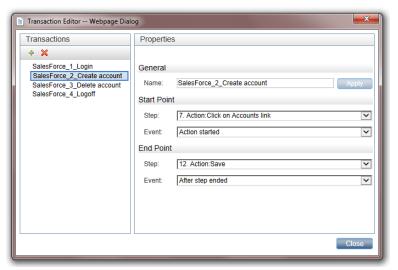
This is defined as the End step for transaction "SalesForce_1_Login".

The JavaScript ID Method used is:

```
evalXPath("//button[@id=\"Login\"]");
```

The End Event Step is set to automatic, and in this case is **Step Synchronous network completed**. The step ends when all HTTP requests have completed excluding requests initiated by XMLHttpRequest.

Transaction SalesForce_2_Create account



The name of this transaction is "SalesFoerce_2_Create account".

This transaction contains all the steps necessary for creating an account.

Click Accounts

Home Genting Stanted Contacts Eccounts Leads Opportunities Reports Dashboar	Chatter Files Products Forecasts +	
7 Start Transaction SalesForce_2_Create account 1 2 3 P P & CAlternative steps P Click on (Accounts) link • Step		
Arguments Object Collect Roles: Ink,focusable,element Accounts		
ID Method: JavaScript JavaScript V JavaScript: V V V V V V V V V V V V V		
	litor	

When you click **Account**, a form appears for listing accounts. By running the script multiple times, we can confirm that this element is recognized with the Automatic ID method.

You can also use the **JavaScript** ID method:

```
evalXPath("//a[text()=\"Accounts\"]");
```

Click New

Home		Tell me morel Help for this Page
ew: All Accounts Got Edit Create New View		
Recent Accounts		Recently Viewed •
Account Name	Billing City	Phone
sf1383417996		
sf1383414319		
sf1383413713		
sf1383416795		
sf1383413114		
sf1383411012		
sf1383409215		
sf1383402015		
rf1383399612		
sf1383395122		
Show 25 items		
Reports	Tools	
Active Accounts	Import My Accounts & Contacts	
Accounts with last activity > 30 days	Import My Organization's Accounts & Contacts	
Account Owners	Mass Delete Accounts	
Contact Role Report	Transfer Accounts	
Account History Report	Merge Accounts	
Partner Accounts	Sales Methodologies	
Go to Reports =		
	~	
1 2 3		
Click on New button		
Click on New button		
Click on New button Step		
© Click on (<u>New</u>) button > Step > Arguments ■ Object		
Click on (New) button Step Arguments Object Roles: button,focusable,element		
Click on (New) button Step Arguments Object Roles: button,focusable,element		

When you click **New**, a form appears for creating a new account. By running the script multiple times we can confirm that this element is recognized with the Automatic ID method.

You can also use the **JavaScript** ID method:

```
evalXPath("//input[@type=\"button\" and @name=\"new\" and @value=\" New \"]");
```

Click Account Name Textbox

		Save Save & New	Cancel				
Account Informat	ion						= Required information
	Account Name TypeNone-			Pan	ent Account Phone	Bozidar Protulipac Societar Protulipac None	
Address Informat	ion						Copy Billing Address to Shipping Addre
	Billing Country United States Billing Street Billing City Billing State/Provisce Billing Zip/Postal Code		2	Ship	hipping Street	United States	×
1 100	ick on (*Account Name) textbox	*					
	tep						
100	rguments						
		hlight 😰 Replace					
• (oject ×	A					
÷ (les: textbox,focusable,ele me: *Account Name	e Replace the test object	1				
← (Ro Na	les: textbox,focusable,el						
+ C Ro Na	les: textbox,focusable,el/ me: *Account Name						

Click Account Name textbox.

To make this script robust, we use parameters. Therefore, if the username or password is changed at a later time, you do not need to change the script, only the parameter's value. The username is in the form of an email address.

Type LR.evalC('getRand'); var...randnum2'); Sub; in Account Name Textbox

			_	_												
Home Gettir	ng Started	Contacts	Accou	nts Leads	Opportun	ities R	eports	Dashboards	Chatter	Files	Products	Forecast	s +			
New	Account	it														Help for this Page 🥹
Account E	dit					Save	Save & No	tw Cancel								
Account In	formation														1 - 5	Required Information
		Account Na	ame 🚺									Acc	ount Owner	Bozidar Protulipac		
				None	1							Pare	ent Account	<u></u>		
		Web					_						Phone			
		Descript	son [*							None		
													Employees			
Address In	formation														Copy Billing Address to	Shipping Address
		Billing Cour	ntry [United States				×				Shippi	ing Country	United States	-	
		Billing St	reet		N N							Ship	ping Street	×		
		Billing	City									Sł	sipping City			
	Billi	ng State/Provi	ince [None								Shipping Sta	te/Province	None 💌 🗈		
	Billin	g ZipiPostal C	ode [5	Shipping Zip/9	Postal Code			
						Save	Save & No	tw Cancel								
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4				getRar		ant D		("randn				- 11				
	3	Sub;	D-W1	Lndow.s	ub-LR.	getra	ar am	("randn	umz)	,		- 11				
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Cran																
🗒 🛛 V																
								011	_		_					
0 V								OK	Ca	incel	Help					

By calling this function, we create a Subject value.

The getRand() function is defined in C-function.c file:

```
void getRand() {
typedef long time_t;
time_t t;
lr_param_sprintf("randnum2","sf%d",time(&t));
```

In this step, we acquire the value from the parameter:

LR.getParam("randnum2");

Click Save

ome Getting Started	Contacts Acco	ounts Leads	Opportunities	Reports	Dashboards	Chatter	Files	Products	Forecasts	+		
New Account	nt											Help for this Page
Account Edit			Save	Save & N	ew Cancel							
Account Information												- Required Information
		sf1383415434								nt Owner	Bozidar Protulipac	
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	Description			× ×						Industry	None	
		1		¥.					Er	ployees		
Address Information												Copy Billing Address to Shipping Addres
	Billing Country	United States			×				Shipping	Country	United States	
	Billing Street		1		_				Shippi	ng Street	×	_
	Billing City	[Ship	ping City		
	ling State/Province	None	•						Shipping State!		None	
Billi	ng ZipiPostal Code							5	ihipping Zip/Pos	ital Code		
			Save	Save & N	ew Cancel							
	Click on Step			High	light 🔞	Rep	lace	_				
	Roles:	button	focusabl	e elen	nent			1				
	Name:	Save		-,			_	11.				
	ID Method		iatic (reco	mmeno	ded)	•	 G 	2				
	Related C	Objects (O)									
	• Transac	tions						=	E			
	End Transa	ction:Sale	esForce_2	_Creat	e accour	ıt						

Click **Save**. The **Save** button is easily recognized so there is no need for corrections.

Transaction SalesForce_3_Delete account

Transaction Editor Webpage Dialog									
Transactions	Propertie	S							
+ X									
SalesForce_1_Login SalesForce_2_Create account	General								
SalesForce_3_Delete account	Name:	SalesForce_3_Delete account	Apply						
SalesForce_4_Logoff	Start Poin	Start Point							
	Step:	15. Action:Click on Accounts link	~						
	Event:	Action started	~						
	End Point								
	Step:	23. Action:Press "OK" in confirmation dialog	~						
	Event:	After step ended	~						
			Close						

The name of this transaction is "SalesForce_3_Delete account".

This transaction contains all the steps necessary for checking and deleting an account that was created in the current interaction.

Click Accounts

me Getting Started C	Contacts Accounts I	eads Opportunities	Reports Dashboa	rds Chatter	Files	Products	Forecasts +	
sf13834	15434							Customize Page Edit Layout Printable View Help for this Page
4- Hide Feed	-							
🗇 Post 🏭 File 🦧	Task More +			allow				
Write something			Share					
Q Show All Updates			No fo	lowers.				
There are no updates.								
ccount Detail	Account Name sf1383415	434 [View Hierarchy]	Delete				Account Own	er Bozidar Protulipac (Chance)
Type Website					Parent Account Phone			
	Description						Indus	iry
							Employe	79
Click on Ac	0		steps 🔗					
 Step 								
 Arguments 								
 Object 		🙎 Highlight	Replace					
Roles:	link,focusable,ele	ement						
	Accounts							
	JavaScript		▼					
	evalXPath("//a[tex	()=\'Accounts\"]")	1	=				
Related Obj	ects (0)							
 Transaction 	ns							
			Ste	p Editor				
L								

Click **Account** to open a form that lists the accounts.

By running the script multiple times, we can confirm that this element is recognized with the Automatic ID method.

You can also use the JavaScript ID Method:

```
evalXPath("//a[text()=\"Accounts\"]");
```

Evaluate JavaScript code var Sub1=LR.getParam('randnum2')

Evaluate JavaS	cript code var Sub1=LR.getParam("ra	andnum2
 Step 		
 Arguments 		
Code: var Sub1	=LR.getParam("randnum2");	
	A.	

Create the Sub1 variable and get its value from the parameter randum2:

var Sub1=LR.getParam("randnum2");

This variable is used to check (identify) and delete specific email sent within this interaction. The life span of this variable is within the page. When you change the page you must evaluate this Java script again if you need a value from the *randum2* parameter.

Click ArgsContext.Sub1

Home		Tell me more! Help for this Pr
		Les me more: I map to mus re
View: All Accounts Got Edit Create New View		
Recent Accounts New		Recently Viewed
Account Name	Billing City	Phone
11393415434		
s11383417996 s11383414319		
sf1383413713		
sf1383416795		
sf1383413114		
<u>sf1383411012</u>		
s11383409215 s11383402015		
s11383399612		
Show 25 items		
Reports	Tools	
Active Accounts Accounts with last activity > 30 days	Import My Accounts & Contacts Import My Organization's Accounts & Contacts	
Accounts with last activity > 30 days Account Owners	Import My Organization's Accounts & Contacts Mass Delete Accounts	
Contact Role Report	Transfer Accounts	
Account History Report	Merge Accounts	
Partner Accounts	Sales Methodologies	
Go to Reports »		
Arguments Object Mighlight Replace Roles: link.focusable.columnheader.element Name: ArgsContext.Sub1		
ID Method: JavaScript		
ID Method: JavaScript JavaScript: evalXPath("//a[text()=\""+ArgsContext.Sub1+`\"]");		
JavaScript: evalXPath("//a[text()=\""+ArgsContext.Sub1+"\"]");		
JavaScript: evalXPath("//a[text()=\""+ArgsContext.Sub1+"\"]");		
JavaScript: evaD/Path("/ia[text])=i"*ArgsContext Sub1="\"]"); Object Identification - JavaScript Editor Webpage Dialog		
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JavaScript evaO/Path("la[text)=\"-+ArgsContext Sub1+~\77x" Diget Identification - JavaScript Editor Webpage Dialog 1 evalXPath ("//a[text()=\""+ArgsContext.Su		
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JavaScript. evaXVPath("la[text)=""+ArgsContextSub1+"TJ".] Dbject Identification - JavaScript Editor Webpage Dialog evaIXPath("//a[text()=\""+ArgsContext.Su a		
JavaScript evaVPah("(a[text)=\"+ArgsContextSub1=\TTX) Dbject Identification - JavaScript Editor Weebpage Dialog evalXPath ("//a[text()=\\""+ArgsContext.Su		

To identify an object, the name must be configured as ArgsContext.Sub1.

The ID Method is JavaScript:

evalXPath("//a[text()=\""+ArgsContext.Sub1+"\"]");

The specific account is found.

Click Delete

V Home		Tell me morel Help for this Page
ew: All Accounts Got Edit Create New View		
lecent Accounts New		Recently Viewed 💌
Account Name	Billing City	Phone
11383415434		
11383417996		
<u>r1383414319</u>		
r1383413713		
r1383416795		
r1303413114		
r1383411012		
r1383409215		
r1383402015		
if1383399512		
Show 25 items		
Reports	Tools	
Active Accounts	Import My Accounts & Contacts	
Accounts with last activity > 30 days	Import My Organization's Accounts & Contacts	
Account Owners	Mass Delete Accounts	
Contact Role Report	Transfer Accounts	
Account History Report	Merge Accounts	
Partner Accounts	Sales Methodologies	
	Dates Intelligenciates	
Go to Reports »		
Click on Delete button		
 Step 		
Arguments		
Arguments Object		

The **Delete** button is easy to recognize.

This step completes SalesForce_3_delete account.

Transaction SalesForce_4_Logoff

Transaction Editor Webpage Dial	g	×
Transactions	Properties	
• X		
SalesForce_1_Login	General	
SalesForce_2_Create account SalesForce_3_Delete account	Name: SalesForce_4_Logoff	Apply
SalesForce_4_Logoff	Start Point	
	Step: 31. Action:Click on User menu	~
	Event: Action started	~
	End Point	
	Step: 33. Action:Click on Logout link	\checkmark
	Event: After step ended	~
		Close

The name of this transaction is "SalesForce_4_Logoff".

This transaction contains all the steps necessary for logging off.

Click User Menu

	🖸 Setup Helpi		-
precasts +			
			-
		Tell me more! Help for this Page	• _
			<
		Recently Viewed	4
	Phone		
			-
& Contacts			
			-
📄 Object Iden	tification - JavaScript Editor V	Webpage Dialog	
- I			
1]/tabl	e/tbody/tr/td[3]/	div/div[2]/div	/div/div[1]/div[1]");
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22 23 24 (III) OK Cancel Help
22 23 24 4	L L L L L L L L L L L L L L L L	Ŕ	m , , , , , , , , , , , , , , , , , , ,
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zz zz zz zz zz zz zz zz c Cick on (1 z Cick on (1	ts element User menu JavaScript	Night 🕃 Replace	OK Cancel Help
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22 23 31 0 2 2 Click on Q • Step • Argumen • Object Roles: Name: ID Method	ts element User menu JavaScript evalXPath("/dvl(@id=1"contert	Night 🕃 Replace	OK Cancel Help
22 23 31 0 2 24 Click on Q 32 Click on Q 32 Click on Q 33 Click on Q 34	ser minu) Is Ver menu JavaSript evaRVPath//ldvf@id='Conter gyects (0)	Night 🕃 Replace	OK Cancel Help

When you click the arrow next to the user name, a dropdown menu appears.

The ID Method is JavaScript:

evalXPath("//div[@id=\"contentWrapper\"]/div[1]/table/tbody/tr/td[3]/ div/div[2]/div/div[1]/div[1]");

You might want to use Firebug here.

Click Logout

	Search									: • Setu		ning Subscribe Sales
									My Profile	Set Set	p nopa training	Jaies
Accounts Le	ads Opportunities	Reports	Dashboards	Chatter	Files	Products	Forecasts	+	My Profile My Settings			
					_				Developer Con	sole		
									Logout		Tell me n	tore! Help for this I
Got Edit Crea	ate New View											
	New											Recently Views
				Billing City						Phone		
				Billing Lity						Phone		
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	3 De By	<u>a</u>			*	I						
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 Click on Lo Step Argument 	oqout) link		ahliaht 🔐	Replace	*							
Click on L Step Argument Object	s	🖋 Hi	ghlight 💦	Replace	*							
 Click on Lo Step Argument 	oqout) link	🖋 Hi		Replace	*							
Click on L Step Argument Object	s	🖋 Hi		Replace	*							
Click on C	s link,listitem,focu Logout	🖋 Hi		Replace								
Click on C	s link,listitem,focu Logout Automatic (recom	🖋 Hi										
Click on L Step Argument Object Roles: Name: ID Method: Related Ot	Ink Istitem, focu Logout Automatic (recom gietts (0)	🖋 Hi										
 Click on [1] Step Argument Object Roles: Name: ID Method: 	Ink Istitem, focu Logout Automatic (recom gietts (0)	🖋 Hi										
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Click on C Step Click on C Step Argument Object Roles: Name: ID Method: Related Ot Transaction	Ink Istitem, focu Logout Automatic (recom gietts (0)	✓ Hi, sable,eler mended)	nent									

Click **Logout** to end this transaction and script.

The optional JavaScript ID Method is: evalXPath("//a[text()=\"Logout\"]");

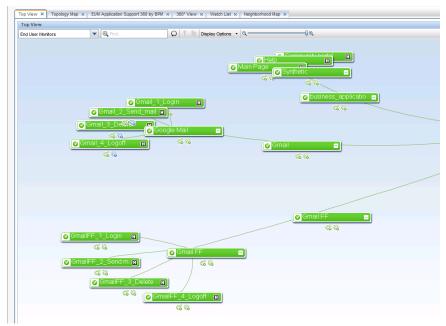
Chapter 6: Using Your Scripts to Monitor Your Cloud Service Provider

Isolating Performance Issues with HP BPM

BSM Service Health's Top View enables you to see the business performance of your system components at a glance. The CI bars in the component provide a visual representation of real-time IT performance metrics mapped onto business applications, based on the hierarchy structure defined for each view. The connecting lines between the bars define the relationships between the CIs.

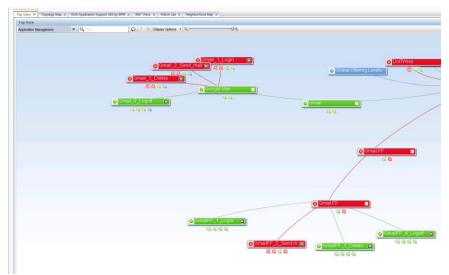
You can isolate performance issues with the scripts you create.

The following image is an *End User Monitors* view in Top View. It displays of a Gmail script with no performance issues.



Top View – End User MonitorsView

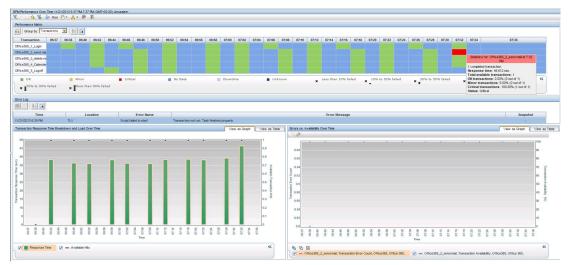
The following image is a Top View display of a Gmail script with "Send a mail" performance issue.



Top View – Performance Issues

From the Top View display you can drill down into the BPM Performance Over Time report to investigate a performance problem.

The *BPM Performance Over Time* report displays a matrix of the distribution of average transaction response times—organized by transaction or location—over a specified period of time. Additional components display different aspects of a selected transaction or of the transactions for a selected location. The report gives you the ability to investigate in more detail transaction hits for selected transactions or locations.

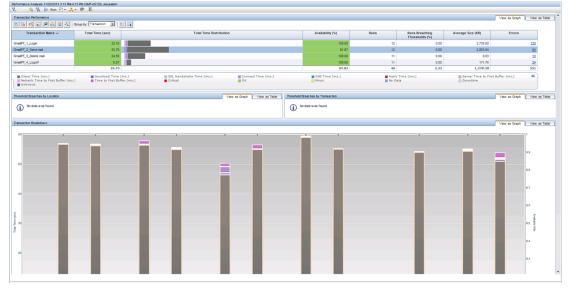


BPM Performance Over Time Report

From the BPM Performance Over Time report you can drill down to display the Breakdown Over Time component.

The *Breakdown Over Time* component helps you determine whether poor transaction response times are caused by network or server problems, or by client delays, and enables

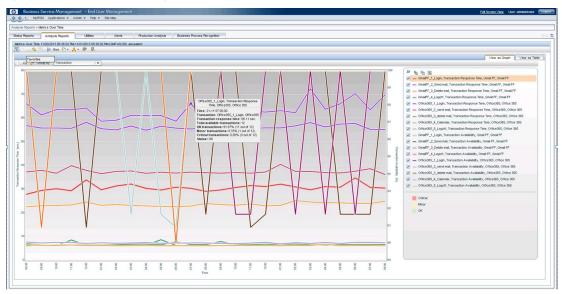
you to pinpoint exactly when the problems are occurring. Using the time range selector and active filters, you can highlight the exact time and source of a poorly performing transaction.



End User Management – Breakdown Over Time

You can also drill down to display the Metrics Over Time report.

The Metrics Over Time report enables you to select one or more metrics for selected applications and to view their behavior over a period of time. By selecting multiple metrics, you can compare their behavior to discover possible correlations between them. You can also view data for up to four different time comparisons.



End User Management - Metrics Over Time

Isolating Availability Issues with HP BPM

The *End User Monitor* view in Service Health's *Hierarchy* component displays the hierarchy of the CIs in a view, and the real-time status of each of the KPIs assigned to the CIs. KPIs are grouped into domains; you can collapse a domain and display the worst status of all the KPIs in a domain. You can also filter the display to only show CIs with KPIs of a specific status, or specific CI types.

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Service Health Hierarchy – End User Monitor View

From the Service Health Hierarchy – End User Monitor View you can drill down into the *BPM Performance Over Time – Performance Matrix*.

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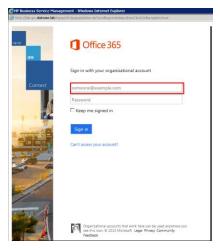
BPM Performance Over Time – Performance Matrix

The *Error Log Report* displays a list of errors that occurred in the selected BPM transactions, during a given time period.

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Error Log Report

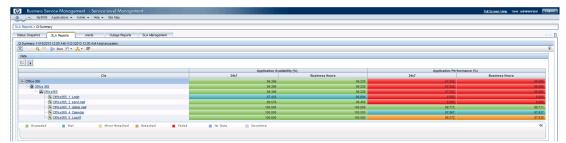
Creating a snapshot of an error as it appears when the error occurs saves time when opening support cases and provides additional information to aid in troubleshooting issues.



Defining, Tracking, and Reporting on SLAs

You can define, track, and report on service level agreements from a business perspective.

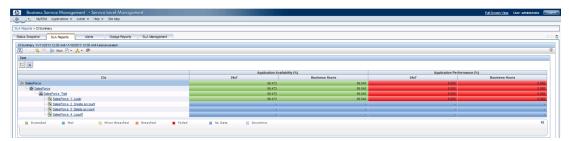
As shown in the images below, you can view the status of your cloud service provider's SLAs and OLAs.



SLA Report for Cloud Email Provider – Office 365



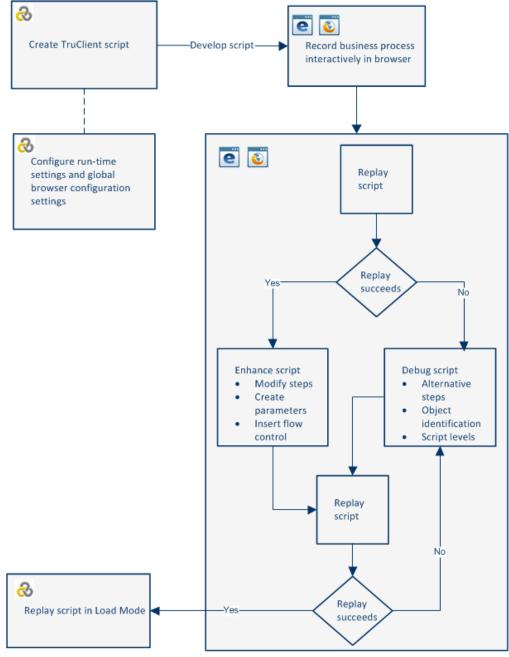
SLA Report for Cloud Email Provider - Gmail



SLA Report for Cloud CRM Provider - Salesforce

Appendix A: About TruClient for IE Protocol

The Ajax TruClient protocol interactively records scripts as you navigate through your business process. This enables TruClient to easily record and replay dynamic, complex web-based applications and create user friendly scripts. Scripts are created in real-time and steps can be seen in the TruClient sidebar as they are performed.



Ajax TruClient Workflow

The Ajax TruClient for IE protocol is designed to work with applications running in IE9 in standard mode only. When you need a deeper insight, use Firebug Lite (see *Use Firebug Lite* on page 86).

Based on LoadRunner's innovative Ajax TruClient technology, Mobile TruClient enables you to test web applications designed for mobile devices. With this protocol you can:

- Simulate various mobile browsers.
- Develop scripts that are recorded on the user level making them clear and easily maintained.



Mobile TruClient Workflow

Appendix B: Time to Value

There are a few concepts that can speed things up when creating Office 365 scripts.

Use Firebug Lite

Firebug Lite is a third-party utility that provides many valuable development tools. You can edit, debug, and monitor CSS, HTML, and JavaScript live in any web page. You can access this utility by selecting **Advanced > FireBug Lite** or by pressing **F12** while in TruClient's IE9 browser.

If other default ID methods fail during the replay, you can use Inspect mode in Firebug Lite to select the evalXPath() that will choose the correct object based on the HTML. This is useful when it comes to tricky objects.

Standard Steps

When you look at the script, you will notice that some steps repeat often. We can group these steps as follows:

- Navigate (navigate to a URL)
- Click Object (Link, Textbox, Button, or Decorator)
- Type in Text Object
- Evaluate JavaScript

Navigate

Keep in mind when navigating to a defined URL, the End Event value defines when this step finishes. An End Event can be one of the following:

- Action Completed The step ends when its action is completed. An example of an action is clicking a button.
- DOM load The step ends when the process of loading a document completes.
- **DOM content loaded** The step ends when the HTML parsing of the document completes.
- **Step network completed** The step ends when all HTTP requests have completed including requests initiated by XMLHttpRequest.
- Step synchronous network completed The step ends when all HTTP requests have completed, excluding requests initiated by XMLHttpRequest.
- **Dialog opened** The step ends when a dialog box is opened.

We recommend that you set the End Event to Automatic, as seen in this script.

BPM Monitoring Solutions Best Practices Appendix B: Time to Value

 Step 		
Action:	Navigate	~
Step Timeout:	Run-time Settings (180)	/
Minimum Time:	Default (0)	-
End Event:	Automatic:Document Loaded	~

Automatic End Event Setting for Navigate Step

Click Object (Link, Textbox, Button, or Decorator)

Two things are important for the Click on Object step:

- Arguments
- Object settings

The X and Y coordinates are defined relative to the object in the Arguments settings. If the coordinates are left empty, the click is executed in the middle of the object.

If the object is not recognized with the ID Method set to automatic, you will need to use the JavaScript ID Method. It relies on finding the required element or string in the HTML code. When you select the JavaScript ID Method, you can get:

- Straight forward syntax: evalXPath("//input[@type=\"email\" and @name=\"login\"]");
- Suspicious syntax: evalXPath("/html/body/div[5]/div/div[2]/div[3]/div/div[1]/div[6]/d iv/div/div[3]/div[2]/div[1]/div[7]/div/div/input");

When confronted with suspicious syntax, use Firebug Lite as described in *Use Firebug Lite* on page 86.

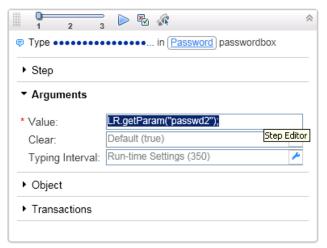
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Roles:	textbox,focusable,element
Name:	someone@example.com
ID Method:	JavaScript 💽 🥰
JavaScript:	evalXPath("//input[@type=\"email\" and @name=\"I
Related Ob	iects (D)

Straight Forward JavaScript Syntax for ID Method

Type in Text Object

Argument values can be plain text or a parameter. Examples are:

- Plain text "this is plain text typed in a text box"
- Getting a value from a parameter LR.getParam("passwd2");



Getting a Value from a Parameter – LR.getParam("passwd2")

Evaluate JavaScript

By evaluating JavaScript, you can call a function, for example:

```
LR.evalC("getRand");
```

Or define a variable that will be used later:

```
var Sub1=LR.getParam("randnum2");
```

1	2 3 P
Evaluation	ate JavaScript code var Sub1=LR.getParam("randnum2");
 Step 	
- Argu	ments
Code:	var Sub1=LR.getParam("randnum2");
. Tran	sactions

JavaScript Evaluation Step

Variables and ID Methods – How to Combine

To use a defined variable to find a specific and unique object:

- 1. Record the step by clicking that object.
- 2. To make a script more robust, make those changes:
 - Change Object name to: ArgsContext.Sub1
 - Change JavaScript ID Method to: evalXPath("//span[text()=\""+ArgsContext.Sub1+"\"]");

 Step 	
 Arguments 	à
 Object 	🖋 Highlight 🛛 😰 Replace
Roles:	button,element
Name:	ArgsContext.Sub1
ID Method:	JavaScript 🗨 🍳
JavaScript:	evalXPath("//span[text()=\""+ArgsContext.Sub1+"\"
Related Ob	iects (0)

Meaning of Wait Step

A Wait step is useful when you want to wait for a very heavy page to load and you do not want to timeout while waiting. Just put a Wait step after this load step and enter the number of seconds to wait.

Another example of when to use a Wait step is when a dialog box is in the script. This dialog box can be any of the following:

- Alert
- Authentication

- Confirmation
- Prompt
- Prompt Password

Put a Wait step between the step that caused the dialog box to open and the dialog box itself. In this way, you give the dialog box step time to complete.

	~
Click on Delete button	
► Step	
► Arguments	
► Object	
Transactions	
Wait 1 seconds	8
	~
Press "OK" in confirmation dialog	
► Step	
► Arguments	

Wait Step before Dialog Box Step

Appendix C: Script Validation Concept

Validation of the script within the VuGen domain, is performed by replaying the script.

You can replay the script in the TruClient for IE browser or the main VuGen window. What is important is to define the run-time settings:

- **Pacing** Define the number of iterations to be used for testing. Test the script multiple times to see how it behaves.
- Log When troubleshooting, use the extended log to locate problems quickly.
- Replay Select the Failed end event causes step failure option

General	General: Replay	
Pacing Additional attributes	Options:	
Log	Property	Value
Replay	Simulate a new user on each iteration	
Browser Settings	 Replay options 	
Other Settings	Replay using recorded duration for steps	
ound douingo	Failed end event causes step failure	
	Maximum time for object-not-found (seconds)	20
	Step timeout (seconds)	180
	Inter-step interval (milliseconds)	500
	End-of-network identification timeout (milliseconds)	3000 -
	Typing interval (milliseconds)	350
	- Minimum Time	
	+ 🗖 Random step's minimum time within range:	
	A. A	
	Failed Failed end event causes step failure If the End Event of a step fails, the step fails. For example, if the Document Loaded' and the document fails to load, the step fail	

Failed End Event Causes Step Failures Option

- Browser settings If a proxy is used, configure it for testing purposes.
- Other settings The most valuable setting is to generate a snapshot of the error.

- General Pacing	Load: Other Settings		
Additional attributes Log Basiles	Options: Property	Value	
⊢Replay Load Prowser Settings Other Settings	Snapshots generation Replay snapshots generation Never O Never O on error Aways		
	Action on error Action on error Abort script O Continue to the next iteration Non-interactive window size		
	Width Height	1280 1024	
	Snapshots generation Generate record and replay snapshots		

Generate a Snapshot of the Error