Testimony - Release Notes

2.21 — Last update: 2020/02/28

Basis Technologies

Table of Contents

Introduction

Testimony v2.21 was released in February 2020.

Previous releases of Testimony are detailed in separate Release Notes:

- **Testimony v2.20** (Released November 2019)
- **Testimony v2.13** (Released June 2019)
- **Testimony v2.12** (Released May 2019)
- **Testimony v2.11** (Released April 2019)
- **Testimony v2.10** (Released February 2019)
- **Testimony v2.09** (Released January 2019)
- **Testimony v2.08** (Released December 2018)
- **Testimony v2.07** (Released November 2018)
- **Testimony v2.06** (Released October 2018) – **Interim Release Only**
- **Testimony v2.05** (Released October 2018)
- **Testimony v2.04** (Released October 2018)
- **Testimony v2.03** (Released September 2018) – **Interim Release Only**
- **Testimony v2.02** (Released September 2018) – **Interim Release Only**
- **Testimony v2.01** (Released September 2018) – **Interim Release Only**
- **Testimony v2.00** (Released August 2018)

SAP Certification

Testimony is a SAP certified solution:

- Certified for deployment on SAP NetWeaver 7.50 via the SAP integration scenario ABAP Add-On Deployment for SAP NetWeaver (**SAP report 12649**)
- Certified for deployment on SAP S/4HANA 1709 via the SAP integration scenario ABAP Add-On Deployment for SAP S/4HANA (**SAP report 12657**)
- SAP Solution Manager Ready functionality

All Testimony SAP components exist within Basis Technologies' own namespace **/BTI/**.

General Enhancements

This section describes the general enhancements that have been delivered in Testimony v2.21.

The key areas described in this section are:

- **Configuration parameters** – New parameters added in this release
- **Check steps** – This includes new check steps that have been introduced in this release including enhancements to existing check steps
- **User preference configuration** – New default user preference configuration
- **Exclusion configuration** – Describes the new entries added to the default filter set containing defaulted exclusion entries
- **Enhancements** – Changes to the enhancements in both recording and playback

Configuration Parameters

A number of new parameters have been added in this release of Testimony:

Parameter Name	Area	Description
BOT_MEM_THRESHOLD	Bot agent	During the playback, the bot will consume memory as it executes various transactions. Other measures have been put in place in v2.21 in order to stabilise the bot during playback, but this parameter controls at what point the bot should clean up all unused windows and if still below this threshold, force the execution queue into a "paused" state. For the operator, this is an opportunity to add more bots into the playback if deemed necessary. This value should not exceed 1Gb (1000) and should not be below 500Mb (500)
DRONE_REFRESH_TIME	Bot agent	During the playback, various monitoring information is obtained from the bots to support the most optimal performance. On a regular basis, the bots are polled to gather information such as memory consumption and number of SAP GUI windows they have open. This parameter controls how regularly this is done and must be traded off with network latency when making a call to the bot to retrieve this information.
INV_SCR_VER	Playback	A new version of the investigate screen is now available within v2.21. It is activated by default. This parameter allows you to revert back to the previous version of the investigate screen if required.
BATCH_EVALUATION	Playback	During the playback of batch jobs in testimony, the job logs from the recording are compared to the job logs from the playback. This is a very strict comparison and the same messages must be output in the same sequence and if not, a failure is output. However, often batch jobs work upon different datasets in the playback than in the recording. This can lead to failures that are false negatives. This parameter controls options on performing this comparison in a more intelligent manner.
BATCH_USER_TYPE	Playback	When batch jobs are submitted during the playback, issues have arisen in the past where the original batch job schedluer no longer exists in the system. The job can run under a different user, which is why this is not seen as an issue in the production system. This parameter controls how Testimony handles this scenario.
ROOT_CAUSE	Playback	This parameter controls whether the new "Root Cause Analysis" functionality is active or not. The default for this parameter is deactivated, hence if you would like to use the new root cause analysis functionality you must first activate this parameter (after appropriate pre-requisites are met).
SCREEN_RES_HEIGHT	Playback	When setting up the bots for use in the playback, the screen

		resolutions must be sufficient to support the users in the recording. Lower resolutions mean that the correct resizing of the screen may not be possible by the bot and thus the screens may behave differently during the playback. The minimum recommended screen resolution height is 1080. This parameter can be increased if deemed necessary. It is used in the playback check step of the bot cofiguration and outputs a warning if any bots have a resolution height less than this parameter.
SCREEN_RES_WIDTH	Playback	This parameter works in conjunction with the previously described parameter SCREEN_RES_HEIGHT.
CLOSE_SES_THRESHOLD	Playback	This parameter is one of the most critical delivered in v2.21 of Testimony. In order to keep the bots participating in the playback stable, they must ensure their RAM usage is kept as low as possible for the duration of the playback. They achieve this in v2.21 by closing down windows as often as possible. The trade-off is that users need to be logged back on and this has a slight performance impact. To keep this impact as minimal as possible, this parameter is the “number of steps” that are analyzed ahead in the playback to see if the same user has another script coming up. If they do, then the bot is instructed to keep the window open rather than logging off the user and then having to log them back on. If your number of bots are at a minimum, then you should keep this parameter as low as possible and ideally set to 0. Thus, all transactions will require a login, an execution of a script/transaction and then a logoff, thus keeping memory consumption on the bots to a minimum.
PLAYBACK_CHK_IDOC_SG	Playback	An early version of both inbound and outbound IDoc capture and replay is introduced in v2.21. Testimony can be activated to capture all IDoc’s created during the recording and then during the playback, compare that the same IDoc’s are also generated. Certain fields upon the IDoc control records are compared but the data segment comparison can be controlled via this parameter. Since IDoc segments may contain data that differs during the playback (e.g. time fields, GUID’s or unique identifiers. Turn this off to not perform the data comparison or use the new configuration table in IDoc data comparisons to exclude the fields which will typically always be different between recording and playback.
PLAYBACK_CHK_SSF_OTF	Playback	An early version of SAP Script form capture and replay is introduced in v2.21. Testimony can be activated to capture all SAP Script Forms that are generated during the recording and then during the playback, compare that the same forms are also generated. The form headers are compared during the playback, however, it is also possible to compare the underlying OTF data that is generated in the form. This data is unstructured (mostly) and therefore may contain fields that will almost always be different in the playback compared to the recording (e.g. times, unique identifiers). Hence, this parameter can be used to deactivate this OTF data comparison if desired. Note that you can now also configure the “windows” for exclusion in the OTF data comparison to ensure unique fields are

		not compared in the playback.
PLAYBACK_GET_SPOOL	Playback	Version 2.21 of Testimony now allows you to capture the spool request output during both the recording and the playback phases of Testimony. This parameter controls whether this data is retrieved or not during both the recording and playback phases.
SPOOL_RETENTION_PER	Archiving	Version 2.21 now retrieves the spool output from batch jobs that are captured in both the recording and the playback. This parameter controls how long those spool outputs are retained for as the spool data is copied from the source and target systems into the central system. The default value is ‘9’ which means to retain them indefinitely. A value from 1-8 is also possible which specifies that the spools should only be kept for that many days.
SPOOL_OUTPUT_DEVICE	Archiving	This parameter controls which spool output device should be specified when the spool is copied from the source (or target) system into the central system. This is required because the output devices configured on the central system may differ from those on the source or target. If blank is specified here, then the original value from the remote system will be used when creating the spool in the central system. This will fail if the output device does not exist.

✻ **Important note**: Since release v2.20 of Testimony, an upgrade to this version will no longer over-write your general parameters.

Check steps

The following check steps have been created or changed in this release:

Check Step	Phase	Type	Description
IDoc configuration retrieval	Recording	Post Data Transfer	In versions 2.21 of Testimony, both inbound and outbound IDoc's can be captured during the recording and compared in the playback. In order to faciltate this comparison, the remote IDoc definitions must be retrieved from the source and target systems. After capturing IDoc's in the recording, this post data transfer step will retrieve the IDoc related configuration that supports in the IDoc comparison.
IDoc configuration retrieval	Playback	Preparation	Since the configuration of IDoc's may have been changed in the target system as a part of the tested changes, this step will retrieve the IDoc configuration from the target system prior to the playback starting. This data is then used to support the IDoc validation of the IDoc's .
Generate Playback Summary	Playback	Post Processing	Once a playback has completed successfully, the playback summary will now be automatically generated.
Retrieve Batch Job Spools	Playback	Post Processing	Once a playback has completed successfully, the batch job spools will all be automatically retrieved from the playback system so that the investigation of batch job failures is supported by the analysis of the recording versus playback batch job spool output.
Bot Configuration Check	Playback	Check Step	The check on the bot configuration has been significantly enhanced. Additional checks are now done on the following – (1) Correct theme is set, (2) SAP GUI History is turned off, (3) Bot executable has been authorised for the new visual theme, (4) Bot screen resolution is sufficient.

Playback system parameters

The following profile parameters have been added during the playback check step:

Profile Parameter	Check performed
login/ disable_multi_gui_login	In most production landscapes, it is not possible to have the same user logged on more than once. In the playback test landscape, this option must be deactivated so that the bots can be logged on more than once with the same user (if required). This is a sequencing issue managed by the playback, but this check is to ensure that entire scripts are not cancelled because the bot was unable to login as the specified user since it was already logged on by the same (or another) bot.

User Preference Configuration

The following user preference configuration has been added or amended to the configuration tables in order to more accurately capture this data during the recording and restore during the playback. Please review these entries and check if any custom configuration entries should be added (for example for Y/Z transactions that store and use user-specific settings).

Transaction	Configuration Table
MB51	ESDUS
ME21N	ESDUS
ME22N	ESDUS
ME23N	ESDUS
ME29N	ESDUS
ME51N	ESDUS
ME52N	ESDUS
ME53N	ESDUS
MEPO	ESDUS
MIGO	ESDUS
MIRO	ESDUS
PA30	LTDX
PPO1	LTDX
PPO2	LTDX
PPO3	LTDX
PPO4	LTDX
PPO5	LTDX
PPO6	LTDX
PPOC	LTDX
PPOCA	LTDX
PPOCE	LTDX
PPOCW	LTDX
PPOC_OLD	LTDX

PPOM	LTDX
PPOMA	LTDX
PPOME	LTDX
PPOMW	LTDX
PPOM_OLD	LTDX
PPOS	LTDX
PPOSA	LTDX
PPOSE	LTDX
PPOSW	LTDX
PPOS_OLD	LTDX

Important: All user preferences are configured in the central system only. The two important tables are **/BTI/AUT_C_USPA** and **/BTI/AUT_C_USPR**.

Exclusion Configuration

The default values delivered in v2.21 for the exclusion configuration in Filter Sets have been enhanced.

There are now approximately **250 objects** in the default configuration for exclusions with batch jobs, dialog transactions, inbound RFC's and inbound web-services. Please review these entries prior to starting the process and ensure that you agree on the configured entries.

> ✻ Don't forget you can always over-ride the standard delivered filter set and configure your own. This can also be done after reviewing the usage data from transaction ST03 or STAD. However, you can also do this configuration after a recording in the "Performance Analysis" area of Testimony.

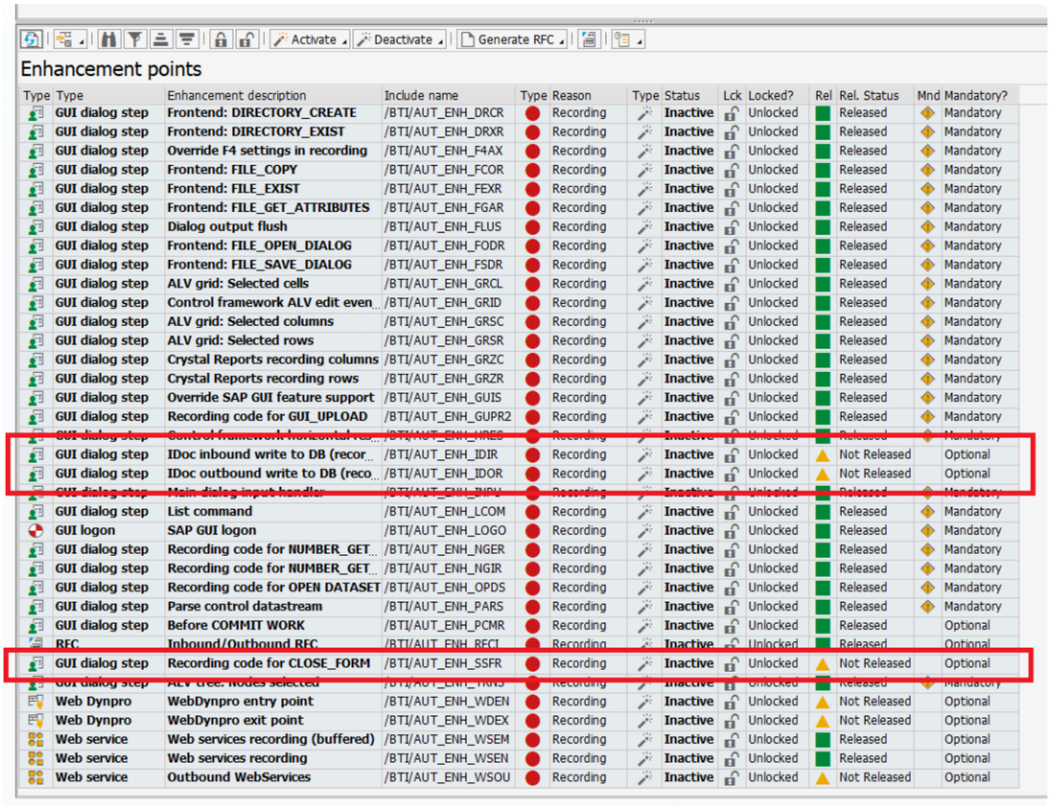
Enhancements

Recording Enhancements

A number of changes have been made to the enhancement setup for recording. There are three new recording enhancements that are in early release in v2.21:

1. **Inbound IDoc Capture** – records any generated inbound IDoc's that occur during the recording
2. **Outbound IDoc Capture** – records any generated outbond IDoc's that occur during the recording
3. **SAP Script Form Capture** – records any generated SAP script forms that occur during the recording

All 3 enhancements are available in ramp-up mode in v2.21. Therefore, to trial these you must first unlock them and activate them manually when you activate the others:



Enhancement points

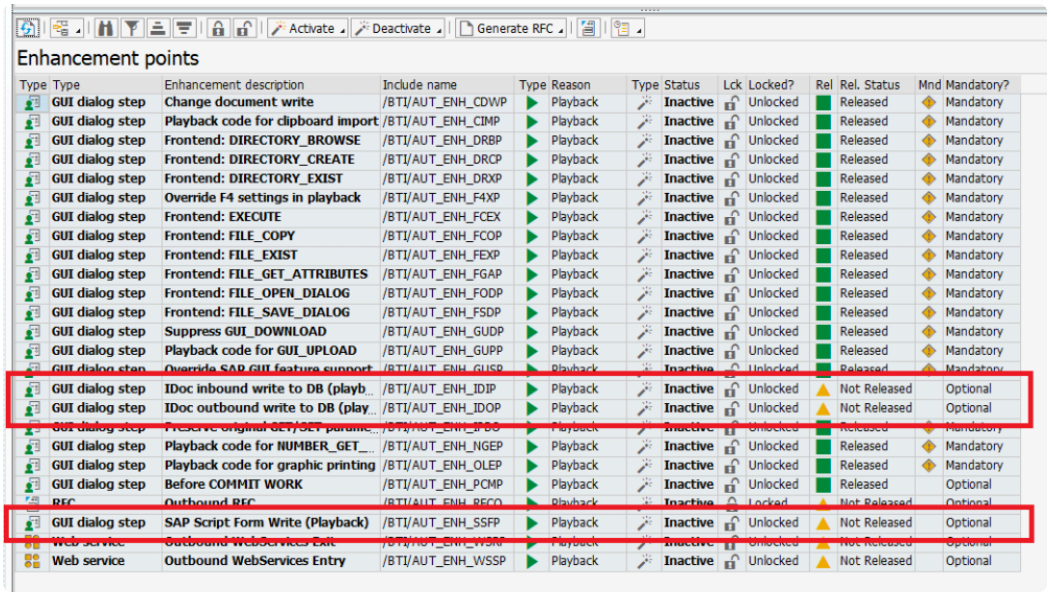
Type	Type	Enhancement description	Include name	Type	Reason	Type	Status	Lck	Locked?	Rel	Rel. Status	Mnd	Mandatory?
	GUI dialog step	Frontend: DIRECTORY_CREATE	/BTI/AUT_ENH_DRCR	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: DIRECTORY_EXIST	/BTI/AUT_ENH_DRXR	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Override F4 settings in recording	/BTI/AUT_ENH_F4AX	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: FILE_COPY	/BTI/AUT_ENH_FCOR	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: FILE_EXIST	/BTI/AUT_ENH_FEXR	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: FILE_GET_ATTRIBUTES	/BTI/AUT_ENH_FGAR	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Dialog output flush	/BTI/AUT_ENH_FLUS	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: FILE_OPEN_DIALOG	/BTI/AUT_ENH_FODR	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: FILE_SAVE_DIALOG	/BTI/AUT_ENH_FSDR	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	ALV grid: Selected cells	/BTI/AUT_ENH_GRCL	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Control framework ALV edit even...	/BTI/AUT_ENH_GRID	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	ALV grid: Selected columns	/BTI/AUT_ENH_GRSC	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	ALV grid: Selected rows	/BTI/AUT_ENH_GRSR	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Crystal Reports recording columns	/BTI/AUT_ENH_GRZC	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Crystal Reports recording rows	/BTI/AUT_ENH_GRZR	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Override SAP GUI feature support	/BTI/AUT_ENH_GUIS	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Recording code for GUI_UPLOAD	/BTI/AUT_ENH_GUPR2	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Control framework horizontal res...	/BTI/AUT_ENH_HRES	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	IDoc inbound write to DB (recor...	/BTI/AUT_ENH_IDIR	●	Recording		Inactive		Unlocked	▲	Not Released		Optional
	GUI dialog step	IDoc outbound write to DB (reco...	/BTI/AUT_ENH_IDOR	●	Recording		Inactive		Unlocked	▲	Not Released		Optional
	GUI dialog step	Main dialog input handler	/BTI/AUT_ENH_INPU	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	List command	/BTI/AUT_ENH_LCOM	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI logon	SAP GUI logon	/BTI/AUT_ENH_LOGO	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Recording code for NUMBER_GET...	/BTI/AUT_ENH_NGER	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Recording code for NUMBER_GET...	/BTI/AUT_ENH_NGIR	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Recording code for OPEN DATASET	/BTI/AUT_ENH_OPDS	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Parse control datastream	/BTI/AUT_ENH_PARS	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Before COMMIT WORK	/BTI/AUT_ENH_PCMR	●	Recording		Inactive		Unlocked	🟩	Released		Optional
	RFC	Inbound/Outbound RFC	/BTI/AUT_ENH_RFCI	●	Recording		Inactive		Unlocked	🟩	Released		Optional
	GUI dialog step	Recording code for CLOSE_FORM	/BTI/AUT_ENH_SSFR	●	Recording		Inactive		Unlocked	▲	Not Released		Optional
	GUI dialog step	ALV tree: Nodes selected	/BTI/AUT_ENH_TRNS	●	Recording		Inactive		Unlocked	🟩	Released	◆	Mandatory
	Web Dynpro	WebDynpro entry point	/BTI/AUT_ENH_WDEN	●	Recording		Inactive		Unlocked	▲	Not Released		Optional
	Web Dynpro	WebDynpro exit point	/BTI/AUT_ENH_WDEX	●	Recording		Inactive		Unlocked	▲	Not Released		Optional
	Web service	Web services recording (buffered)	/BTI/AUT_ENH_WSEM	●	Recording		Inactive		Unlocked	🟩	Released		Optional
	Web service	Web services recording	/BTI/AUT_ENH_WSEN	●	Recording		Inactive		Unlocked	🟩	Released		Optional
	Web service	Outbound WebServices	/BTI/AUT_ENH_WSOU	●	Recording		Inactive		Unlocked	▲	Not Released		Optional

New recording enhancements in v2.21

> ! If your recording system does not have the related enhancement points compiled, you may need to update the navigation indexes for these 3 enhancement points. They are in the programs **SAPLEDIR**, **SAPLEDI2** and **SAPLSTXC** respectively.

Playback Enhancements

The equivalent playback enhancements are now required to be turned on during the playback to capture inbound IDoc's, outbound IDoc's and SAP Script Forms.



Enhancement points

Type	Type	Enhancement description	Include name	Type	Reason	Type	Status	Lck	Locked?	Rel	Rel. Status	Mnd	Mandatory?
	GUI dialog step	Change document write	/BTI/AUT_ENH_CDWP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Playback code for clipboard import	/BTI/AUT_ENH_CIMP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: DIRECTORY_BROWSE	/BTI/AUT_ENH_DRBP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: DIRECTORY_CREATE	/BTI/AUT_ENH_DRCP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: DIRECTORY_EXIST	/BTI/AUT_ENH_DRXP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Override F4 settings in playback	/BTI/AUT_ENH_F4XP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: EXECUTE	/BTI/AUT_ENH_FCEX	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: FILE_COPY	/BTI/AUT_ENH_FCOP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: FILE_EXIST	/BTI/AUT_ENH_FEXP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: FILE_GET_ATTRIBUTES	/BTI/AUT_ENH_FGAP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: FILE_OPEN_DIALOG	/BTI/AUT_ENH_FODP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Frontend: FILE_SAVE_DIALOG	/BTI/AUT_ENH_FSDP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Suppress GUI_DOWNLOAD	/BTI/AUT_ENH_GUDP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Playback code for GUI_UPLOAD	/BTI/AUT_ENH_GUPP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Override SAP GUI feature support	/BTI/AUT_ENH_GUSP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	IDoc inbound write to DB (playb...	/BTI/AUT_ENH_IDIP	▶	Playback		Inactive		Unlocked	▲	Not Released		Optional
	GUI dialog step	IDoc outbound write to DB (play...	/BTI/AUT_ENH_IDOP	▶	Playback		Inactive		Unlocked	▲	Not Released		Optional
	GUI dialog step	Preserve original GET/SET parame...	/BTI/AUT_ENH_[illegible]	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Playback code for NUMBER_GET_...	/BTI/AUT_ENH_NGEP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Playback code for graphic printing	/BTI/AUT_ENH_OLEP	▶	Playback		Inactive		Unlocked	🟩	Released	◆	Mandatory
	GUI dialog step	Before COMMIT WORK	/BTI/AUT_ENH_PCMP	▶	Playback		Inactive		Unlocked	🟩	Released		Optional
	RFC	Outbound RFC	/BTI/AUT_ENH_RFCO	▶	Playback		Inactive		Locked	▲	Not Released		Optional
	GUI dialog step	SAP Script Form Write (Playback)	/BTI/AUT_ENH_SSFP	▶	Playback		Inactive		Unlocked	▲	Not Released		Optional
	Web service	Outbound WebServices Exit	/BTI/AUT_ENH_WSRP	▶	Playback		Inactive		Unlocked	▲	Not Released		Optional
	Web service	Outbound WebServices Entry	/BTI/AUT_ENH_WSSP	▶	Playback		Inactive		Unlocked	▲	Not Released		Optional

New playback enhancements in v2.21

! If the enhancement points do not activate immediately, then the same 3 programs as per the recording may need their navigation indexes updated.

Key Enhancements

The key areas that have been enhanced in v2.21 are listed below:

- **Root Cause Analysis** – Identificaties which underlying changes/transports caused differences in the playback
- **Bot Session Management** – Better management of SAP GUI sessions to save bots becoming unstable during the playback
- **Bot / Script Load Distribution** – New algorithm for determining which bot to allocate new user sessions to during the playback
- **Investigation Screen Extensions** – Significant changes to enhance user experience in the investigation screen of a failure
- **SAP Script Forms** – Early release of SAP Script form recording and playback validation
- **IDoc Deep Validation** – Early release of inbound/outbound IDoc recording and playback validation
- **Pre-playback simulation** – Early simulation of the playback process before an execution queue
- **Outbound RFC Analysis** – Analyzes the outbound RFC usage in the production system based upon the usage data

Root Cause Analysis

One of the major key enhancements delivered in v2.21 is known as **Root Cause Analysis** (RCA for the remainder of this document).

The business meaning for this functionality is that once a difference is detected by Testimony in the playback, this new functionality of RCA can be leveraged to understand what change (or changes) might have caused it to happen in the first place. RCA provides the test team with a flash-light into understanding whether a change has been made in the area affected, who changed it and why.

The final result of the RCA is provided to the user at the defect level. If changes are made to any area beneath the object that has been found to have a failure, then these are highlighted as transport requests that are potential root causes of the failure.

> ✻ You must install the certified ABAP add-on “ActiveControl” (AC) in order to leverage the capabilities introduced in RCA. You do not need to configure AC in any way, but it must have been installed into both your central system and target system prior to activating RCA functionality.

Sample Business Scenario

A company runs SAP ECC and sells their products to end customers. The **order to cash** business process is a fundamental part of their business operations.

A regulatory change is required to increase sales tax. An appropriate **change request** is created for the SAP team to implement the required customizing and this is done in a **transport request**.

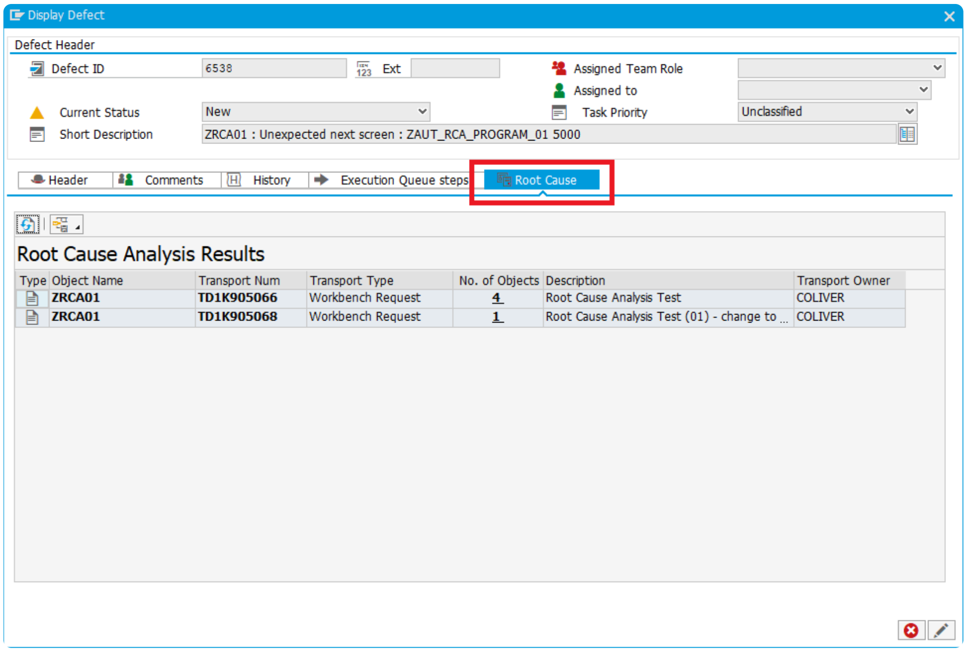
After **recording** the customers production system and capturing various OTC related functions, these transactions are readied for play back into the test system. The test system has been **copied** from production at the time of the recording.

The changes for the sales tax increase are bundled in with other changes requested by the business.

A **build list** was created in Testimony representing the changes that have been made as a part of the release, including the sales tax customising request.

During the play back, the **transaction VA01** identifies a difference in 10% of the 500 instances of that transaction.

After running the defect proposal and the Root Cause Analysis program, the test team member goes into the defect that has been generated for investigation. Within the “Root Cause” tab of the defect, they can immediately see the changes relating to the sales tax customizing request that may be the underlying caused the underlying root cause of the failure.



Defect Header

Defect ID	6538	Assigned Team Role	
Ext		Assigned to	
Current Status	New	Task Priority	Unclassified
Short Description	ZRCA01 : Unexpected next screen : ZAUT_RCA_PROGRAM_01 5000		

Root Cause Analysis Results

Type	Object Name	Transport Num	Transport Type	No. of Objects	Description	Transport Owner
	ZRCA01	**TD1K905066**	Workbench Request	4	Root Cause Analysis Test	COLIVER
	ZRCA01	**TD1K905068**	Workbench Request	1	Root Cause Analysis Test (01) - change to ...	COLIVER

Defect display of root cause analysis

Setup Process

In order to fully setup and configure RCA for use, please use the following set of steps:

Installation of Active Control

Whilst there are no direct technical dependencies between AC and Testimony, the RCA functionality will not function correctly without AC installed. It does not require any configuration, it simply needs to exist as an installed add-on to the central and target systems.

Deep Impact linkage creation

After AC has been installed into the target system, the linkages program must be run within this system. This may be done prior to the playback. It could even be done in the source system first and then be copied over to the target system. Do not forget you'll need Diffuser license keys to run the linkage program which will be provided during implementation of Testimony.

Root Cause Analysis parameter

This parameter must be activated in the general parameters section in the central system. Without it activated, you will not see the following:

- The tab "Root Cause" in the display of a defect
- The button in "Playback Overview" to run "Root cause analysis"
- The tab in "Playback Overview" that shows you the results of overall RCA run

Build list creation

A build list represents the "release" or set of changes that are being regression tested with Testimony. It can be automatically populated from the transports deployed to the target system since the recording started. The build list contains the list of objects that have been changed upon each transport request.

! If you do not see the "**Build Lists**" option in the Testimony "**Execution**" menu, then you may not be in the right User Interface Profile. In v2.21, this menu item is available to those users in the "**Test Engineer**" delivered UI profile.

Run Defect proposal

You should run the defect proposal process after a playback is finished in order to generate the defects at an aggregate level to the failures. RCA related data can be viewed as an overall outcome once it has been run, however, users who are routed defects should be able to view the underlying root causes of those defects when they are assigned and analyzed.

Run Root Cause Analysis

Assuming all of the previous steps have been successfully processed, then it is finally time to process all defects and attempt to find the underlying changes that may have caused those failed objects.

Review Output

There are three ways in which to see the results of running the root cause analysis.

1. **Review overall root cause anlaysis output** – This can be navtigated to via the Result Overview and the “Root Cause” tab for the selected queue. All data that has been derived by Root Cause Analysis can be seen within this area so you’ll know whether underlying root causes have been identified or not.
2. **Within the defect management diplay** – If you navigate to the defect management grid, you will see all defects that have been generated by the defect proposal run. A new flag has been added (also available as a filter option) to show whether a given defect has one or more related root causes.
3. **Within a particular defect** – If you select a particular defect that has one or more root causes identified for it, then these will be visible in the “Root Cause” tab for that defect. If no root causes are found then this grid will be empty (or invisible).

Bot Load Distribution Algorithm

A new algorithm has been introduced to increase the stability of the bots during playback. The limiting factor is a hard limit in the SAP GUI Script API whereby if the SAP GUI windows use up more than 1Gb of RAM, then this causes the bots to become unstable. For playbacks, this could cause the bots to become unresponsive or simply crash which resulted in technical errors and current scripts failing.

Previous Method

The previous method available from version 2.20 of Testimony saw SAP GUI dialog sessions being distributed based upon the **number of SAP GUI windows** that were open. The bot with the least number of SAP GUI windows open would be selected to run the next user session. However, we now know that memory is the limiting factor (not number of windows).

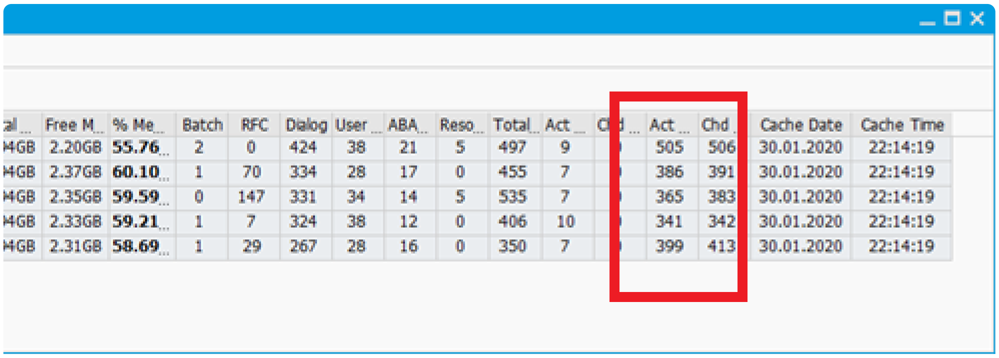
New Method

The allocation of a new SAP GUI logon session is now determined dynamically by selecting the bot with the **lowest** memory consumption.

Impact

There is now a full understanding that each bot can have a maximum memory utilization of between 1.0Gb and 1.1Gb. This is a hard limit within the SAP GUI scripting API. If the bot goes above this, then it either becomes unresponsive or completely crashes. This new technique of selecting the bot with the least amount of memory consumption will ensure the bots remain as stable as possible during the playback processing.

✻ The bot monitoring popup window, available from the playback monitoring section of Testimony, now provides information on how much memory a given bot is consuming at any point in time.



al ...	Free M...	% Me...	Batch	RFC	Dialog	User ...	ABA...	Reso...	Total...	Act ...	Chd ...	Act ...	Chd ...	Cache Date	Cache Time
4GB	2.20GB	**55.76...**	2	0	424	38	21	5	497	9	[illegible]	505	506	30.01.2020	22:14:19
4GB	2.37GB	**60.10...**	1	70	334	28	17	0	455	7	[illegible]	386	391	30.01.2020	22:14:19
4GB	2.35GB	**59.59...**	0	147	331	34	14	5	535	7	[illegible]	365	383	30.01.2020	22:14:19
4GB	2.33GB	**59.21...**	1	7	324	38	12	0	406	10	[illegible]	341	342	30.01.2020	22:14:19
4GB	2.31GB	**58.69...**	1	29	267	28	16	0	350	7	[illegible]	399	413	30.01.2020	22:14:19

Bot memory consumption is now available

Bot Session Management

As described in the previous section on the new load distribution algorithm, the critical limits are the memory consumed by the SAP GUI scripting API that is leveraged within the bot executable. This sections describes how release v2.21 provides additional protection mechanisms to ensure that the bots remain even more stable during the playback.

Key Issues to be solved

Bots are crashing after being overloaded with too many SAP GUI sessions / windows. Even with smart load distribution based upon memory consumption, it is possible that the bots still crash as certain transactions/ scripts consume much more memory than others.

Solutions for resolution

There are two new techniques used in v2.21 (described in the following sub-sections) to support achieving this:

1. Reducing the number of open/active SAP GUI windows during playback
2. Pausing the bots when they reach a critical memory threshold

Bot Window Management

New Technique for bot window management

In order to reduce the memory requirements on the bot during the playback, a new concept has been introduced. SAP GUI windows, once test scripts have been executed, are shut down automatically if there is no “soon to be run” scripts for that same user session. This means that the bot will login the user, run the script, then shut-down the window thus freeing up the memory consumed.

> ✻ This also means that when monitoring the playback, you should see very few windows upon the bots that aren’t doing anything.

The problem with constantly closing down the SAP GUI windows is that this impacts performance since the next script that the user runs will need to log back on every time for every script. Thus, a new parameter has been created to optimize the performance of the playback.

The new changes mean that windows will be shut down on a regular basis based upon a new parameter (**CLOSE_SES_THRESHOLD**). As each script is allocated to a worker thread, this parameter is retrieved and the playback will look **N steps** ahead to see if the same user session is in those next set of steps. If they aren’t, then the bot/worker thread is instructed that after it completes the script, it should automatically shut down the window/session.

Impact of reducing the windows upon each bot

Bots should remain stable throughout the playback and won’t crash by running out of memory. Less bots are therefore required for a playback. You should not see as many “idle” windows on the bots during the playback. If you have very few bots in your playback, then the value for CLOSE_SES_THRESHOLD should be kept to a minimum (ideally 0). A value of 0 means that all scripts will shut down their windows at the end of each script. It also means that there will need to be a login for every script.

The optimal value for CLOSE_SES_THRESHOLD when many bots are involved in the playback, is somewhere between 1000 and 5000 dependent upon the execution queue size and the number of bots involved. Please liaise with Basis Technologies delivery and support when deciding upon this value for your playback.

! Don’t forget that scripts that have dependencies upon other scripts may only partially run (e.g. run up to step 10 out of 30) and then wait until the dependent script is completed. Thus, you may still see SAP GUI windows open but waiting. Also, if a user opens multiple sessions (e.g. 2+ SAP GUI windows in parallel), then the bot will need to open these additional windows as well which may do nothing until the parallel script is complete.

Bot Critical Memory Threshold

New Technique for monitoring bot memory

A new concept has been introduced in v2.21 in order to monitor the “critical memory threshold” of the bot. When this critical memory threshold is reached, the bot will automatically attempt to close all “non-essential” SAP GUI windows. If the memory is still above this threshold, then the queue will be automatically paused.

New bot memory general parameter

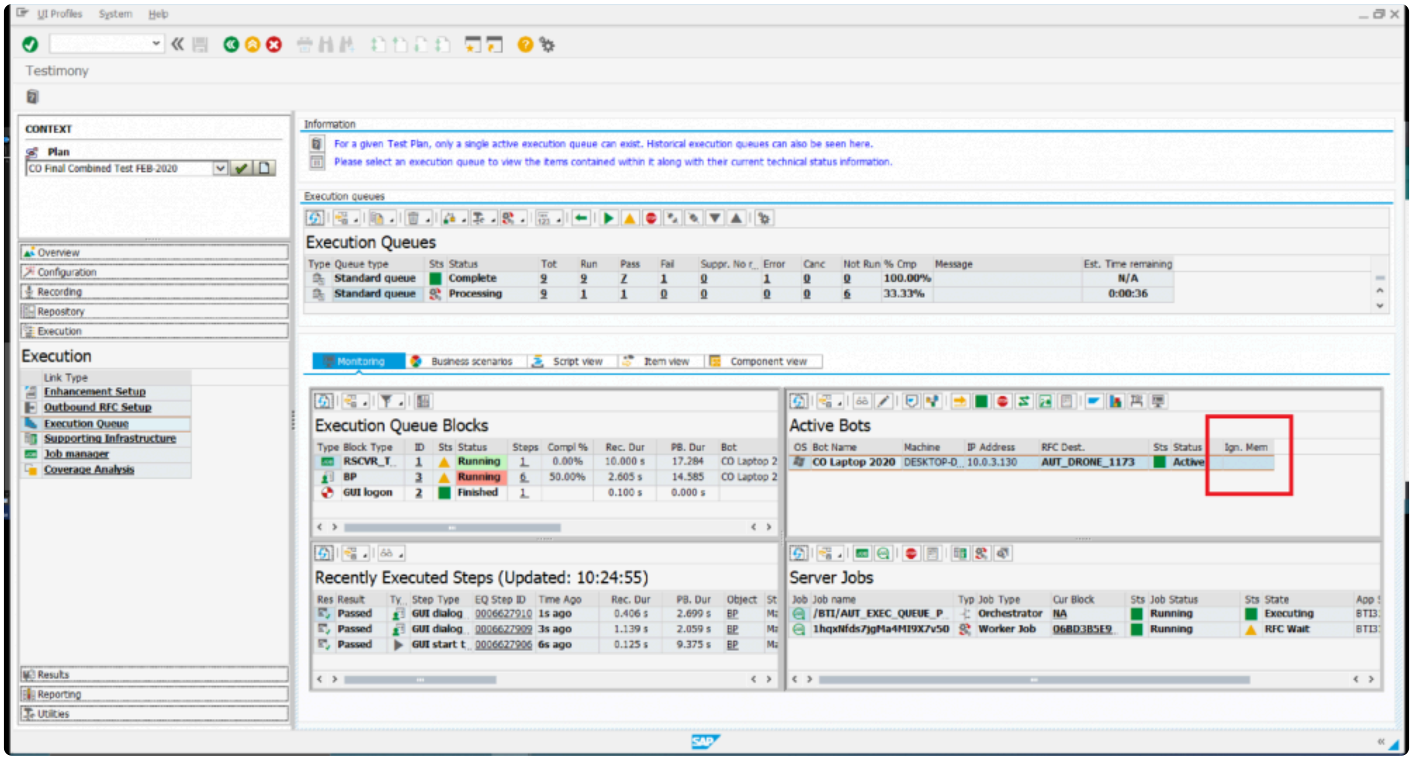
There is now a new bot “general parameter” that specifies this critical memory threshold. The parameter name is “**BOT_MEM_THRESHOLD**” and the default value for this is 900 (Mb).

What happens if this critical threshold is reached?

As mentioned previously, if this threshold is reached and remains after the attempt to close down windows, the execution queue will automatically pause. This presents the opportunity for the operator to add in more bots to the queue if required. Adding in new bots to the playback “on the fly” is also new functionality available in Testimony v2.21. You simply start up another bot machine connected to the central system. You will then see it appear in the “Active Bots” of the playback monitoring. You can then “connect” the bot using the normal button to do this. After that the queue can be resumed.

> ✻ When a bot reaches the critical memory threshold, the queue is automatically paused. However, you can still continue the playback once you have observed that everything with the bot is ok (e.g. the number of windows is minimal). The bot that reached its critical threshold is marked with a flag to indicate that it has already reached its threshold. That bot will thus be ignored going forward in the assessment of whether to pause the queue even though it may be above the memory threshold.

If you would like the queue paused again if that particuar bot (or others) have their threshold reached again, then you need to remove this “ignore flag” from “Active Bots” grid in the playback monitoring. This is shown in the screen-shot below. The field is a hot-spot which must be clicked for the required bot and the flag will then be removed.



Information

For a given Test Plan, only a single active execution queue can exist. Historical execution queues can also be seen here.
Please select an execution queue to view the items contained within it along with their current technical status information.

Execution queues

Execution Queues

Type	Queue type	Sts	Status	Tot	Run	Pass	Fail	Suppr. No r...	Error	Canc	Not Run	% Cmp	Message	Est. Time remaining
	Standard queue	🟩	Complete	9	9	7	1	0	1	0	0	100.00%		N/A
	Standard queue		Processing	9	1	1	0	0	0	0	6	33.33%		0:00:36

Execution Queue Blocks

Type	Block Type	ID	Sts	Status	Steps	Compl %	Rec. Dur	PB. Dur	Bot
	RSCVR_T...	1	▲	Running	1	0.00%	10.000 s	17.284	CO Laptop 2
	BP	3	▲	Running	6	50.00%	2.605 s	14.585	CO Laptop 2
	GUI logon	2	🟩	Finished	1		0.100 s	0.000 s	

Active Bots

OS	Bot Name	Machine	IP Address	RFC Dest.	Sts	Status	Ign. Mem
	CO Laptop 2020	DESKTOP-D...	10.0.3.130	AUT_DRONE_1173	🟩	Active	

Recently Executed Steps (Updated: 10:24:55)

Res	Result	Ty...	Step Type	EQ Step ID	Time Ago	Rec. Dur	PB. Dur	Object	St
	Passed		GUI dialog	0006627910	1s ago	0.406 s	2.699 s	BP	Ma
	Passed		GUI dialog	0006627909	3s ago	1.139 s	2.059 s	BP	Ma
	Passed	▶	GUI start t...	0006627906	6s ago	0.125 s	9.375 s	BP	Ma

Server Jobs

Job	Job name	Typ	Job Type	Cur Block	Sts	Job Status	Sts	State	App ...
	/BTI/AUT_EXEC_QUEUE_P...		Orchestrator	NA	🟩	Running	🟩	Executing	BTI3...
	1hqxNfds7jgMa4MI9X7v50		Worker Job	06BD3B5E9...	🟩	Running	▲	RFC Wait	BTI3...

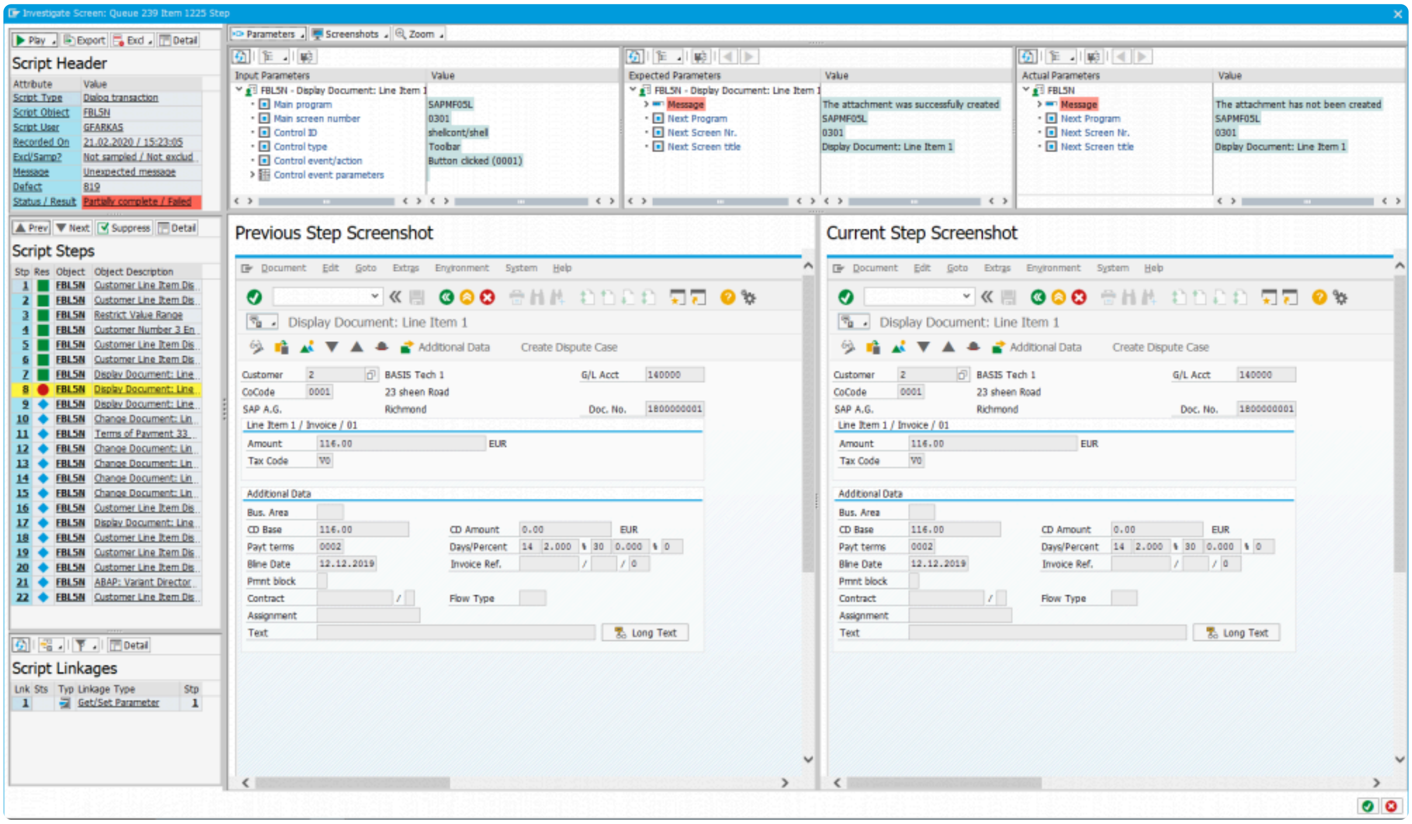
Memory Threshold Ignore Flag

Additional notes

Since playbacks of certain transactions take up more memory than others, we have ensured that the bots will navigate back to the start transaction at the end of each script. Effectively, the bot performs a “/N” transaction once the script is completed, thus freeing up any additional memory that may be in use by the current transaction.

Investigation Screen Extensions

The investigate screen in v2.21 has had a complete overhaul in order to provide significantly more information to users as they investigate script failures. An example of the new screen is shown below:



Investigate Screen: Queue 239 Item 1225 Step

Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	FBL5N
Script User	GFARKAS
Recorded On	21.02.2020 / 15:23:05
Excl/Samp?	Not sampled / Not exclud
Message	Unexpected message
Defect	819
Status / Result	Partially complete / Failed

Script Steps

Stp	Res	Object	Object Description
1	🟩	FBL5N	Customer Line Item Dis
2	🟩	FBL5N	Customer Line Item Dis
3	🟩	FBL5N	Restrict Value Range
4	🟩	FBL5N	Customer Number 3 En
5	🟩	FBL5N	Customer Line Item Dis
6	🟩	FBL5N	Customer Line Item Dis
7	🟩	FBL5N	Display Document: Line
8	●	FBL5N	Display Document: Line
9	◆	FBL5N	Display Document: Line
10	◆	FBL5N	Change Document: Lin
11	◆	FBL5N	Terms of Payment 33
12	◆	FBL5N	Change Document: Lin
13	◆	FBL5N	Change Document: Lin
14	◆	FBL5N	Change Document: Lin
15	◆	FBL5N	Change Document: Lin
16	◆	FBL5N	Customer Line Item Dis
17	◆	FBL5N	Display Document: Line
18	◆	FBL5N	Customer Line Item Dis
19	◆	FBL5N	Customer Line Item Dis
20	◆	FBL5N	Customer Line Item Dis
21	◆	FBL5N	ABAP: Variant Director
22	◆	FBL5N	Customer Line Item Dis

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1

Input Parameters	Value
FBL5N - Display Document: Line Item 1	
Main program	SAPMF05L
Main screen number	0301
Control ID	shellcont/shell
Control type	Toolbar
Control event/action	Button clicked (0001)
Control event parameters	

Expected Parameters	Value
FBL5N - Display Document: Line Item 1	
Message	The attachment was successfully created
Next Program	SAPMF05L
Next Screen Nr.	0301
Next Screen title	Display Document: Line Item 1

Actual Parameters	Value
FBL5N	
Message	The attachment has not been created
Next Program	SAPMF05L
Next Screen Nr.	0301
Next Screen title	Display Document: Line Item 1

Previous Step Screenshot

Display Document: Line Item 1

Customer 2 BASIS Tech 1 G/L Acct 140000
CoCode 0001 23 sheen Road
SAP A.G. Richmond Doc. No. 1800000001

Line Item 1 / Invoice / 01

Amount 116.00 EUR
Tax Code V0

Additional Data

Bus. Area
CD Base 116.00 CD Amount 0.00 EUR
Payt terms 0002 Days/Percent 14 2.000 % 30 0.000 % 0
Bline Date 12.12.2019 Invoice Ref. / / 0
Pmnt block
Contract / Flow Type
Assignment
Text

Current Step Screenshot

Display Document: Line Item 1

Customer 2 BASIS Tech 1 G/L Acct 140000
CoCode 0001 23 sheen Road
SAP A.G. Richmond Doc. No. 1800000001

Line Item 1 / Invoice / 01

Amount 116.00 EUR
Tax Code V0

Additional Data

Bus. Area
CD Base 116.00 CD Amount 0.00 EUR
Payt terms 0002 Days/Percent 14 2.000 % 30 0.000 % 0
Bline Date 12.12.2019 Invoice Ref. / / 0
Pmnt block
Contract / Flow Type
Assignment
Text

Sample new investigate screen in v2.21

! It is possible to revert to the previous investigate screen if desired via a general parameter.

The investigate screen is broken up into the following sections:

- **Header information (top left)**
  The header information area now has extended information pertaining to the script that is being investigated. This additional information is described in the following section.

- **Script steps (left middle)**
  This part of the investigate screen has not changed too much in this release.

- **Related linkages (lower left)**
  All linkages that have been captured in the recording and are to be used during the playback are now displayed here. Each linkage can be selected and displayed and these various linkage types are now described in the later sub-sections.

- **Inputs, Expected Outputs and Actual Outputs**
  This is shown on the right hand side of the screen and will now vary dependent upon what type of object is being investigated. Also, this area will also be replaced if a linkage is selected for invsetigation. Each of the various object types and how they are now displayed are described in the following sub-sections.

✻ The following sub-sections describe the generic left hand sections followed by the new screens for the 4 key object types and then the 12 new screens for linkage types.

Script Level Screens

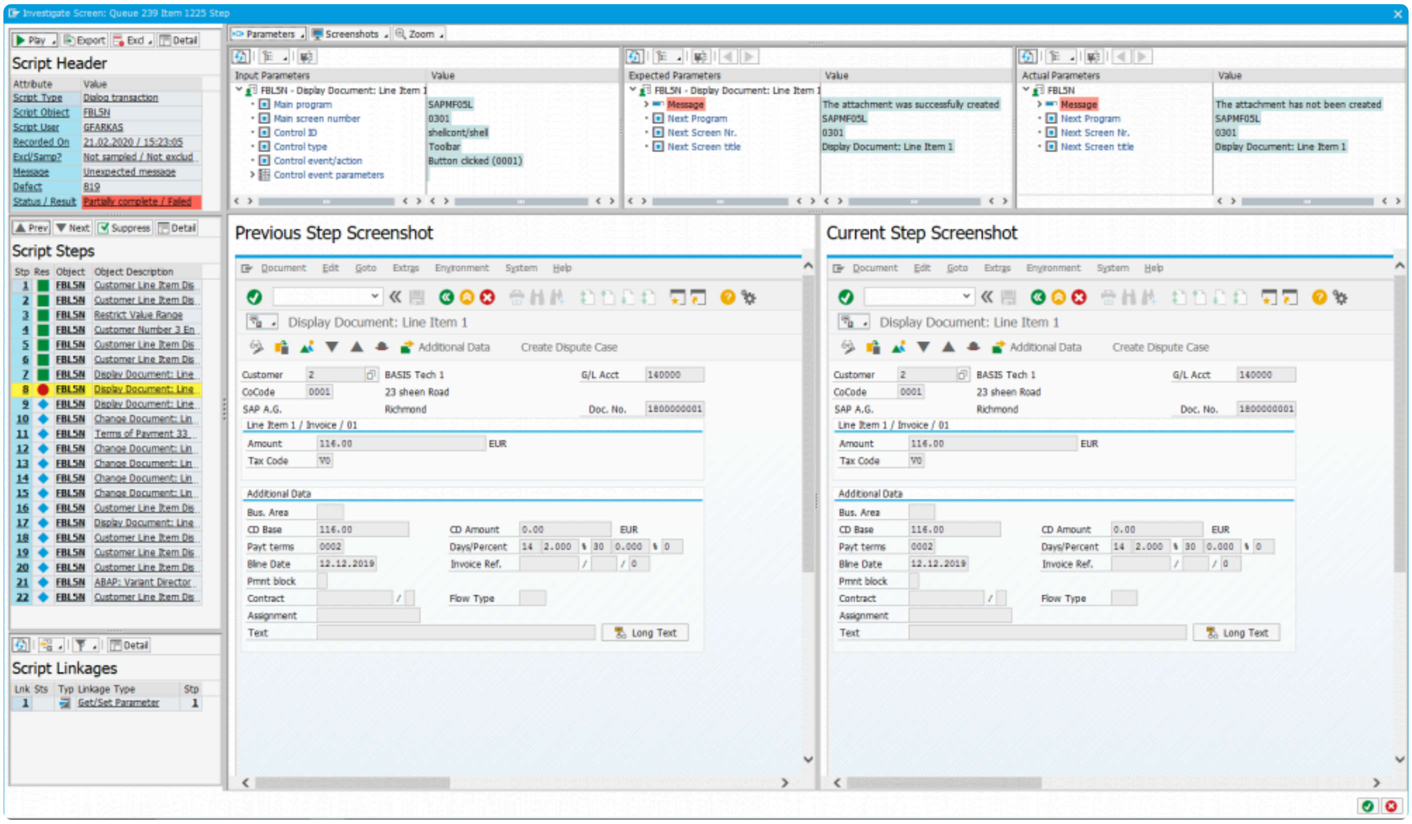
The following sections describe the changes to the investigate screen that are generic in nature. These are:

- **Header Section**
- **Script Steps**
- **Related Linkages**
- **Expected vs Actual**

Header Section

The following changes have now been implemented in v2.21 of Testimony to show significantly more details to the user when investigating a script failure.

An example of the new investigate screen is shown here:



Investigate Screen: Queue 239 Item 1225 Step

Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	FBL5N
Script User	GFARKAS
Recorded On	21.02.2020 / 15:23:05
Excl/Samp?	Not sampled / Not exclud
Message	Unexpected message
Defect	819
Status / Result	Partially complete / Failed

Script Steps

Stp	Res	Object	Object Description
1	🟩	FBL5N	Customer Line Item Dis
2	🟩	FBL5N	Customer Line Item Dis
3	🟩	FBL5N	Restrict Value Range
4	🟩	FBL5N	Customer Number 3 En
5	🟩	FBL5N	Customer Line Item Dis
6	🟩	FBL5N	Customer Line Item Dis
7	🟩	FBL5N	Display Document: Line
8	●	FBL5N	Display Document: Line
9	◆	FBL5N	Display Document: Line
10	◆	FBL5N	Change Document: Lin
11	◆	FBL5N	Terms of Payment 33
12	◆	FBL5N	Change Document: Lin
13	◆	FBL5N	Change Document: Lin
14	◆	FBL5N	Change Document: Lin
15	◆	FBL5N	Change Document: Lin
16	◆	FBL5N	Customer Line Item Dis
17	◆	FBL5N	Display Document: Line
18	◆	FBL5N	Customer Line Item Dis
19	◆	FBL5N	Customer Line Item Dis
20	◆	FBL5N	Customer Line Item Dis
21	◆	FBL5N	ABAP: Variant Director
22	◆	FBL5N	Customer Line Item Dis

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1

Input Parameters	Value
FBL5N - Display Document: Line Item 1	
Main program	SAPMF05L
Main screen number	0301
Control ID	shellcont/shell
Control type	Toolbar
Control event/action	Button clicked (0001)
Control event parameters	

Expected Parameters	Value
FBL5N - Display Document: Line Item 1	
Message	The attachment was successfully created
Next Program	SAPMF05L
Next Screen Nr.	0301
Next Screen title	Display Document: Line Item 1

Actual Parameters	Value
FBL5N	
Message	The attachment has not been created
Next Program	SAPMF05L
Next Screen Nr.	0301
Next Screen title	Display Document: Line Item 1

Previous Step Screenshot

Display Document: Line Item 1

Customer	2	BASIS Tech 1	G/L Acct	140000
CoCode	0001	23 sheen Road		
SAP A.G.		Richmond	Doc. No.	1800000001

Line Item 1 / Invoice / 01

Amount	116.00	EUR
Tax Code	V0	

Additional Data

Bus. Area			
CD Base	116.00	CD Amount	0.00 EUR
Payt terms	0002	Days/Percent	14 2.000 % 30 0.000 % 0
Bline Date	12.12.2019	Invoice Ref.	/ / 0
Pmnt block			
Contract	/	Flow Type	
Assignment			
Text			

Current Step Screenshot

Display Document: Line Item 1

Customer	2	BASIS Tech 1	G/L Acct	140000
CoCode	0001	23 sheen Road		
SAP A.G.		Richmond	Doc. No.	1800000001

Line Item 1 / Invoice / 01

Amount	116.00	EUR
Tax Code	V0	

Additional Data

Bus. Area			
CD Base	116.00	CD Amount	0.00 EUR
Payt terms	0002	Days/Percent	14 2.000 % 30 0.000 % 0
Bline Date	12.12.2019	Invoice Ref.	/ / 0
Pmnt block			
Contract	/	Flow Type	
Assignment			
Text			

Sample new investigate screen in v2.21

Queue Information

At the top of the investigate screen you can now see the execution queue ID and the item ID within that queue (within the window title). The format of the title is **"Investigate Screen: Queue X Item Y"**.

Header Information

The grid in the top left representing the Script Header contains key information relating to the script that is being investigated. These include:

- **Script Type** – The type of script that is being investigated (e.g. Dialog transaction)

- **Script Object** – The name of the object representing the script (e.g. transaction VA01)
- **Script User** – The user who executed the script in the playback system
- **Recorded On** – The date and time that the script was recorded
- **Excl/Samp** – Information on whether this object is excluded or sampled in any way in the filter set configuration
- **Message** – If there is a message relating to the script (e.g. the failure reason) then this is shown here
- **Defect** – If a defect has been generated for this script then the defect number is displayed here
- **Status / Result** – Display the overall status of the script and whether it passed or failed

Additionally, you can perform the following:

- **Display the related defect** – If a defect number is shown, by selecting the hot-spot the defect details will be displayed
- **Display the test script header** – By selecting any other hot-spot area in the grid, the test script header will be displayed

Toolbar Actions

Within the toolbar of the header, you can perform the following actions:

- **Export the data** – This requires you switching to the old investigate screen and then exporting the script data from there
- **Setup Exclusions** – If this object should be excluded or sampled going forward, you can add it directly from here
- **Details of test script** – In the same way that you can click on various hot-spots in the grid, you can also click here to display the test script header
- **Trigger playback remote control** – This lets you re-run the script, step by step, with a bot that needs to be started.

> ✻ Don’t forget you need to activate the playback enhancements before using the playback remote control!

Script Steps

The script steps section of the new investigate screen is similar to the previous version. There are some noticeable differences which are noted below:

Grid display

The icon for displaying whether a script step passed or failed is now the standard “LED” icon.

- **Green** – means that the step executed and passed
- **Red** – means that the step has failed (or was a techical error)
- **Yellow** – means that the step was cancelled
- **Inactive** – means that the step did not run

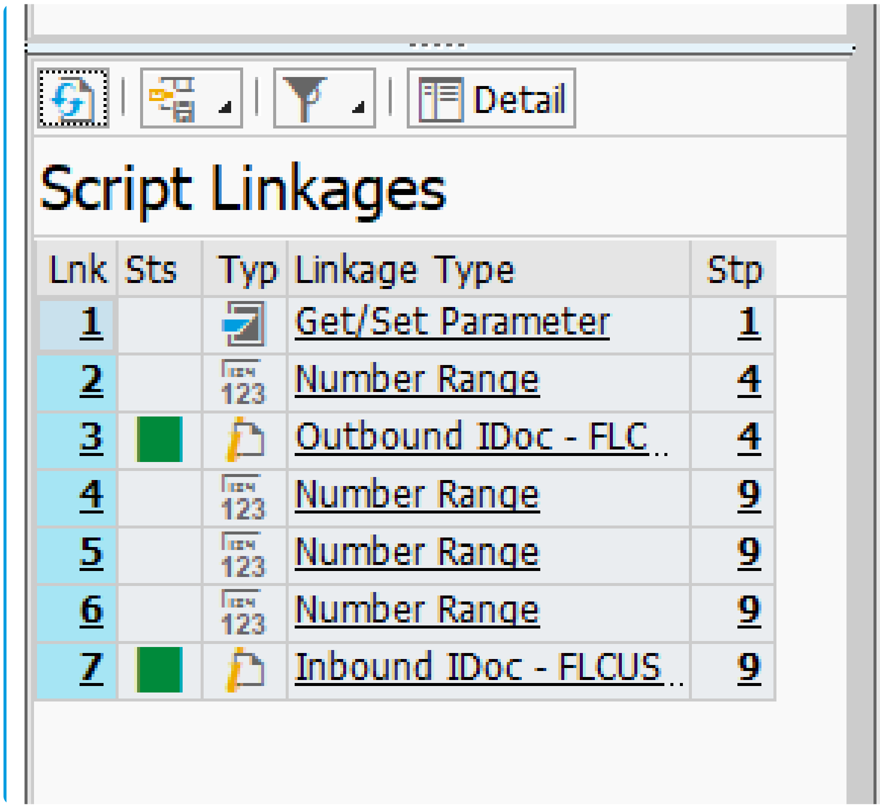
> ✻ A new key piece of functionality is that the currently selected step is now highlighted in yellow. The user is therefore given immediate context on which step is currently selected during their investigation.

Action toolbar

- **Prev/Next** – Navigates to the previous or next step from the currently selected one
- **Suppress** – Immediately allows you to configure suppressions for the currently selected step
- **Detail** – Displays the test script step popup window

Related Linkages

The previous version of the investigate screen did not provide visibility of the linkages for the script/steps that were being investigated by the user. This is now resolved in Testimony v2.21 and linkages are now shown in the lower left part of the screen, as per the screen-shot below:



Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2		123	Number Range	4
3	🟩		Outbound IDoc - FLC..	4
4		123	Number Range	9
5		123	Number Range	9
6		123	Number Range	9
7	🟩		Inbound IDoc - FLCUS..	9

List of linkges relating to the script

Linkage list

The following fields are shown in the grid:

- **Linkage Number** – A sequential number starting from 1 for each linkage in the script
- **Linkage Status** – If the linkage has been validated in any way (only relevant to change documents, IDoc’s and SAP Script Forms), then this will display the status of that linkage. If the linkage has passed, then this icon will be green. If it failed, it will show as red. If no validation has happened then this will be empty.
- **Linkage Type** – Shows the type of linkage that it is
- **Related Step** – Linkages are stored at the step level. When using the investigate screen, this is

shown at the script level. All linkages relating to all steps of the script will be shown and this field lets the user know which step the linkage specifically relates to.

Toolbar actions

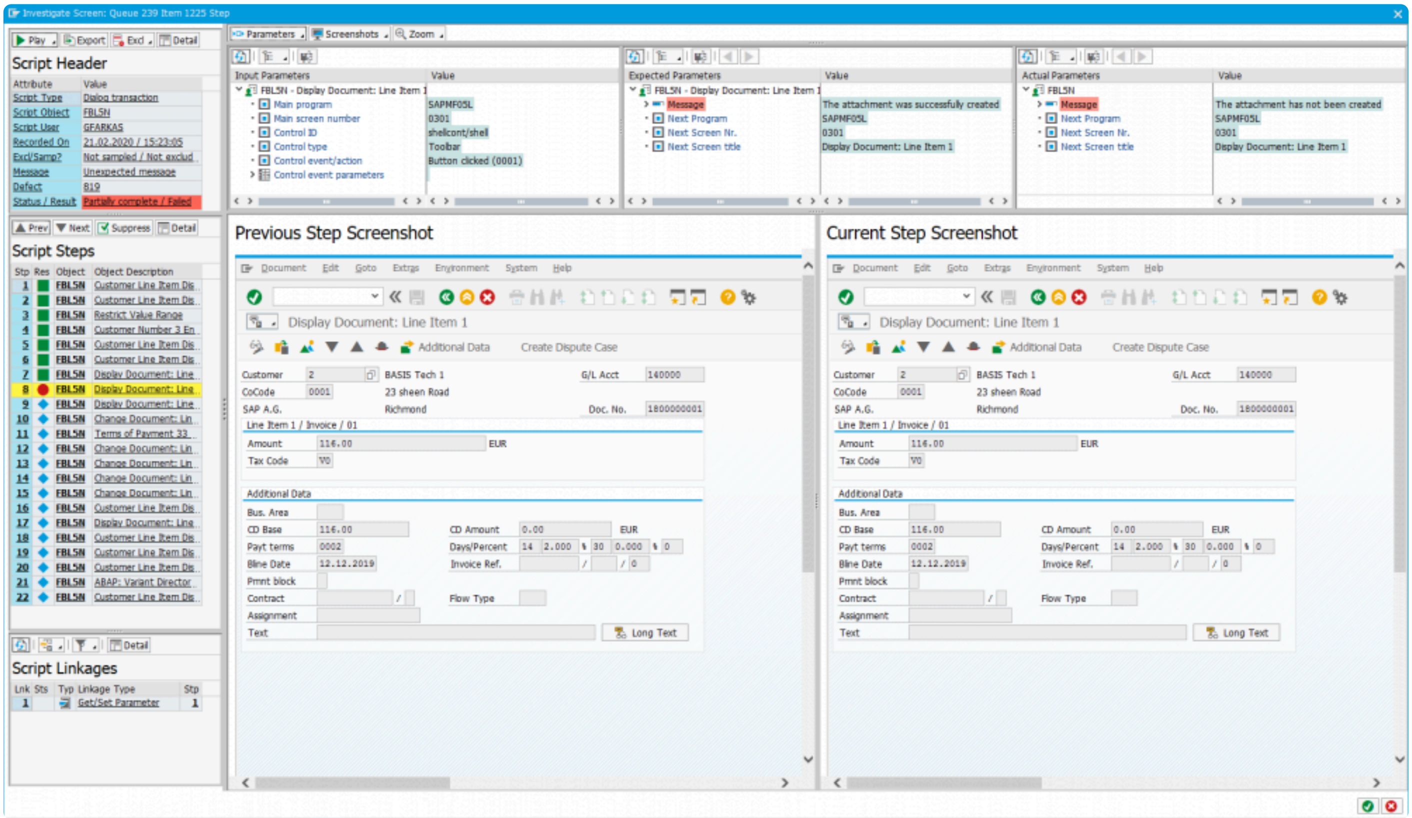
- **Filtering** – The filter options lets the user restrict the list of linkages shown by type or sub-type
- **Detail** – Internal details about the linkage can be shown by selecting the linkage first and the clicking "detail"
- **Linkage Selection** – If you select the hot-spot for a particular linkage, the linkage will be shown on the right hand side of the screen

p(banner tip).

✻ Like script step selection, if you select a linkage the row in the list will be high-lighted in yellow. This let's you immediately know which linkage you are currently investigating on the right hand side of the screen.

Expected vs Actual

The display of the inputs, expected outputs and the actual outputs was always available in the previous investigate screen, additional options are now available for your preference on how you would like these displayed. As per the previous version, the inputs to the step, expected outputs and actual outputs are displayed at the top of the screen, as seen in the screen-shot below.



Investigate Screen: Queue 239 Item 1225 Step

Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	FBL5N
Script User	GFARKAS
Recorded On	21.02.2020 / 15:23:05
Excl/Samp?	Not sampled / Not exclud...
Message	Unexpected message
Defect	819
Status / Result	Partially complete / Failed

Script Steps

Stp	Res	Object	Object Description
1	🟩	FBL5N	Customer Line Item Dis...
2	🟩	FBL5N	Customer Line Item Dis...
3	🟩	FBL5N	Restrict Value Range
4	🟩	FBL5N	Customer Number 3 En...
5	🟩	FBL5N	Customer Line Item Dis...
6	🟩	FBL5N	Customer Line Item Dis...
7	🟩	FBL5N	Display Document: Line...
8	●	FBL5N	Display Document: Line...
9	◆	FBL5N	Display Document: Line...
10	◆	FBL5N	Change Document: Lin...
11	◆	FBL5N	Terms of Payment 33 ...
12	◆	FBL5N	Change Document: Lin...
13	◆	FBL5N	Change Document: Lin...
14	◆	FBL5N	Change Document: Lin...
15	◆	FBL5N	Change Document: Lin...
16	◆	FBL5N	Customer Line Item Dis...
17	◆	FBL5N	Display Document: Line...
18	◆	FBL5N	Customer Line Item Dis...
19	◆	FBL5N	Customer Line Item Dis...
20	◆	FBL5N	Customer Line Item Dis...
21	◆	FBL5N	ABAP: Variant Director...
22	◆	FBL5N	Customer Line Item Dis...

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1

Input Parameters	Value
FBL5N - Display Document: Line Item 1	
Main program	SAPMF05L
Main screen number	0301
Control ID	shellcont/shell
Control type	Toolbar
Control event/action	Button clicked (0001)
Control event parameters	

Expected Parameters	Value
FBL5N - Display Document: Line Item 1	
Message	The attachment was successfully created
Next Program	SAPMF05L
Next Screen Nr.	0301
Next Screen title	Display Document: Line Item 1

Actual Parameters	Value
FBL5N	
Message	The attachment has not been created
Next Program	SAPMF05L
Next Screen Nr.	0301
Next Screen title	Display Document: Line Item 1

Previous Step Screenshot

Display Document: Line Item 1

Customer 2 BASIS Tech 1 G/L Acct 140000
CoCode 0001 23 sheen Road
SAP A.G. Richmond Doc. No. 1800000001

Line Item 1 / Invoice / 01
Amount 116.00 EUR
Tax Code V0

Additional Data
Bus. Area
CD Base 116.00 CD Amount 0.00 EUR
Payt terms 0002 Days/Percent 14 2.000 % 30 0.000 % 0
Bline Date 12.12.2019 Invoice Ref. / / 0
Pmnt block
Contract / Flow Type
Assignment
Text

Current Step Screenshot

Display Document: Line Item 1

Customer 2 BASIS Tech 1 G/L Acct 140000
CoCode 0001 23 sheen Road
SAP A.G. Richmond Doc. No. 1800000001

Line Item 1 / Invoice / 01
Amount 116.00 EUR
Tax Code V0

Additional Data
Bus. Area
CD Base 116.00 CD Amount 0.00 EUR
Payt terms 0002 Days/Percent 14 2.000 % 30 0.000 % 0
Bline Date 12.12.2019 Invoice Ref. / / 0
Pmnt block
Contract / Flow Type
Assignment
Text

Sample new investigate screen in v2.21

You are now able to change which of the 3 options are displayed and in what combination, as per the options listed below:

- **None** – No inputs/outputs are displayed at all
- **Inputs / Expected** – Only the inputs and expected outputs are displayed
- **Inputs / Actual** – Only the inputs and the actual outputs are displayed
- **Expected / Actual** – No inputs are displayed and only the expected and actual outputs are shown
- **Inputs / Expected / Actual** – This is the default setting – show all 3 inputs/outputs

✻ If you change these windows, your preference is immediately saved against your user and the object type you are currently displaying. This means you can have different layouts for the different object types (e.g. one layout for dialog transactions and another for batch jobs).

Script Type Screens

There are 4 main object types which all now have their own specific investigation screen:

- **Dialog Transactions**
  Explains the key changes relating to the new investigate screen for dialog transaction investigation.

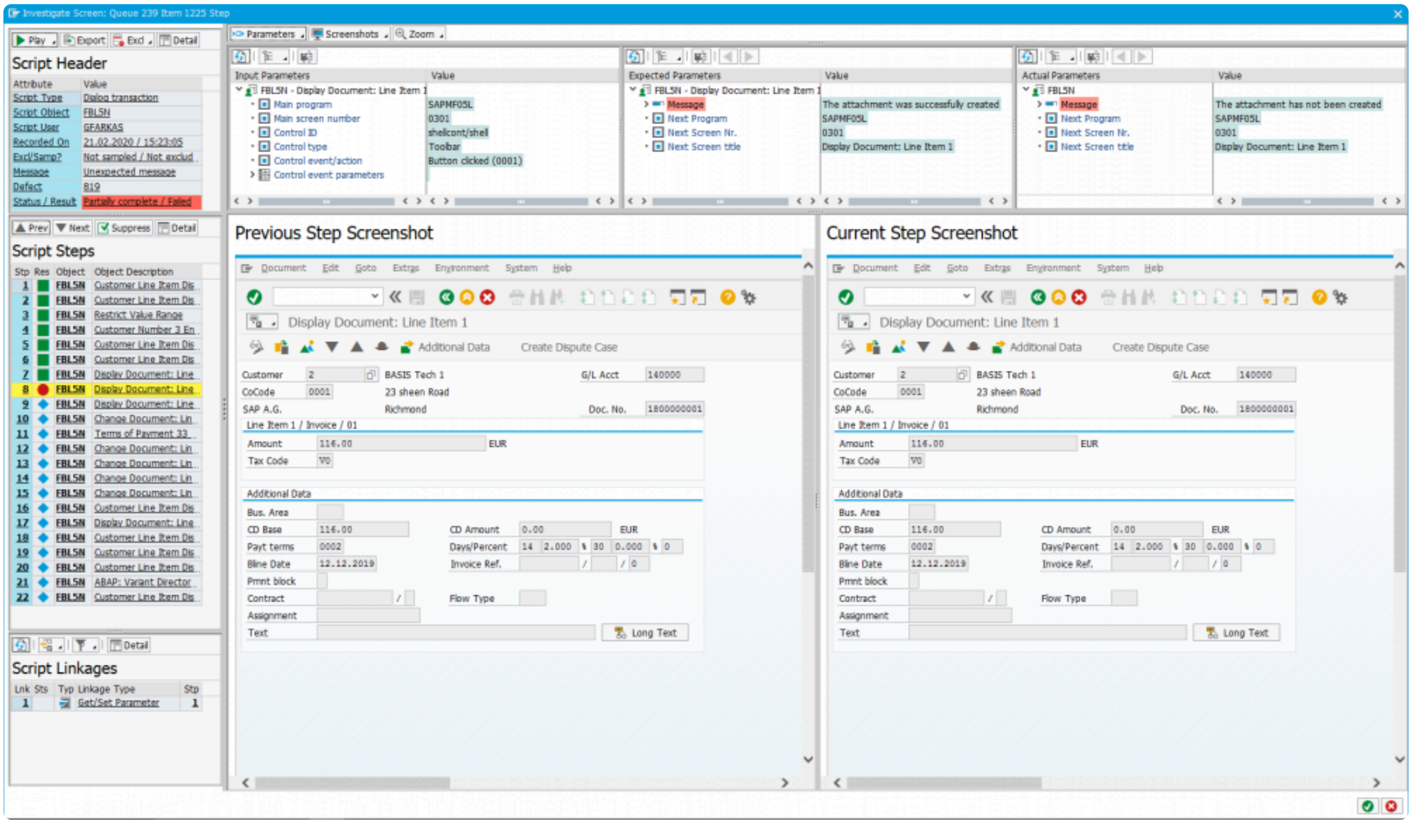
- **Batch Jobs**
  Explains the key changes relating to the new investigate screen for batch transaction investigation.

- **Inbound RFC**
  Explains the key changes relating to the new investigate screen for inbound RFC transaction investigation.

- **Inbound Web-services**
  Explains the key changes relating to the new investigate screen for inbound web-service transaction investigation.

Dialog Transactions

An example of the new dialog transaction investigate screen is shown below:



Investigate Screen: Queue 239 Item 1225 Step

Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	FBL5N
Script User	GFARKAS
Recorded On	21.02.2020 / 15:23:05
Excl/Samp?	Not sampled / Not exclud
Message	Unexpected message
Defect	819
Status / Result	Partially complete / Failed

Script Steps

Stp	Res	Object	Object Description
1	🟩	FBL5N	Customer Line Item Dis
2	🟩	FBL5N	Customer Line Item Dis
3	🟩	FBL5N	Restrict Value Range
4	🟩	FBL5N	Customer Number 3 En
5	🟩	FBL5N	Customer Line Item Dis
6	🟩	FBL5N	Customer Line Item Dis
7	🟩	FBL5N	Display Document: Line
8	●	FBL5N	Display Document: Line
9	◆	FBL5N	Display Document: Line
10	◆	FBL5N	Change Document: Lin
11	◆	FBL5N	Terms of Payment 33
12	◆	FBL5N	Change Document: Lin
13	◆	FBL5N	Change Document: Lin
14	◆	FBL5N	Change Document: Lin
15	◆	FBL5N	Change Document: Lin
16	◆	FBL5N	Customer Line Item Dis
17	◆	FBL5N	Display Document: Line
18	◆	FBL5N	Customer Line Item Dis
19	◆	FBL5N	Customer Line Item Dis
20	◆	FBL5N	Customer Line Item Dis
21	◆	FBL5N	ABAP: Variant Director
22	◆	FBL5N	Customer Line Item Dis

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1

Input Parameters	Value
FBL5N - Display Document: Line Item 1	
Main program	SAPMF05L
Main screen number	0301
Control ID	shellcont/shell
Control type	Toolbar
Control event/action	Button clicked (0001)
Control event parameters	

Expected Parameters	Value
FBL5N - Display Document: Line Item 1	
Message	The attachment was successfully created
Next Program	SAPMF05L
Next Screen Nr.	0301
Next Screen title	Display Document: Line Item 1

Actual Parameters	Value
FBL5N	
Message	The attachment has not been created
Next Program	SAPMF05L
Next Screen Nr.	0301
Next Screen title	Display Document: Line Item 1

Previous Step Screenshot

Display Document: Line Item 1

Customer	2	BASIS Tech 1		G/L Acct	140000			
CoCode	0001	23 sheen Road						
SAP A.G.		Richmond		Doc. No.	1800000001			

Line Item 1 / Invoice / 01

Amount	116.00	EUR
Tax Code	V0	

Additional Data

Bus. Area			
CD Base	116.00	CD Amount	0.00 EUR
Payt terms	0002	Days/Percent	14 2.000 % 30 0.000 % 0
Bline Date	12.12.2019	Invoice Ref.	/ / 0
Pmnt block			
Contract	/	Flow Type	
Assignment			
Text			

Current Step Screenshot

Display Document: Line Item 1

Customer	2	BASIS Tech 1		G/L Acct	140000			
CoCode	0001	23 sheen Road						
SAP A.G.		Richmond		Doc. No.	1800000001			

Line Item 1 / Invoice / 01

Amount	116.00	EUR
Tax Code	V0	

Additional Data

Bus. Area			
CD Base	116.00	CD Amount	0.00 EUR
Payt terms	0002	Days/Percent	14 2.000 % 30 0.000 % 0
Bline Date	12.12.2019	Invoice Ref.	/ / 0
Pmnt block			
Contract	/	Flow Type	
Assignment			
Text			

Sample new investigate screen in v2.21

Key changes in the new version

The key changes to the investigate screen for dialog transactions are:

Screen-shots

You can now display the previous steps screen-shot and the current steps screen-shot at the same time in the right hand side of the screen. Alternatively, you can view the previous screen shot or the current screen shot (after) alone.

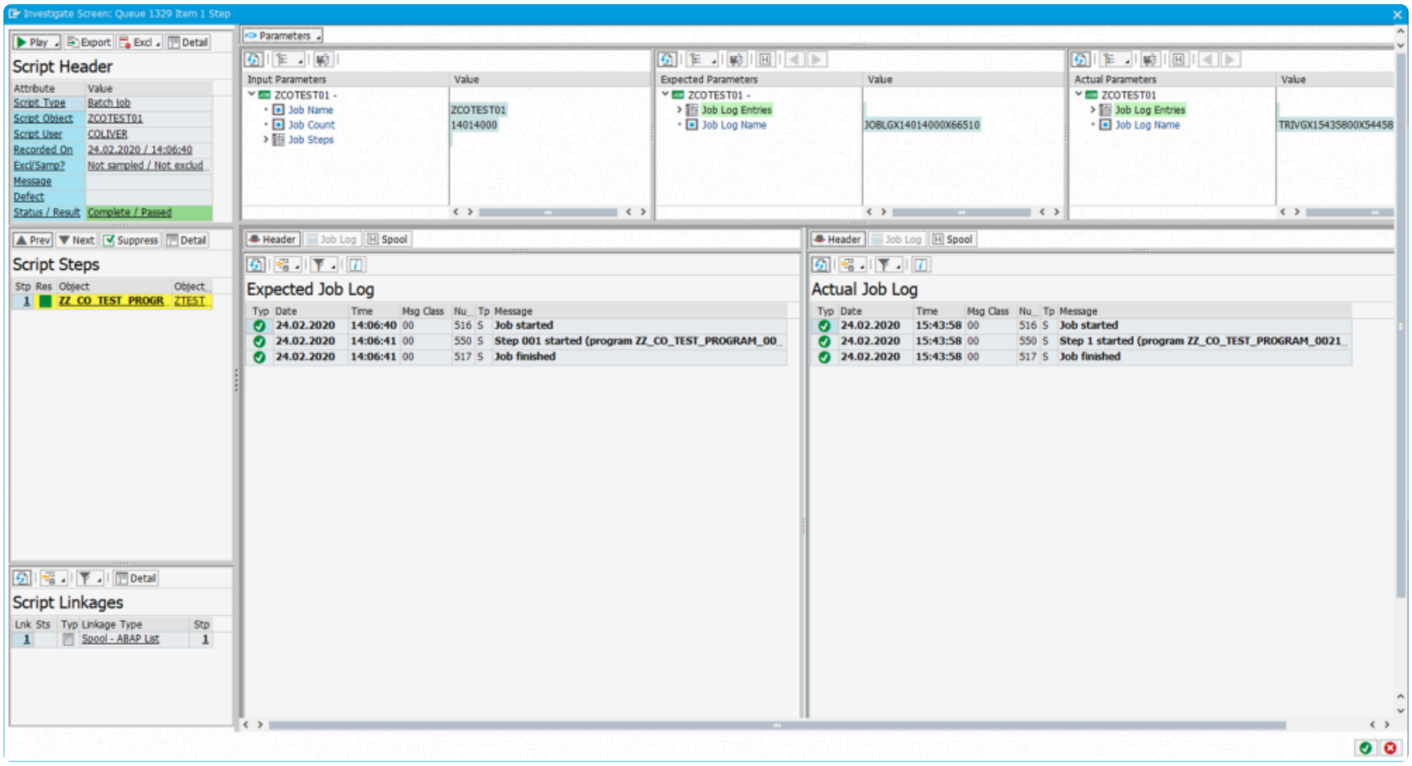
Screen-shot zooming

It is now possible to zoom in or zoom out dynamically for the screen-shot (or screen-shots) by a % factor. The options are 25%, 50%, 75%, 100% or 200%.

Zooming requires your central system to be on a certain kernel / support pack level. It also requires the RFC destination **IGS_RFC_DEST** to be configured correctly. Ensure the registered server program ID is set correctly – “IGS.“.

Batch Jobs

An example of the new batch job investigate screen is shown below:



Investigate Screen: Queue 1329 Item 1 Step

Script Header

Attribute	Value
Script Type	Batch job
Script Object	ZCOTEST01
Script User	COLIVER
Recorded On	24.02.2020 / 14:06:40
Excl/Samp?	Not sampled / Not exclud…
Message	
Defect	
Status / Result	Complete / Passed

Input Parameters	Value
ZCOTEST01 -	
Job Name	ZCOTEST01
Job Count	14014000
Job Steps	

Expected Parameters	Value
ZCOTEST01 -	
Job Log Entries	
Job Log Name	JOBLGX14014000X66510

Actual Parameters	Value
ZCOTEST01	
Job Log Entries	
Job Log Name	TRIVGX15435800X54458

Script Steps

Stp	Res	Object	Object…
1	🟩	ZZ_CO_TEST_PROGR…	ZTEST…

Expected Job Log

Typ	Date	Time	Msg Class	Nu…	Tp	Message
✓	24.02.2020	14:06:40	00	516	S	Job started
✓	24.02.2020	14:06:41	00	550	S	Step 001 started (program ZZ_CO_TEST_PROGRAM_00…
✓	24.02.2020	14:06:41	00	517	S	Job finished

Actual Job Log

Typ	Date	Time	Msg Class	Nu…	Tp	Message
✓	24.02.2020	15:43:58	00	516	S	Job started
✓	24.02.2020	15:43:58	00	550	S	Step 1 started (program ZZ_CO_TEST_PROGRAM_0021…
✓	24.02.2020	15:43:58	00	517	S	Job finished

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Spool - ABAP List	1

Batch job investigate screen

Key changes in the new version

The key changes to the investigate screen for batch jobs are:

Screen-shots

The screen real-estate that was used up for screen-shots has been removed.

Multi-step batch jobs

If a batch job has multiple steps defined, then each step will be shown in the “Script Steps” grid and each step can be selected.

Batch job log

The logs of the batch job are now displayed in a grid which can be filtered by message class and message type. Note that batch job logs are common for all steps if the batch job has more than one step in its definition.

Batch job header

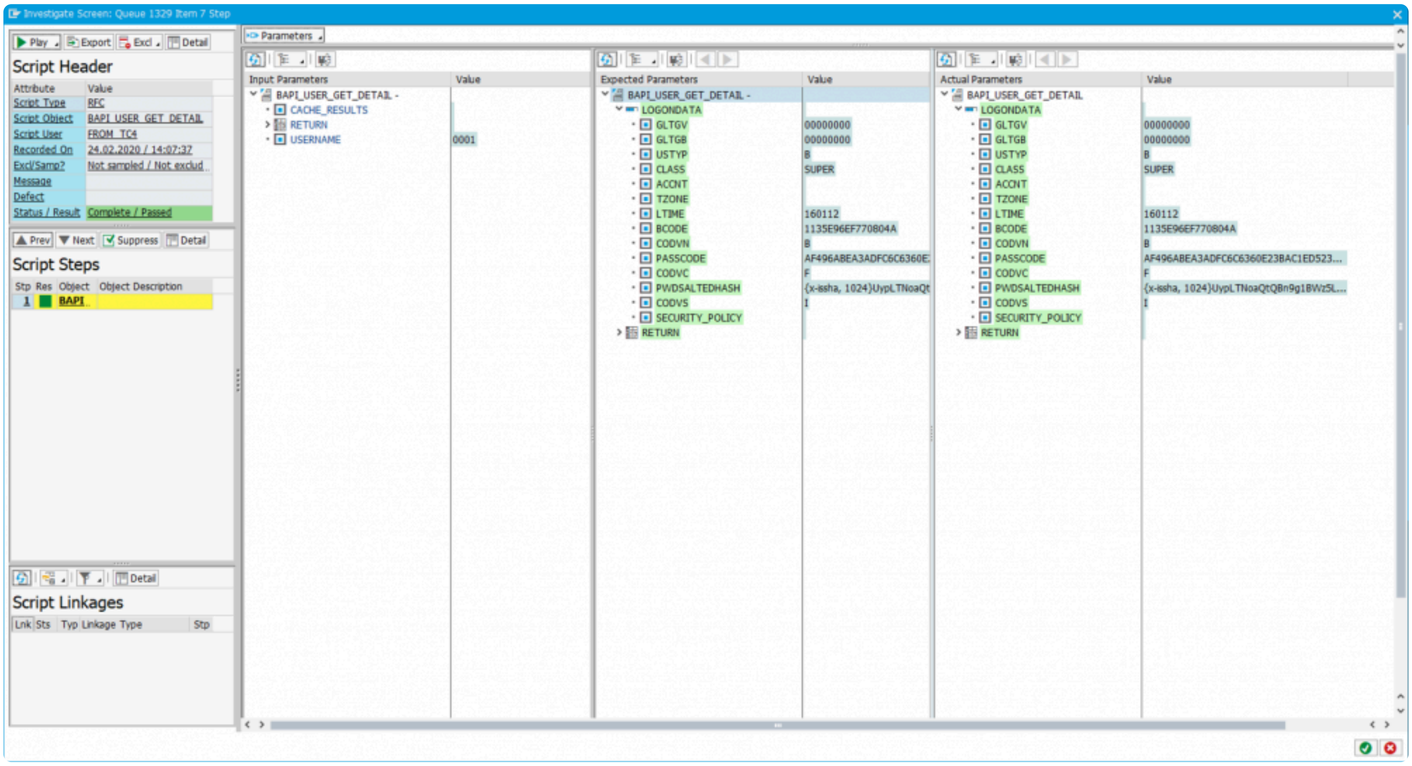
The header definition of the batch job step is available in the “Header”. This contains information such as when the batch job was scheduled to run in the recording and when it ran in the playback. For multi-step batch jobs, you can select each step and the header is specific to that step.

Batch job spool

Version 2.21 now captures the spool during the recording and the playback. You will not be able to see the spool output until the playback is finished completely as the spool contents are retrieved during a post-processing step. Similarly, the batch job spools are not retrieved until the recording is switched off. Spool content is currently not compared between the recording and playback. They are there to support the user in their investigation on batch job failures.

Inbound RFC

An example of the new inbound RFC investigate screen is shown below:



Script Header

Attribute	Value
Script Type	RFC
Script Object	BAPI_USER_GET_DETAIL
Script User	FROM_TC4
Recorded On	24.02.2020 / 14:07:37
Excl/Samp?	Not sampled / Not exclud...
Message	
Defect	
Status / Result	Complete / Passed

Script Steps

Stp	Res	Object	Object Description
1	🟩	BAPI...	

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp

Input Parameters	Value
BAPI_USER_GET_DETAIL -	
CACHE_RESULTS	
RETURN	
USERNAME	0001

Expected Parameters	Value
BAPI_USER_GET_DETAIL -	
LOGONDATA	
GLTGV	00000000
GLTGB	00000000
USTYP	B
CLASS	SUPER
ACCNT	
TZONE	
LTIME	160112
BCODE	1135E96EF770804A
CODVN	B
PASSCODE	AF496ABEA3ADFC6C6360E
CODVC	F
PWDSALTEDHASH	{x-issha, 1024}UypLTNoaQt
CODVS	I
SECURITY_POLICY	
RETURN	

Actual Parameters	Value
BAPI_USER_GET_DETAIL	
LOGONDATA	
GLTGV	00000000
GLTGB	00000000
USTYP	B
CLASS	SUPER
ACCNT	
TZONE	
LTIME	160112
BCODE	1135E96EF770804A
CODVN	B
PASSCODE	AF496ABEA3ADFC6C6360E23BAC1ED523...
CODVC	F
PWDSALTEDHASH	{x-issha, 1024}UypLTNoaQtQBn9g1BWz5L...
CODVS	I
SECURITY_POLICY	
RETURN	

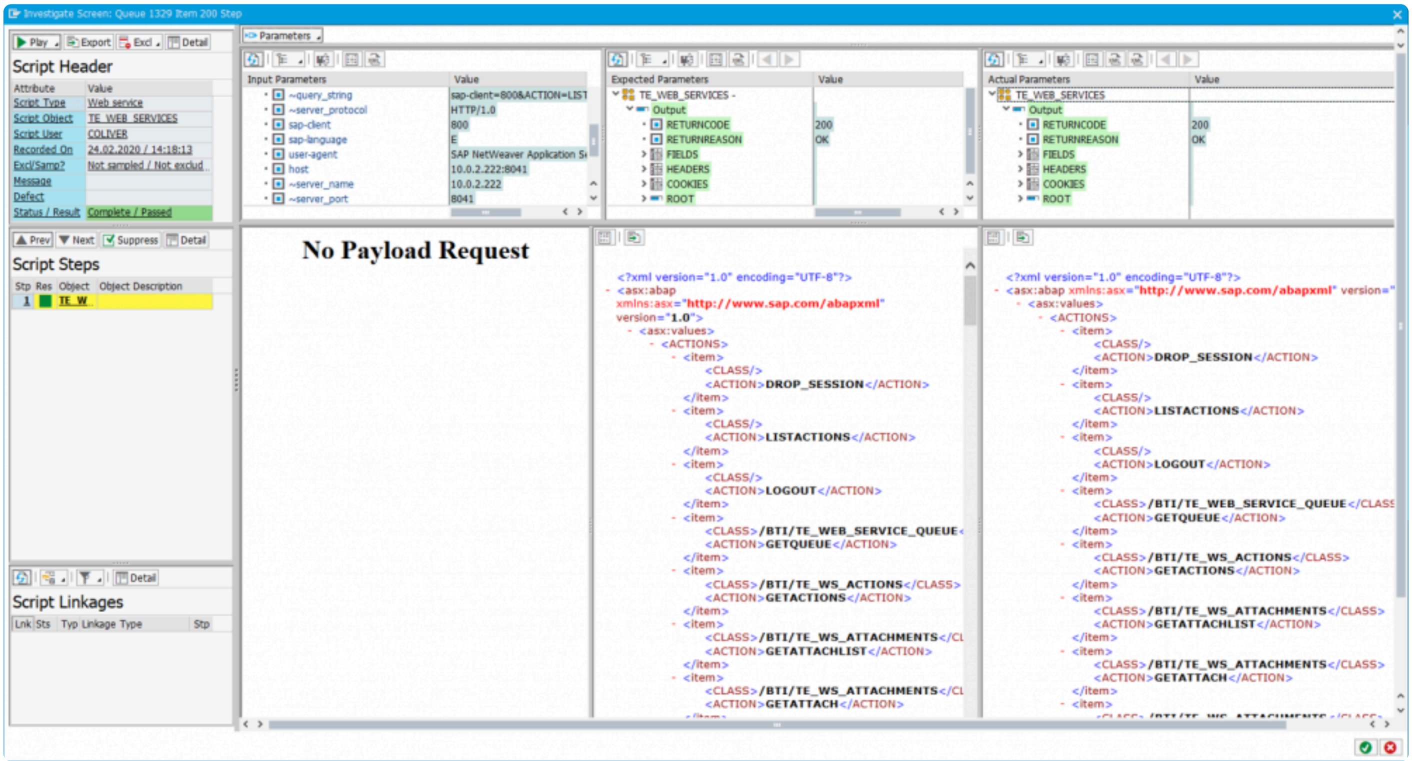
Inbound RFC investigate screen

Key changes in the new version

The investigate screen for inbound RFC is identical to the previous version. The lower part of the screen that was used for screen-shots has been removed since screen-shots are not relevant for inbound RFC.

Inbound Web-Services

An example of the new inbound web-service investigate screen is shown below:



Script Header

Attribute	Value
Script Type	Web service
Script Object	TE_WEB_SERVICES
Script User	COLIVER
Recorded On	24.02.2020 / 14:18:13
Excl/Samp?	Not sampled / Not exclud
Message	
Defect	
Status / Result	Complete / Passed

Script Steps

Stp	Res	Object	Object Description
1	🟩	TE_W	

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp

Input Parameters	Value
~query_string	sap-client=800&ACTION=LIST
~server_protocol	HTTP/1.0
sap-client	800
sap-language	E
user-agent	SAP NetWeaver Application S
host	10.0.2.222:8041
~server_name	10.0.2.222
~server_port	8041

Expected Parameters	Value
TE_WEB_SERVICES -	
Output	
RETURNCODE	200
RETURNREASON	OK
FIELDS	
HEADERS	
COOKIES	
ROOT	

Actual Parameters	Value
TE_WEB_SERVICES	
Output	
RETURNCODE	200
RETURNREASON	OK
FIELDS	
HEADERS	
COOKIES	
ROOT	

No Payload Request

```
  <?xml version="1.0" encoding="UTF-8"?>
- <asx:abap
  xmlns:asx="http://www.sap.com/abapxml"
  version="1.0">
  - <asx:values>
    - <ACTIONS>
      - <item>
          <CLASS/>
          <ACTION>DROP_SESSION</ACTION>
        </item>
      - <item>
          <CLASS/>
          <ACTION>LISTACTIONS</ACTION>
        </item>
      - <item>
          <CLASS/>
          <ACTION>LOGOUT</ACTION>
        </item>
      - <item>
          <CLASS>/BTI/TE_WEB_SERVICE_QUEUE<
          <ACTION>GETQUEUE</ACTION>
        </item>
      - <item>
          <CLASS>/BTI/TE_WS_ACTIONS</CLASS>
          <ACTION>GETACTIONS</ACTION>
        </item>
      - <item>
          <CLASS>/BTI/TE_WS_ATTACHMENTS</CL
          <ACTION>GETATTACHLIST</ACTION>
        </item>
      - <item>
          <CLASS>/BTI/TE_WS_ATTACHMENTS</CL
          <ACTION>GETATTACH</ACTION>
```

```
  <?xml version="1.0" encoding="UTF-8"?>
- <asx:abap xmlns:asx="http://www.sap.com/abapxml" version="
  - <asx:values>
    - <ACTIONS>
      - <item>
          <CLASS/>
          <ACTION>DROP_SESSION</ACTION>
        </item>
      - <item>
          <CLASS/>
          <ACTION>LISTACTIONS</ACTION>
        </item>
      - <item>
          <CLASS/>
          <ACTION>LOGOUT</ACTION>
        </item>
      - <item>
          <CLASS>/BTI/TE_WEB_SERVICE_QUEUE</CLASS
          <ACTION>GETQUEUE</ACTION>
        </item>
      - <item>
          <CLASS>/BTI/TE_WS_ACTIONS</CLASS>
          <ACTION>GETACTIONS</ACTION>
        </item>
      - <item>
          <CLASS>/BTI/TE_WS_ATTACHMENTS</CLASS>
          <ACTION>GETATTACHLIST</ACTION>
        </item>
      - <item>
          <CLASS>/BTI/TE_WS_ATTACHMENTS</CLASS>
          <ACTION>GETATTACH</ACTION>
        </item>
      - <item>
```

Investigate screen for inbound web-services

This operates in the same manner as the previous investigate screen. Additional screen real-estate has been made available.

Linkage Type Screens

There are 13 linkage types which all now have their own specific investigation screen.

There are presently 3 types that are compared between the recording and the playback. This means that if the playback is different to the recording (unless suppressed) they will fail the script during playback:

- **Change Documents**
- **SAP Script Forms**
- **Inbound / Outbound IDoc's**

The next 6 types are used for service virtualization during the playback in order to mimic what the system does or what the user does by the bot:

- **Front-end Actions**
- **Local Files**
- **Application Server Files**
- **SET/GET Parameters**
- **User Preferences**
- **Clipboard Imports**

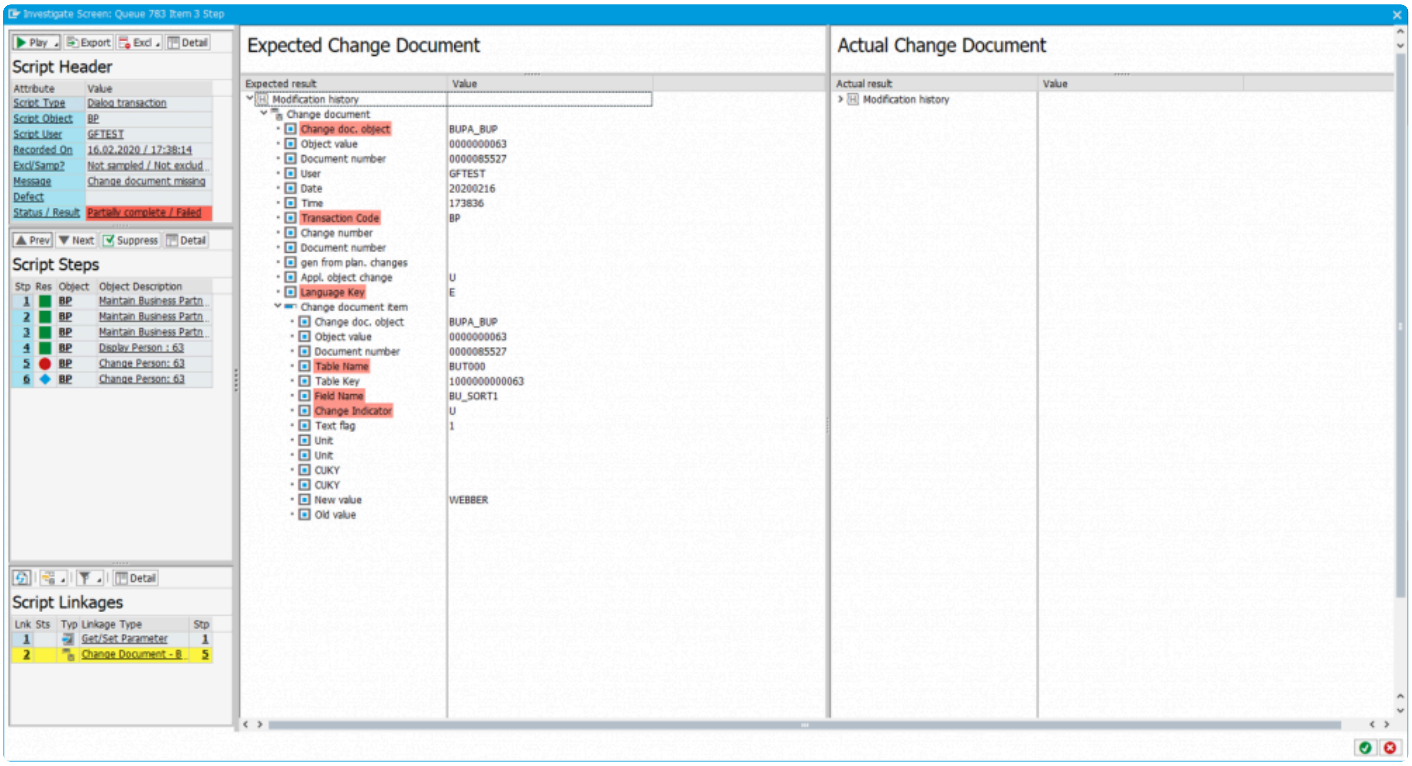
And finally, the following linkage types are used to obtain key information on business processes so that Testimony can understand links between scripts/steps or provide additional information to the user investigating the playback:

- **Number Ranges**
- **Dynamic ID**
- **Dynamic ID (User Prefs)**
- **Spool Requests**

Each linkage type can be visually seen in the investigate screen by selecting the linkage in the lower left side of the screen. Each of these are now described in the following sub-sections.

Change Documents

! This linkage type is used for validating that the same change document (or change documents) were also generated in the playback system for the same script/step. There are two failure reasons (1) Change document missing or (2) Change document is different.



Investigate Screen: Queue 783 Item 3 Step

Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	BP
Script User	GFTEST
Recorded On	16.02.2020 / 17:38:14
Excl/Samp?	Not sampled / Not exclud...
Message	Change document missing
Defect	
Status / Result	Partially complete / Failed

Script Steps

Stp	Res	Object	Object Description
1	🟩	BP	Maintain Business Partn...
2	🟩	BP	Maintain Business Partn...
3	🟩	BP	Maintain Business Partn...
4	🟩	BP	Display Person : 63
5	●	BP	Change Person: 63
6	◆	BP	Change Person: 63

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2			Change Document - B...	5

Expected Change Document

Expected result	Value
Modification history	
Change document	
Change doc. object	BUPA_BUP
Object value	0000000063
Document number	0000085527
User	GFTEST
Date	20200216
Time	173836
Transaction Code	BP
Change number	
Document number	
gen from plan. changes	
Appl. object change	U
Language Key	E
Change document item	
Change doc. object	BUPA_BUP
Object value	0000000063
Document number	0000085527
Table Name	BUT000
Table Key	1000000000063
Field Name	BU_SORT1
Change Indicator	U
Text flag	1
Unit	
Unit	
CUKY	
CUKY	
New value	WEBBER
Old value	

Actual Change Document

Actual result	Value
Modification history	

Linkage Type - Change Document

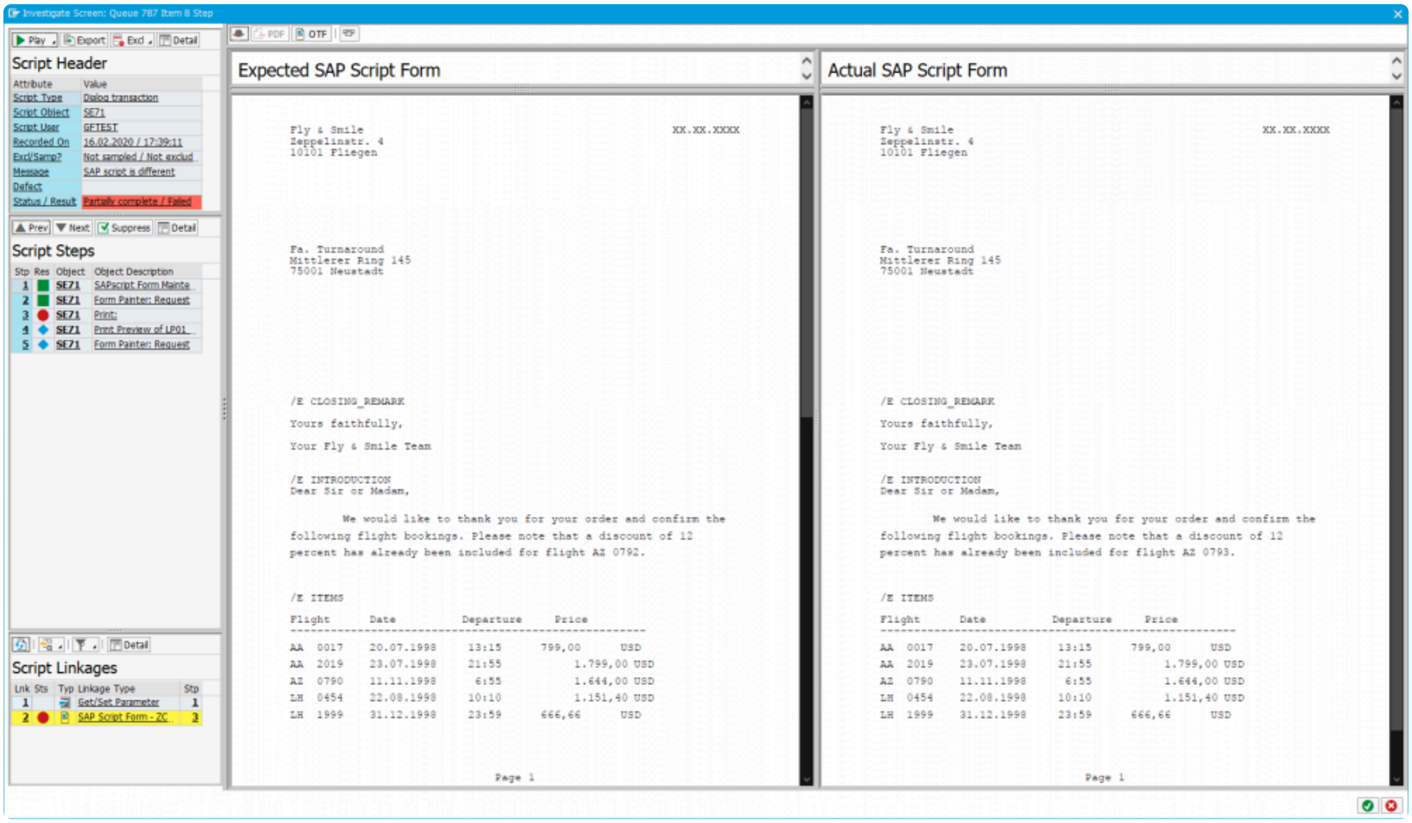
There are two failure reasons for change documents:

1. **Change Document Missing** – this failure reason means that when the expected change document is validated, a corresponding change document from the playback was not found.
2. **Change Document Different** – the corresponding change document was found, but when the header or line items were compared, they were found to be different

Each change document that is captured in the recording is compared with the change documents that were captured in the playback. The result of this comparison is shown in the lower left linkage list. A green indicator shows that the comparison was the same. If it is red it means the validation failed.

SAP Script Forms

! This linkage type is used for validating that the same SAP Script Form were also generated in the playback system for the same script/step. There are two failure reasons (1) SAP Script Form missing or (2) SAP Script Form is different.



Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	SE71
Script User	GFTEST
Recorded On	16.02.2020 / 17:39:11
Excl/Samp?	Not sampled / Not exclud..
Message	SAP script is different
Defect	
Status / Result	Partially complete / Failed

Script Steps

Stp	Res	Object	Object Description
1	🟩	SE71	SAPscript Form Mainte..
2	🟩	SE71	Form Painter: Request
3	●	SE71	Print:
4	◆	SE71	Print Preview of LP01 ..
5	◆	SE71	Form Painter: Request

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2	●		SAP Script Form - ZC..	3

Expected SAP Script Form

```
Fly & Smile                                             XX.XX.XXXX
Zeppelinstr. 4
10101 Fliegen




Fa. Turnaround
Mittlerer Ring 145
75001 Neustadt




/E CLOSING_REMARK

Yours faithfully,

Your Fly & Smile Team

/E INTRODUCTION
Dear Sir or Madam,

        We would like to thank you for your order and confirm the
following flight bookings. Please note that a discount of 12
percent has already been included for flight AZ 0792.


/E ITEMS

Flight     Date          Departure     Price
-----------------------------------------------------
AA  0017   20.07.1998     13:15      799,00      USD
AA  2019   23.07.1998     21:55          1.799,00 USD
AZ  0790   11.11.1998      6:55          1.644,00 USD
LH  0454   22.08.1998     10:10          1.151,40 USD
LH  1999   31.12.1998     23:59      666,66      USD


                          Page 1
```

Actual SAP Script Form

```
Fly & Smile                                             XX.XX.XXXX
Zeppelinstr. 4
10101 Fliegen




Fa. Turnaround
Mittlerer Ring 145
75001 Neustadt




/E CLOSING_REMARK

Yours faithfully,

Your Fly & Smile Team

/E INTRODUCTION
Dear Sir or Madam,

        We would like to thank you for your order and confirm the
following flight bookings. Please note that a discount of 12
percent has already been included for flight AZ 0793.


/E ITEMS

Flight     Date          Departure     Price
-----------------------------------------------------
AA  0017   20.07.1998     13:15      799,00      USD
AA  2019   23.07.1998     21:55          1.799,00 USD
AZ  0790   11.11.1998      6:55          1.644,00 USD
LH  0454   22.08.1998     10:10          1.151,40 USD
LH  1999   31.12.1998     23:59      666,66      USD


                          Page 1
```

Linkage Type - SAP Script Form

There are two failure reasons for SAP Script Forms:

1. **SAP Script Form Missing** – this failure reason means that when the expected SAP Script Form is validated, a corresponding form from the playback was not found
2. **SAP Script Form Different** – the corresponding SAP Script Form from the playback was found, but when the header or OTF data was compared, they were found to be different

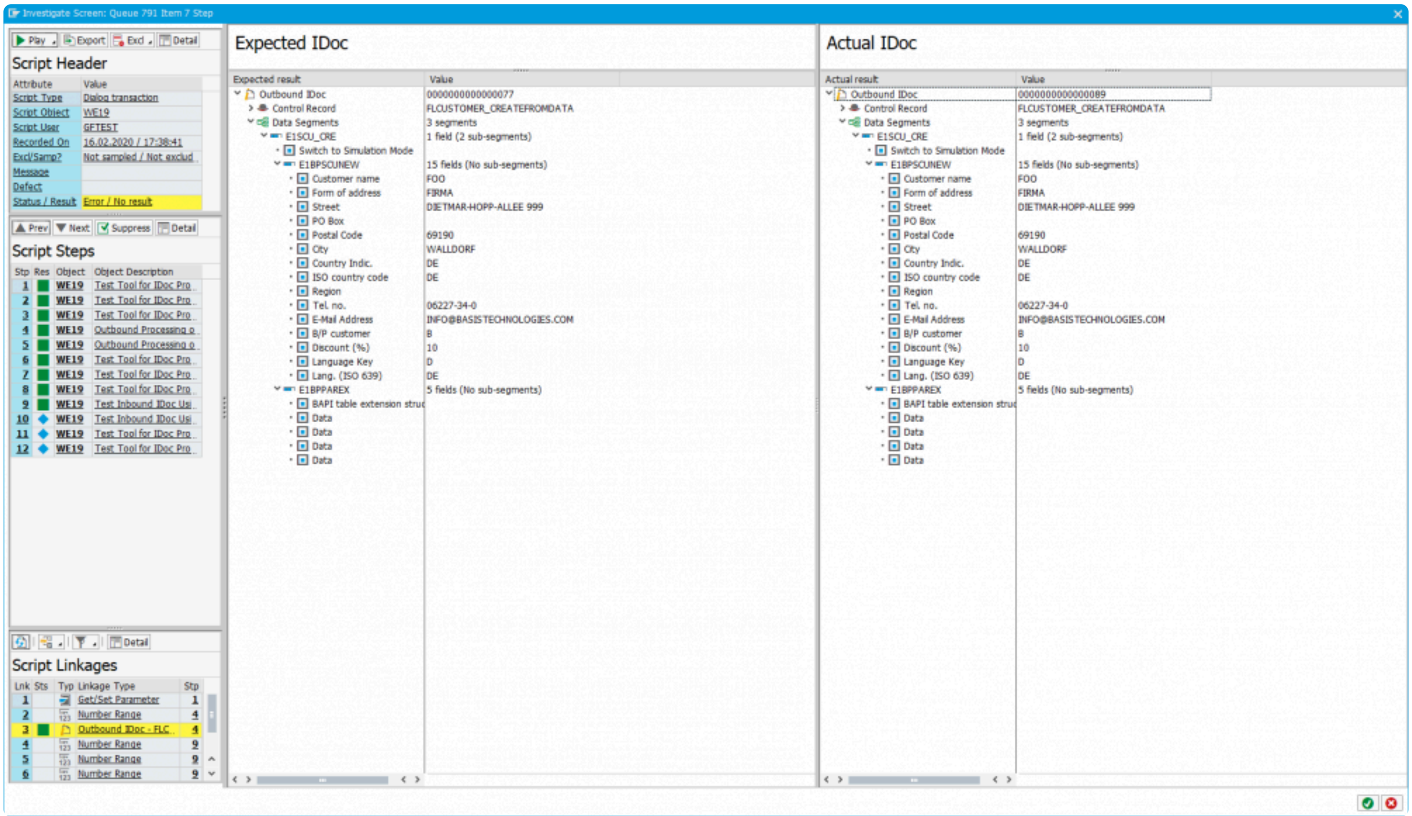
✻ You can additionally view the header of the SAP Script Form or the raw OTF data of the form by selecting the approprate toolbar option.

> ✻ Each SAP Script Form that is captured in the recording is compared with the forms that were captured in the playback. The result of this comparison is shown in the lower left linkage list. A green indicator shows that the comparison was the same. If it is red it means the validation failed.

Additional information is available in the Key Enhancements for Testimony v2.21 on SAP Script Forms.

Inbound / Outbound IDocs

! This linkage type is used for validating that the same IDoc was also generated in the playback system for the same script/step. There are two failure reasons (1) IDoc missing or (2) IDoc is different.



Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	WE19
Script User	GFTEST
Recorded On	16.02.2020 / 17:38:41
Excl/Samp?	Not sampled / Not exclud
Message	
Defect	
Status / Result	Error / No result

Script Steps

Stp	Res	Object	Object Description
1	🟩	WE19	Test Tool for IDoc Pro
2	🟩	WE19	Test Tool for IDoc Pro
3	🟩	WE19	Test Tool for IDoc Pro
4	🟩	WE19	Outbound Processing o
5	🟩	WE19	Outbound Processing o
6	🟩	WE19	Test Tool for IDoc Pro
7	🟩	WE19	Test Tool for IDoc Pro
8	🟩	WE19	Test Tool for IDoc Pro
9	🟩	WE19	Test Inbound IDoc Usi
10	◆	WE19	Test Inbound IDoc Usi
11	◆	WE19	Test Tool for IDoc Pro
12	◆	WE19	Test Tool for IDoc Pro

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2			Number Range	4
3	🟩		Outbound IDoc - FLC	4
4			Number Range	9
5			Number Range	9
6			Number Range	9

Expected IDoc

Expected result	Value
Outbound IDoc	0000000000000077
Control Record	FLCUSTOMER_CREATEFROMDATA
Data Segments	3 segments
E1SCU_CRE	1 field (2 sub-segments)
Switch to Simulation Mode	
E1BPSCUNEW	15 fields (No sub-segments)
Customer name	FOO
Form of address	FIRMA
Street	DIETMAR-HOPP-ALLEE 999
PO Box	
Postal Code	69190
City	WALLDORF
Country Indic.	DE
ISO country code	DE
Region	
Tel. no.	06227-34-0
E-Mail Address	INFO@BASISTECHNOLOGIES.COM
B/P customer	B
Discount (%)	10
Language Key	D
Lang. (ISO 639)	DE
E1BPPAREX	5 fields (No sub-segments)
BAPI table extension struc	
Data	
Data	
Data	
Data	

Actual IDoc

Actual result	Value
Outbound IDoc	0000000000000089
Control Record	FLCUSTOMER_CREATEFROMDATA
Data Segments	3 segments
E1SCU_CRE	1 field (2 sub-segments)
Switch to Simulation Mode	
E1BPSCUNEW	15 fields (No sub-segments)
Customer name	FOO
Form of address	FIRMA
Street	DIETMAR-HOPP-ALLEE 999
PO Box	
Postal Code	69190
City	WALLDORF
Country Indic.	DE
ISO country code	DE
Region	
Tel. no.	06227-34-0
E-Mail Address	INFO@BASISTECHNOLOGIES.COM
B/P customer	B
Discount (%)	10
Language Key	D
Lang. (ISO 639)	DE
E1BPPAREX	5 fields (No sub-segments)
BAPI table extension struc	
Data	
Data	
Data	
Data	

Linkage Type - Inbound / Outbound IDoc

There are two failure reasons for inbound and outbound IDocs:

1. **IDoc Missing** – this failure reason means that when the expected IDoc was validated, a corresponding IDoc from the playback was not found
2. **IDoc is Different** – the corresponding IDoc from the playback was found, but when the control record or the IDoc segment data was compared, they were found to be different

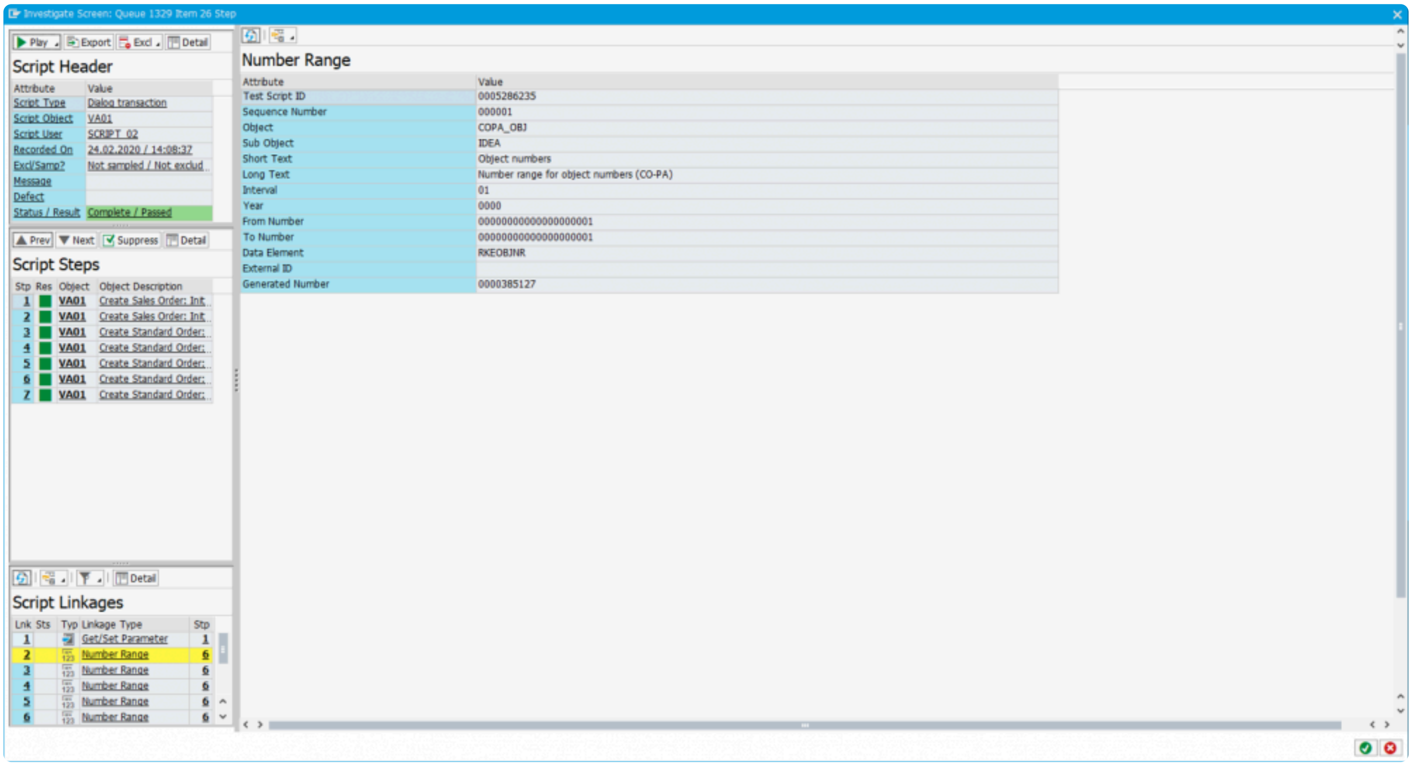
✻ Each IDoc that is captured in the recording is compared with the IDoc’s that were captured in the playback. The result of this comparison is shown in the lower left linkage list. A green indicator shows that the comparison was the same. If it is red it means the validation failed.

Additional information is available in the Key Enhancements for Testimony v2.21 on “IDoc deep valiation”:

Number Range

A number range retrieval is captured during the recording and used to find “Dynamic ID’s” between scripts / steps. These create dependencies so that earlier scripts can create data which can then be used subsequently in later scripts.

An example of a number range linkage displayed in the new investigate screen is shown below:



Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	VA01
Script User	SCRIPT_02
Recorded On	24.02.2020 / 14:08:37
Excl/Samp?	Not sampled / Not exclud...
Message	
Defect	
Status / Result	Complete / Passed

Script Steps

Stp	Res	Object	Object Description
1	🟩	VA01	Create Sales Order: Init...
2	🟩	VA01	Create Sales Order: Init...
3	🟩	VA01	Create Standard Order:...
4	🟩	VA01	Create Standard Order:...
5	🟩	VA01	Create Standard Order:...
6	🟩	VA01	Create Standard Order:...
7	🟩	VA01	Create Standard Order:...

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2		123	Number Range	6
3		123	Number Range	6
4		123	Number Range	6
5		123	Number Range	6
6		123	Number Range	6

Number Range

Attribute	Value
Test Script ID	0005286235
Sequence Number	000001
Object	COPA_OBJ
Sub Object	IDEA
Short Text	Object numbers
Long Text	Number range for object numbers (CO-PA)
Interval	01
Year	0000
From Number	00000000000000000001
To Number	00000000000000000001
Data Element	RKEOBJNR
External ID	
Generated Number	0000385127

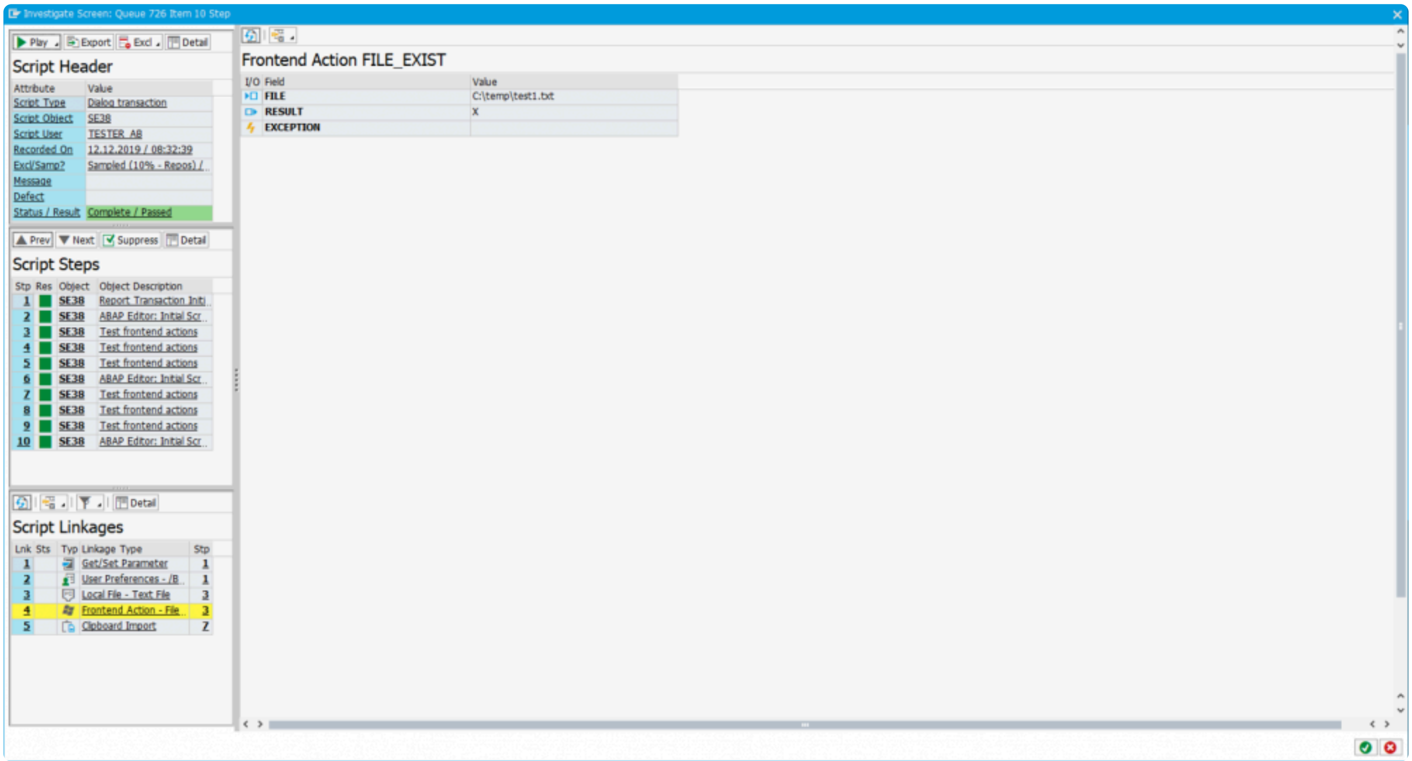
Linkage Type - Number Range

Key information on the number range retrieval include the number range object and the number itself that was retrieved in the recording.

Front-end Actions

Front-end actions are used to do service virtualization of the bots during the playback.

An example of a front-end action linkage displayed in the new investigate screen is shown below:



Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	SE38
Script User	TESTER_AB
Recorded On	12.12.2019 / 08:32:39
Excl/Samp?	Sampled (10% - Repos) / ..
Message	
Defect	
Status / Result	Complete / Passed

Script Steps

Stp	Res	Object	Object Description
1	🟩	SE38	Report Transaction Initi..
2	🟩	SE38	ABAP Editor: Initial Scr..
3	🟩	SE38	Test frontend actions
4	🟩	SE38	Test frontend actions
5	🟩	SE38	Test frontend actions
6	🟩	SE38	ABAP Editor: Initial Scr..
7	🟩	SE38	Test frontend actions
8	🟩	SE38	Test frontend actions
9	🟩	SE38	Test frontend actions
10	🟩	SE38	ABAP Editor: Initial Scr..

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2			User Preferences - /B..	1
3			Local File - Text File	3
4			Frontend Action - File..	3
5			Clipboard Import	7

Frontend Action FILE_EXIST

I/O	Field	Value
	FILE	C:\temp\test1.txt
	RESULT	X
	EXCEPTION	

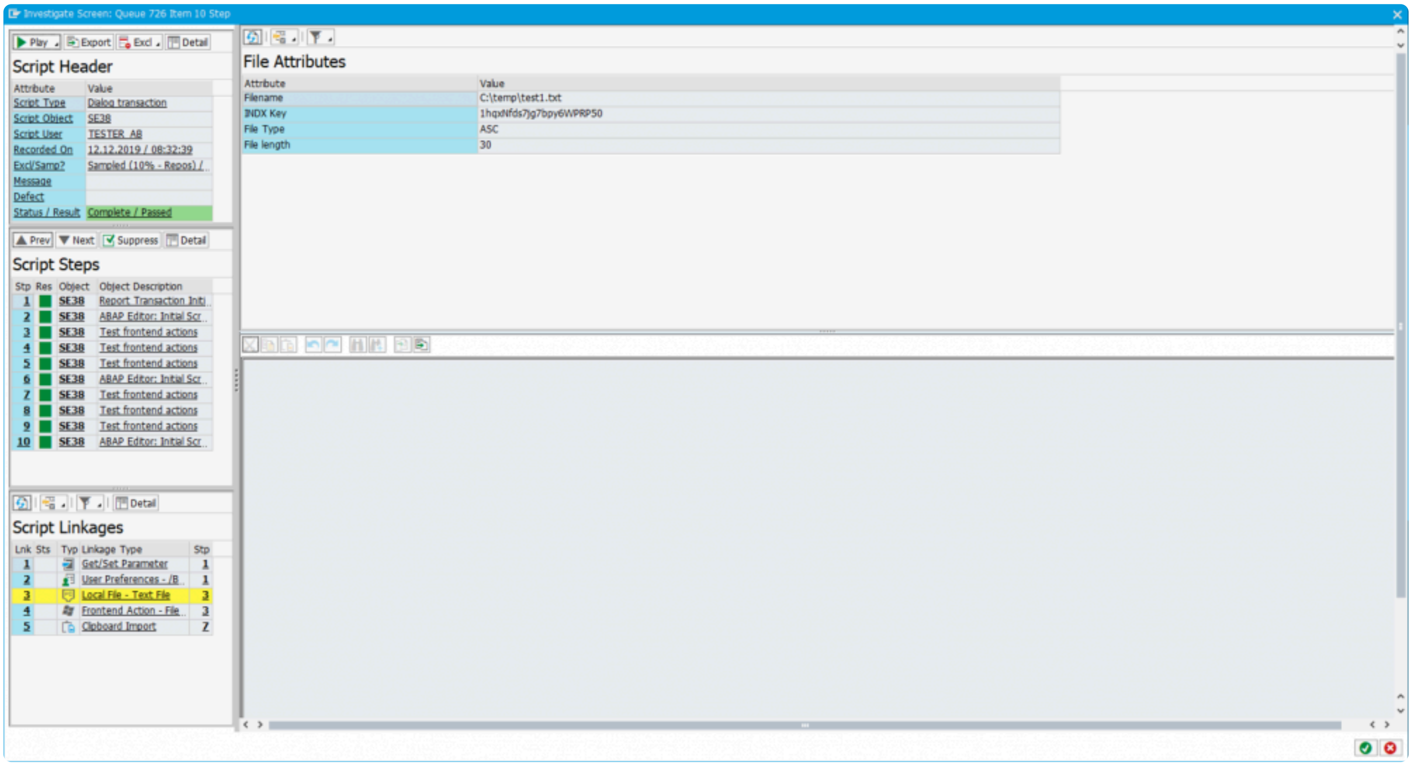
Linkage Type - Front-end Action

Key information on the front-end action includes the type of front-end action (e.g. checking if a file exists, a directory exists, creation of a local file etc) and the result of the front-end action during the recording.

Local Files

Local files are used for service virtualization of the bots during the playback.

An example of a local file that is captured during the recording and used for service virtualization in the playback is shown below.



Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	SE38
Script User	TESTER_AB
Recorded On	12.12.2019 / 08:32:39
Excl/Samp?	Sampled (10% - Repos) /..
Message	
Defect	
Status / Result	Complete / Passed

Script Steps

Stp	Res	Object	Object Description
1	🟩	SE38	Report Transaction Initi..
2	🟩	SE38	ABAP Editor: Initial Scr..
3	🟩	SE38	Test frontend actions
4	🟩	SE38	Test frontend actions
5	🟩	SE38	Test frontend actions
6	🟩	SE38	ABAP Editor: Initial Scr..
7	🟩	SE38	Test frontend actions
8	🟩	SE38	Test frontend actions
9	🟩	SE38	Test frontend actions
10	🟩	SE38	ABAP Editor: Initial Scr..

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2			User Preferences - /B..	1
3			Local File - Text File	3
4			Frontend Action - File..	3
5			Clipboard Import	7

File Attributes

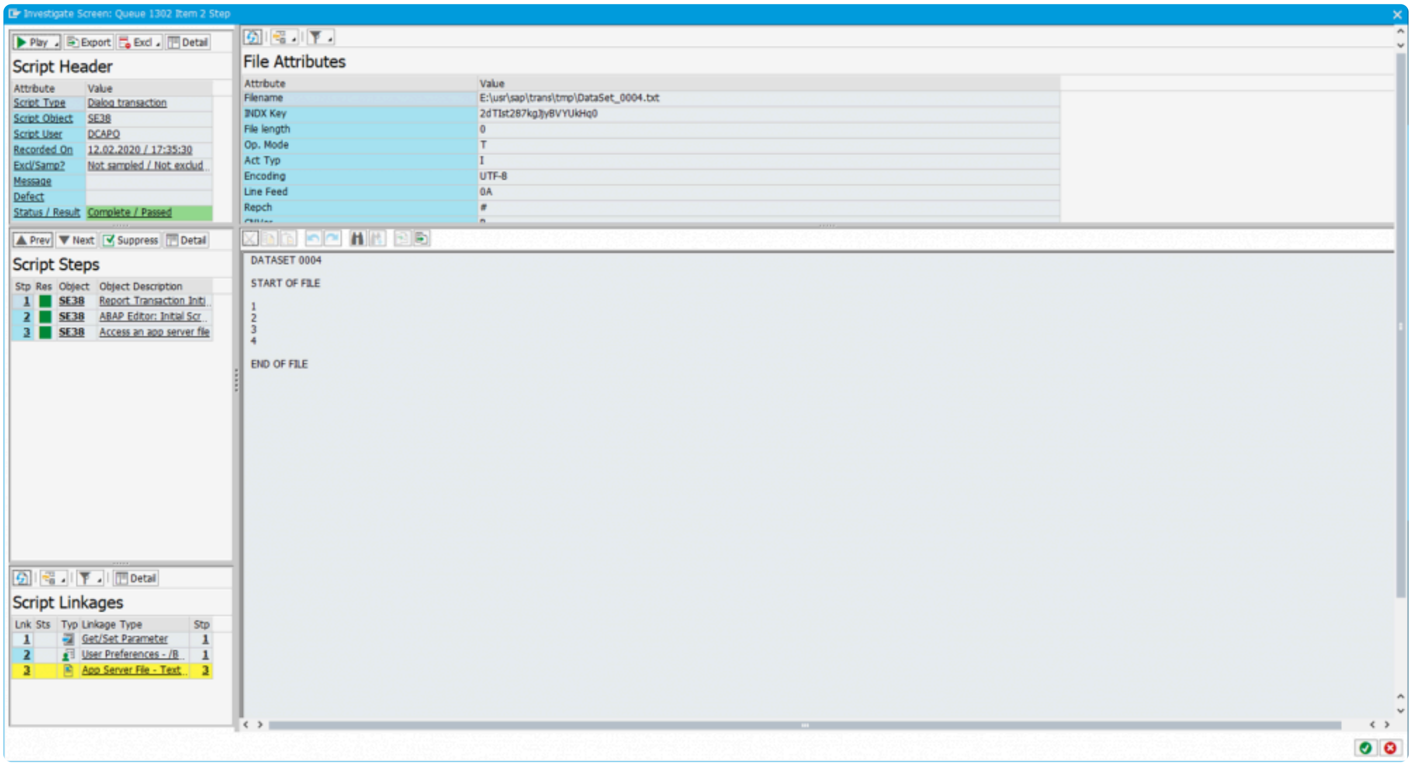
Attribute	Value
Filename	C:\temp\test1.txt
INDX Key	1hqxNfds7jg7bpy6WPRP50
File Type	ASC
File length	30

Linkage Type - Local file

Key information on the local file includes the filename and directory of the local file. The file contents can also be seen.

Application Server Files

Application server files are used to ensure that (typically) batch jobs process the same files during the playback as they did in the recording. The files are provided to the application server just prior to running the step that contains the linkage.



Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	SE38
Script User	DCAPO
Recorded On	12.02.2020 / 17:35:30
Excl/Samp?	Not sampled / Not exclud...
Message	
Defect	
Status / Result	Complete / Passed

Script Steps

Stp	Res	Object	Object Description
1	🟩	SE38	Report Transaction Initi...
2	🟩	SE38	ABAP Editor: Initial Scr...
3	🟩	SE38	Access an app server file

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2			User Preferences - /B...	1
3			App Server File - Text...	3

File Attributes

Attribute	Value
Filename	E:\usr\sap\trans\tmp\DataSet_0004.txt
INDX Key	2dTIst287kgJjyBVYUkHq0
File length	0
Op. Mode	T
Act Typ	I
Encoding	UTF-8
Line Feed	0A
Repch	#

```
DATASET 0004

START OF FILE

1
2
3
4

END OF FILE
```

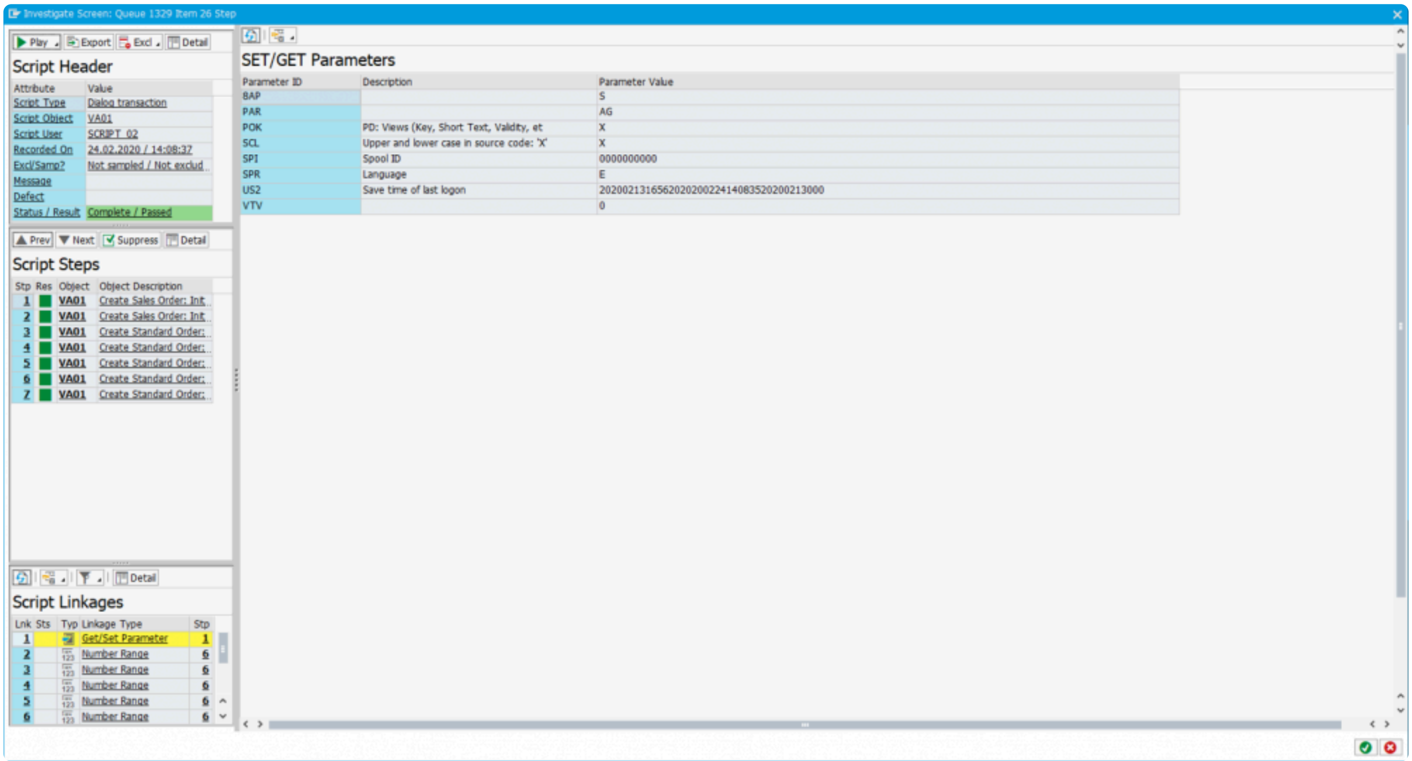
Linkage Type - Application Server File

When you click on the linkage, you can see the header properties of the file and the file contents itself.

SET/GET parameters

SET/GET parameters are used to ensure that dialog transactions run in the playback are run in the same manner as they were captured in the recording. The users SET/GET parameters are captured at the start of the transaction only (not at each step) and restored during the playback just before triggering the transaction for hte user. Thus this linkage type acts as a service virtualization technique.

An example of the new investigate screen showing these SET/GET parameters is shown below.



Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	VA01
Script User	SCRIPT_02
Recorded On	24.02.2020 / 14:08:37
Excl/Samp?	Not sampled / Not exclud...
Message	
Defect	
Status / Result	Complete / Passed

Script Steps

Stp	Res	Object	Object Description
1	🟩	VA01	Create Sales Order: Init...
2	🟩	VA01	Create Sales Order: Init...
3	🟩	VA01	Create Standard Order:...
4	🟩	VA01	Create Standard Order:...
5	🟩	VA01	Create Standard Order:...
6	🟩	VA01	Create Standard Order:...
7	🟩	VA01	Create Standard Order:...

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2		123	Number Range	6
3		123	Number Range	6
4		123	Number Range	6
5		123	Number Range	6
6		123	Number Range	6

SET/GET Parameters

Parameter ID	Description	Parameter Value
BAP		S
PAR		AG
POK	PD: Views (Key, Short Text, Validity, et	X
SCL	Upper and lower case in source code: 'X'	X
SPI	Spool ID	0000000000
SPR	Language	E
US2	Save time of last logon	2020021316562020200224140835202000213000
VTV		0

Linkage Type - SET/GET Parameters

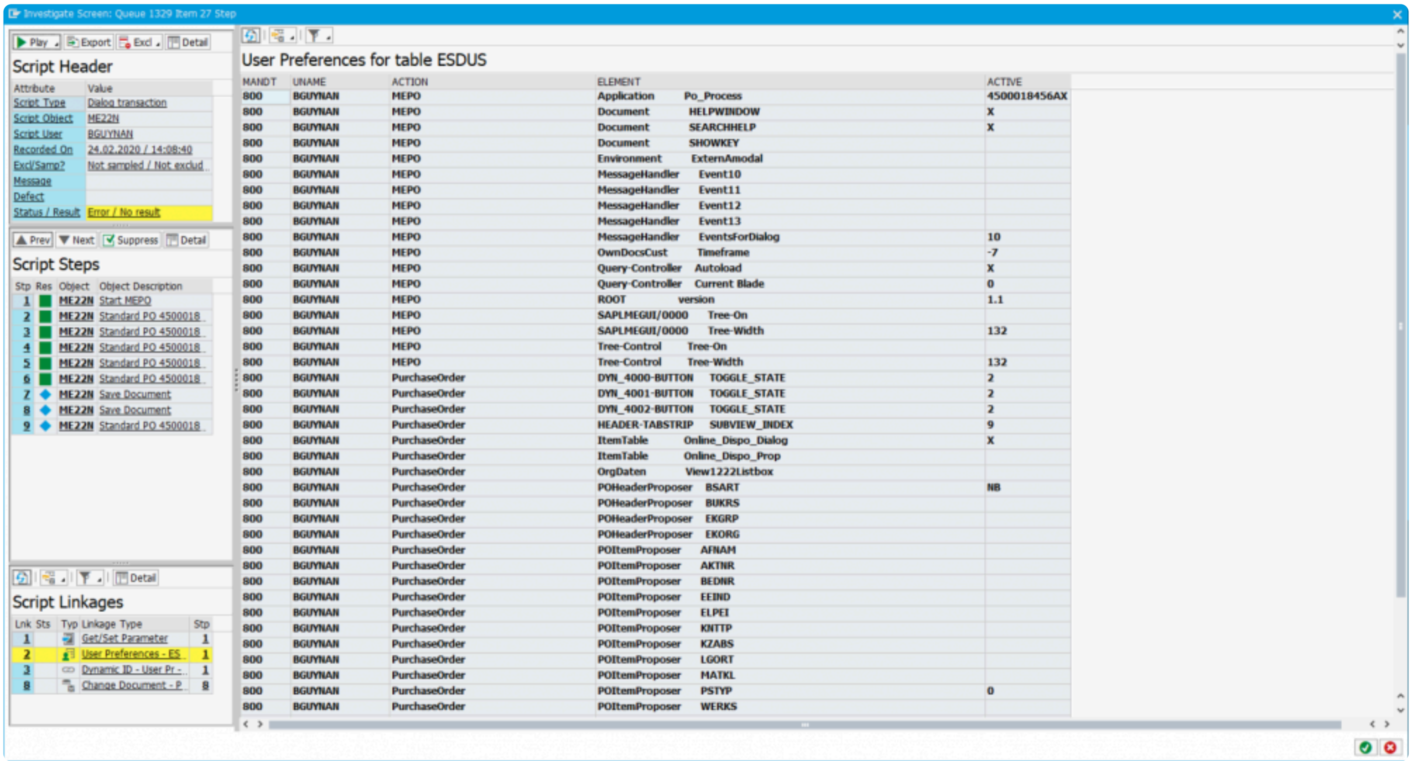
When the user clicks on the linkage, each of the SET/GET parameters that will be set during the playback are shown along with their associated values.

User Preferences

User preferences are different to SET/GET parameters in that specific transactions contain settings for a particular user stored within one or more tables. These settings are configured in configuration tables within the central system in Testimony and delivered out of the box with Testimony. However, you can configure your own entries for specific transactions that you are aware of requiring these user settings to be captured durign the recording.

When users run transactions during the recording, their user preferences are captured on the transaction being started. During the playback, these user preferences are restored prior to the transaction being started by the worker jobs and bots.

An example of the new investigate screen showing these user preferences is shown below.



Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	ME22N
Script User	BGUYNAN
Recorded On	24.02.2020 / 14:08:40
Excl/Samp?	Not sampled / Not exclud
Message	
Defect	
Status / Result	Error / No result

Script Steps

Stp	Res	Object	Object Description
1	🟩	ME22N	Start MEPO
2	🟩	ME22N	Standard PO 4500018
3	🟩	ME22N	Standard PO 4500018
4	🟩	ME22N	Standard PO 4500018
5	🟩	ME22N	Standard PO 4500018
6	🟩	ME22N	Standard PO 4500018
7	◆	ME22N	Save Document
8	◆	ME22N	Save Document
9	◆	ME22N	Standard PO 4500018

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2			User Preferences - ES	1
3			Dynamic ID - User Pr -	1
8			Change Document - P	8

User Preferences for table ESDUS

MANDT	UNAME	ACTION	ELEMENT	ACTIVE
800	BGUYNAN	MEPO	Application Po_Process	4500018456AX
800	BGUYNAN	MEPO	Document HELPWINDOW	X
800	BGUYNAN	MEPO	Document SEARCHHELP	X
800	BGUYNAN	MEPO	Document SHOWKEY	
800	BGUYNAN	MEPO	Environment ExternAmodal	
800	BGUYNAN	MEPO	MessageHandler Event10	
800	BGUYNAN	MEPO	MessageHandler Event11	
800	BGUYNAN	MEPO	MessageHandler Event12	
800	BGUYNAN	MEPO	MessageHandler Event13	
800	BGUYNAN	MEPO	MessageHandler EventsForDialog	10
800	BGUYNAN	MEPO	OwnDocsCust Timeframe	-7
800	BGUYNAN	MEPO	Query-Controller Autoload	X
800	BGUYNAN	MEPO	Query-Controller Current Blade	0
800	BGUYNAN	MEPO	ROOT version	1.1
800	BGUYNAN	MEPO	SAPLMEGUI/0000 Tree-On	
800	BGUYNAN	MEPO	SAPLMEGUI/0000 Tree-Width	132
800	BGUYNAN	MEPO	Tree-Control Tree-On	
800	BGUYNAN	MEPO	Tree-Control Tree-Width	132
800	BGUYNAN	PurchaseOrder	DYN_4000-BUTTON TOGGLE_STATE	2
800	BGUYNAN	PurchaseOrder	DYN_4001-BUTTON TOGGLE_STATE	2
800	BGUYNAN	PurchaseOrder	DYN_4002-BUTTON TOGGLE_STATE	2
800	BGUYNAN	PurchaseOrder	HEADER-TABSTRIP SUBVIEW_INDEX	9
800	BGUYNAN	PurchaseOrder	ItemTable Online_Dispo_Dialog	X
800	BGUYNAN	PurchaseOrder	ItemTable Online_Dispo_Prop	
800	BGUYNAN	PurchaseOrder	OrgDaten View1222Listbox	
800	BGUYNAN	PurchaseOrder	POHeaderProposer BSART	NB
800	BGUYNAN	PurchaseOrder	POHeaderProposer BUKRS	
800	BGUYNAN	PurchaseOrder	POHeaderProposer EKGRP	
800	BGUYNAN	PurchaseOrder	POHeaderProposer EKORG	
800	BGUYNAN	PurchaseOrder	POItemProposer AFNAM	
800	BGUYNAN	PurchaseOrder	POItemProposer AKTNR	
800	BGUYNAN	PurchaseOrder	POItemProposer BEDNR	
800	BGUYNAN	PurchaseOrder	POItemProposer EEIND	
800	BGUYNAN	PurchaseOrder	POItemProposer ELPEI	
800	BGUYNAN	PurchaseOrder	POItemProposer KNTTP	
800	BGUYNAN	PurchaseOrder	POItemProposer KZABS	
800	BGUYNAN	PurchaseOrder	POItemProposer LGORT	
800	BGUYNAN	PurchaseOrder	POItemProposer MATKL	
800	BGUYNAN	PurchaseOrder	POItemProposer PSTYP	0
800	BGUYNAN	PurchaseOrder	POItemProposer WERKS	

Linkage Type - User Preferences

When the user clicks on the linkage, each of the values that were captured in the user preference configuration tables is shown with their associated values. It is these entries that will be restored during the playback making sure that the transaction functions in precisely the same manner as was captured in the recording.

Dynamic ID

Dynamic ID’s are used to capture relationships between scripts so that data dynamically generated in one script can be used in a later script.

Simple Example

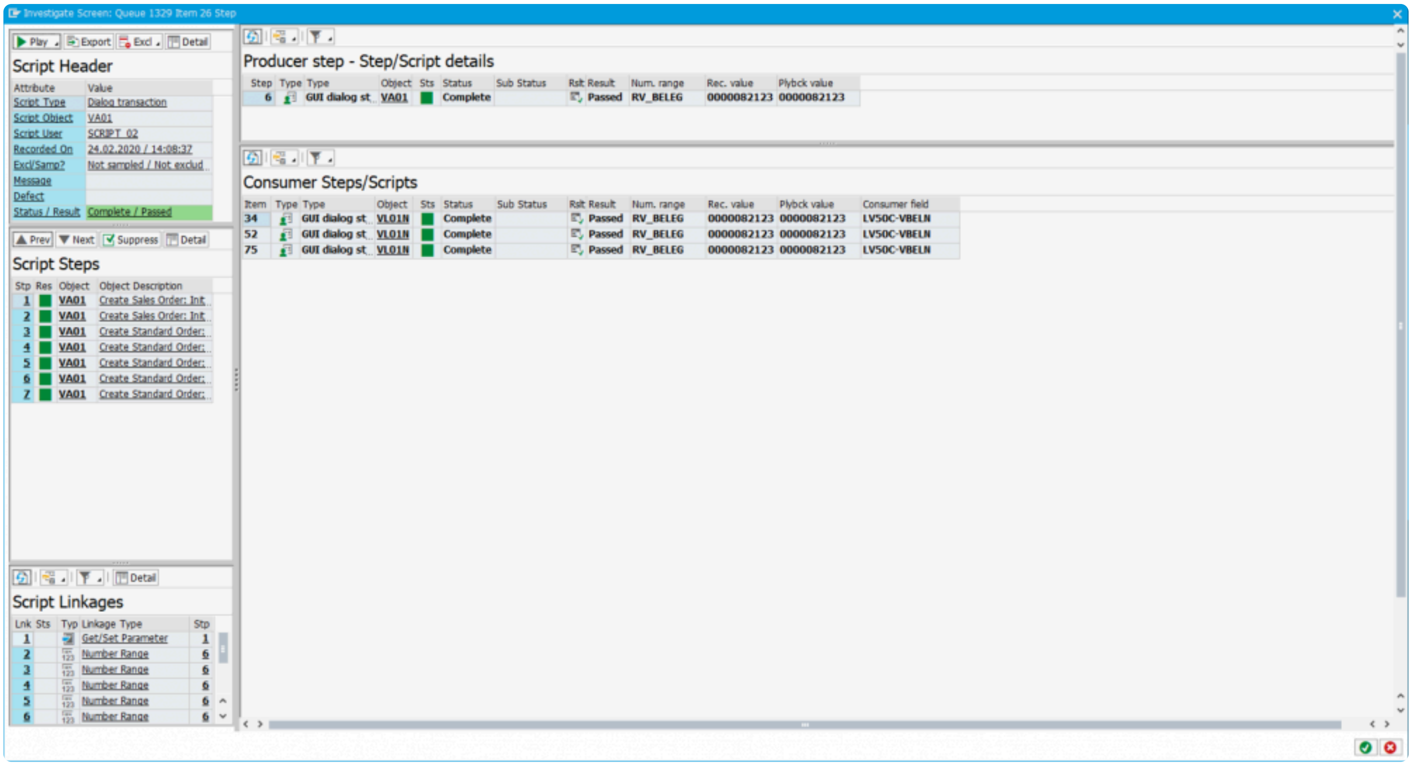
A user create a business partner in the recording. The business partner number created is number 123. The same user (or another) at a later point in time creates a new sales order for the customer 123. During the playback (due to issues with sequencing and number range buffers), the same business partner 123 may not be created by the same script. Instead, in the playback, the business partner 124 is created. Dynamic ID’s are leveraged to ensure that the second script to create a sales order is done for customer 124 rather than 123.

Dynamic ID Types

A dynamic ID can be of two types – (1) A producer or (2) a consumer. A **producer** is the step that generates the unique number / identifier. A **consumer** is a step that make use of the value from a previous producer. Various scenarios exist such as:

- A consumer cannot exist without a producer
- There can be many consumers of a producer
- A producer sciprt (or step) can also be a consumer (but these will be separate linkages)
- Consumers can exist within the same script as a producer

An example of the new investigate screen showing these dynamic ID’s is shown below:



Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	VA01
Script User	SCRIPT_02
Recorded On	24.02.2020 / 14:08:37
Excl/Samp?	Not sampled / Not exclud
Message	
Defect	
Status / Result	Complete / Passed

Script Steps

Stp	Res	Object	Object Description
1	🟩	VA01	Create Sales Order: Init
2	🟩	VA01	Create Sales Order: Init
3	🟩	VA01	Create Standard Order:
4	🟩	VA01	Create Standard Order:
5	🟩	VA01	Create Standard Order:
6	🟩	VA01	Create Standard Order:
7	🟩	VA01	Create Standard Order:

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2			Number Range	6
3			Number Range	6
4			Number Range	6
5			Number Range	6
6			Number Range	6

Producer step - Step/Script details

Step	Type	Type	Object	Sts	Status	Sub Status	Rslt	Result	Num. range	Rec. value	Plybck value
6		GUI dialog st	VA01	🟩	Complete			Passed	RV_BELEG	0000082123	0000082123

Consumer Steps/Scripts

Item	Type	Type	Object	Sts	Status	Sub Status	Rslt	Result	Num. range	Rec. value	Plybck value	Consumer field
34		GUI dialog st	VL01N	🟩	Complete			Passed	RV_BELEG	0000082123	0000082123	LV50C-VBELN
52		GUI dialog st	VL01N	🟩	Complete			Passed	RV_BELEG	0000082123	0000082123	LV50C-VBELN
75		GUI dialog st	VL01N	🟩	Complete			Passed	RV_BELEG	0000082123	0000082123	LV50C-VBELN

Linkage Type - User Preferences

When investigating a dynamic ID linkage, keep in mind whether you are looking at a producer or a consumer (it is made clear in the linkage list). Additional grids in the right hand side of the screen show you the consumer(s) (if you are looking at a producer). It also shows you other producer or consumers in the same scripts or later ones. You are able to see the status of the producer scripts (did they complete successfully or not).

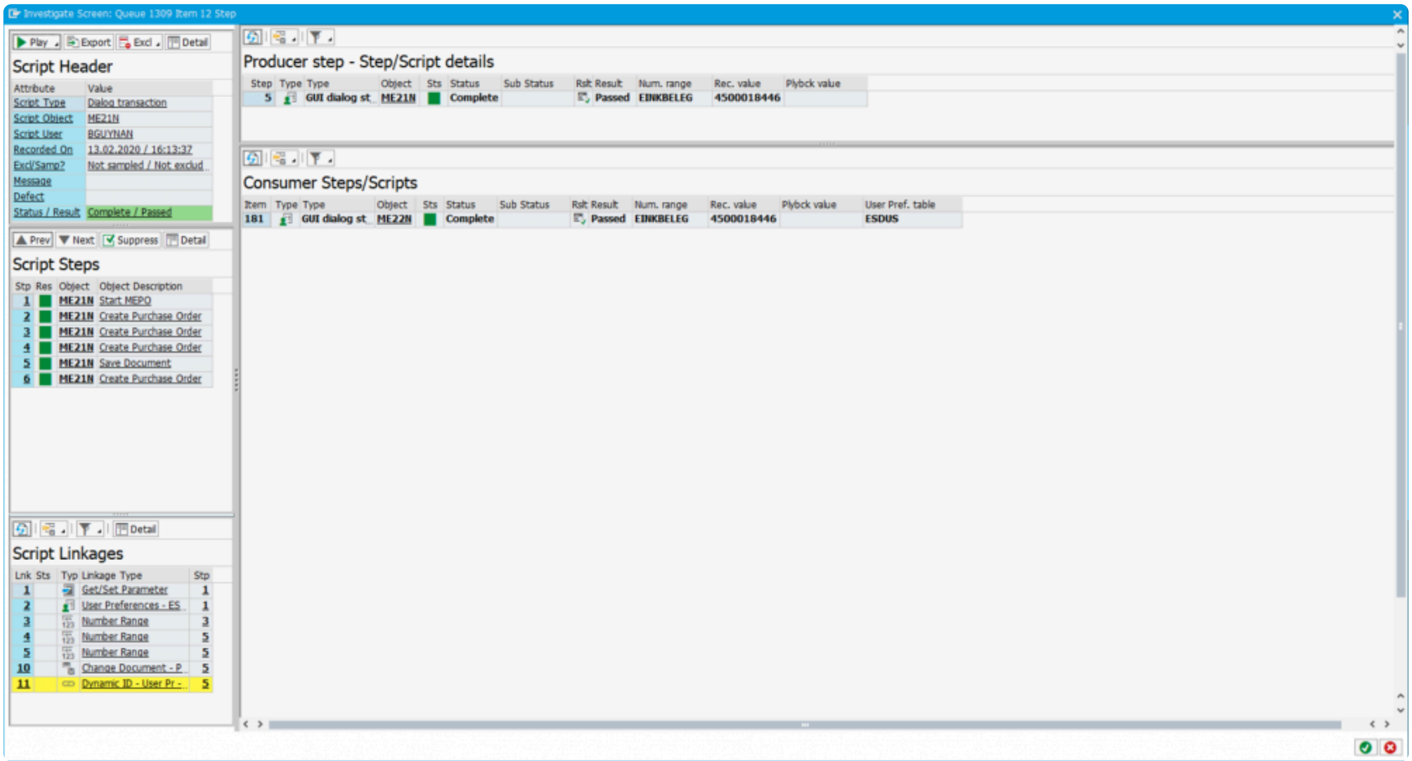
> ! Critically, you are able to see the values that were generated in the recording (for the producer) and the values that were generated in the playback. Thus you can investigate your script failure knowing the values that were used.

Dynamic ID (User Preferences)

Sometimes, user preferences contain identifiers that are dynamically generated during the playback (by Dynamic ID producers). Hence, during the playback, these dynamic variables need to be substituted prior to running common transactions so that they operate in the same during the playback as they did during the recording.

These are captured in a linkage type referred to as **Dynamic ID User Preferences**.

An example screen-shot of the investigate screen for one of these types is shown below:



Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	ME21N
Script User	BGUYNAN
Recorded On	13.02.2020 / 16:13:37
Excl/Samp?	Not sampled / Not exclud
Message	
Defect	
Status / Result	Complete / Passed

Script Steps

Stp	Res	Object	Object Description
1	🟩	ME21N	Start MEPO
2	🟩	ME21N	Create Purchase Order
3	🟩	ME21N	Create Purchase Order
4	🟩	ME21N	Create Purchase Order
5	🟩	ME21N	Save Document
6	🟩	ME21N	Create Purchase Order

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2			User Preferences - ES	1
3			Number Range	3
4			Number Range	5
5			Number Range	5
10			Change Document - P	5
11			Dynamic ID - User Pr -	5

Producer step - Step/Script details

Step	Type	Type	Object	Sts	Status	Sub Status	Rslt	Result	Num. range	Rec. value	Plybck value
5		GUI dialog st	ME21N	🟩	Complete			Passed	EINKBELEG	4500018446	

Consumer Steps/Scripts

Item	Type	Type	Object	Sts	Status	Sub Status	Rslt	Result	Num. range	Rec. value	Plybck value	User Pref. table
181		GUI dialog st	ME22N	🟩	Complete			Passed	EINKBELEG	4500018446		ESDUS

Linkage Type - Dynamic ID User Preferences

The key information in the view is what the dynamic ID value is from the recording (versus that generated in the playback) and which user settings table this dynamic identifer will be substituted into during the playback.

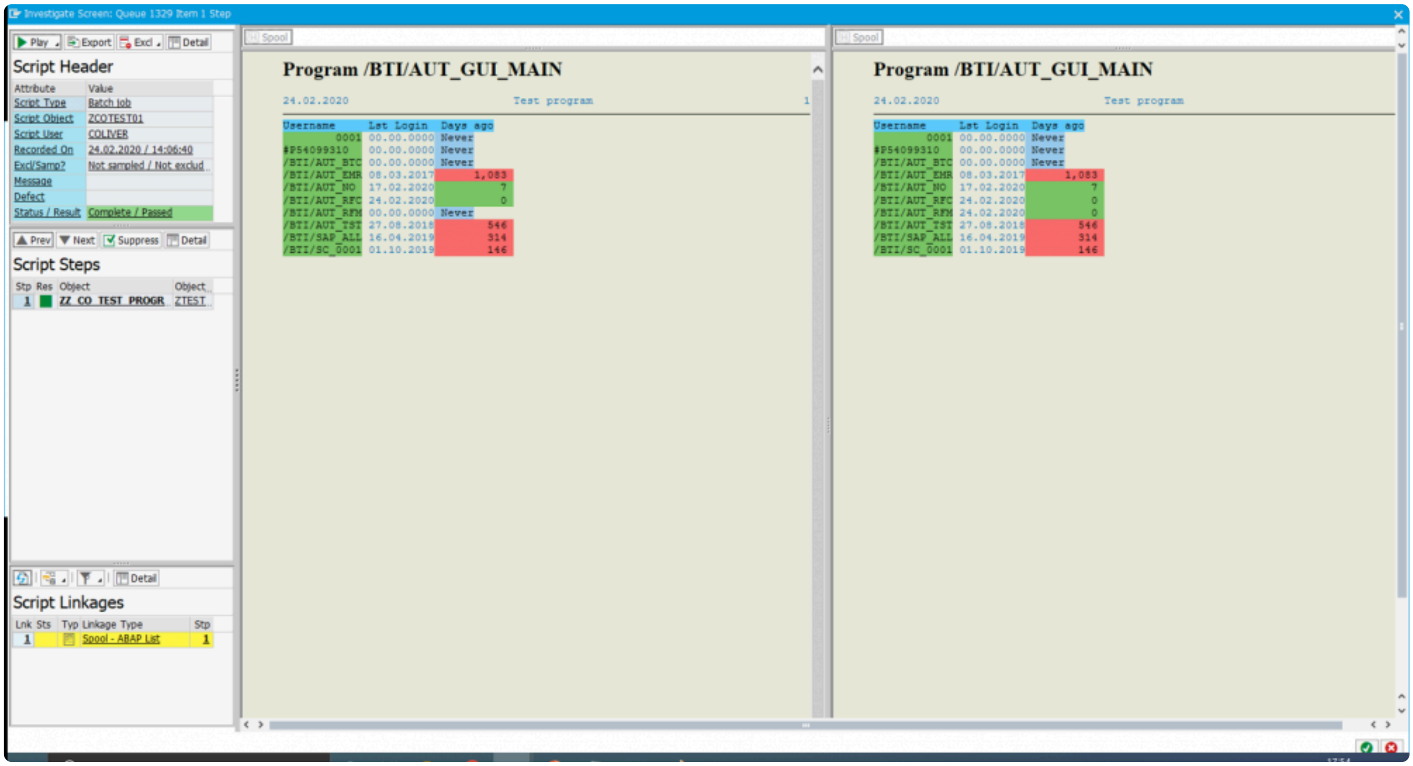
Spool Requests

Batch job steps typically generate spool requests when they run. This is not for all batch jobs but for most. The output in these spool requests often provide information as to how the program functioned during the recording and also during the playback.

Spool requests generated by batch jobs captured in the recording are now created as new linkage types at the end of the recording process (during the data transfer back to the central system). For the playback, these same spool requests generated by the batch jobs run during the playback are retrieved once the playback is completed (in a post-processing step).

While the spool requests from the recording and the playback are not currently compared in any way, the spool requests provide critical information to the user when investigating failures during the playback.

An example of the new investigate screen for the linkage type spool request is shown below.



Script Header

Attribute	Value
Script Type	Batch job
Script Object	ZCOTEST01
Script User	COLIVER
Recorded On	24.02.2020 / 14:06:40
Excl/Samp?	Not sampled / Not exclud...
Message	
Defect	
Status / Result	Complete / Passed

Script Steps

Stp	Res	Object	Object...
1	🟩	ZZ_CO_TEST_PROGR...	ZTEST...

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Spool - ABAP List	1

```
Program /BTI/AUT_GUI_MAIN

24.02.2020                    Test program                  1
-----------------------------------------------------------------
Username     Lst Login   Days ago
        0001 00.00.0000  Never
#P54099310   00.00.0000  Never
/BTI/AUT_BTC 00.00.0000  Never
/BTI/AUT_EMR 08.03.2017       1,083
/BTI/AUT_NO  17.02.2020           7
/BTI/AUT_RFC 24.02.2020           0
/BTI/AUT_RFM 00.00.0000  Never
/BTI/AUT_TST 27.08.2018         546
/BTI/SAP_ALL 16.04.2019         314
/BTI/SC_0001 01.10.2019         146
```

```
Program /BTI/AUT_GUI_MAIN

24.02.2020                    Test program
-----------------------------------------------------------------
Username     Lst Login   Days ago
        0001 00.00.0000  Never
#P54099310   00.00.0000  Never
/BTI/AUT_BTC 00.00.0000  Never
/BTI/AUT_EMR 08.03.2017       1,083
/BTI/AUT_NO  17.02.2020           7
/BTI/AUT_RFC 24.02.2020           0
/BTI/AUT_RFM 00.00.0000  Never
/BTI/AUT_TST 27.08.2018         546
/BTI/SAP_ALL 16.04.2019         314
/BTI/SC_0001 01.10.2019         146
```

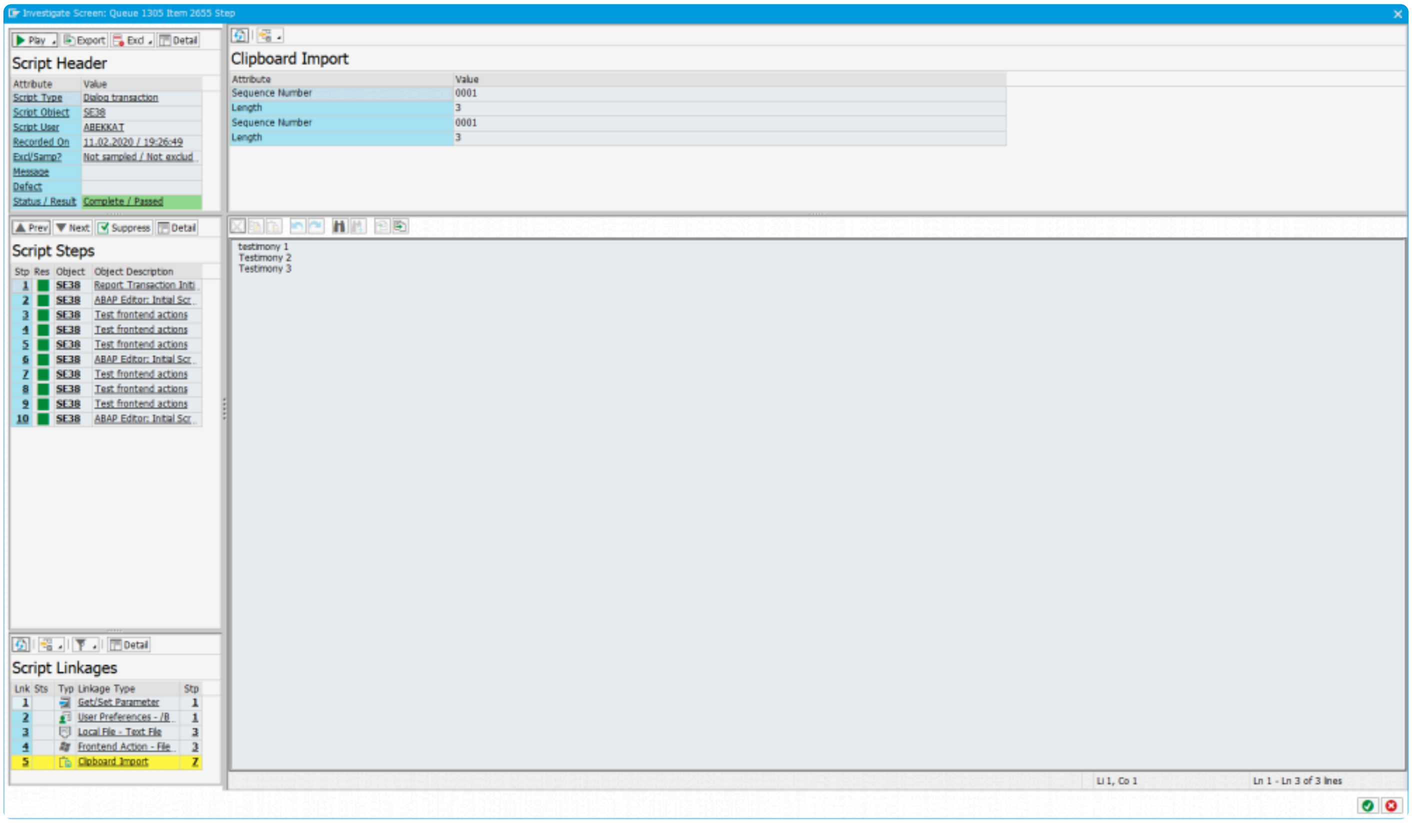
Linkage Type - Spool Request

As you can see, both the spool request generated by the batch job in the recording is shown on the left and the spool request generated by the same batch job in the playback is shown on the right. You can visually compare the two spools to determine if they functioned in a similar manner.

Clipboard Imports

During the recording, users operating SAP transactions are able to paste data from their local machine into the SAP application from their clipboard. Since the bot does not have the same content in its clipboard, it must populate this prior to executing the same step during the playback. Hence, the purpose of this linkage type is to do service virtualization during the playback to ensure the transaction operates in the same manner.

An example of a clipboard import linkage displayed in the new investigate screen is shown below:



Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	SE38
Script User	ABEKKAT
Recorded On	11.02.2020 / 19:26:49
Excl/Samp?	Not sampled / Not exclud
Message	
Defect	
Status / Result	Complete / Passed

Clipboard Import

Attribute	Value
Sequence Number	0001
Length	3
Sequence Number	0001
Length	3

Script Steps

Stp	Res	Object	Object Description
1	🟩	SE38	Report Transaction Initi
2	🟩	SE38	ABAP Editor: Initial Scr
3	🟩	SE38	Test frontend actions
4	🟩	SE38	Test frontend actions
5	🟩	SE38	Test frontend actions
6	🟩	SE38	ABAP Editor: Initial Scr
7	🟩	SE38	Test frontend actions
8	🟩	SE38	Test frontend actions
9	🟩	SE38	Test frontend actions
10	🟩	SE38	ABAP Editor: Initial Scr

```
testimony 1
Testimony 2
Testimony 3
```

Li 1, Co 1 Ln 1 - Ln 3 of 3 lines

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2			User Preferences - /B	1
3			Local File - Text File	3
4			Frontend Action - File	3
5			Clipboard Import	7

Linkage Type - Clipboard Import

The most important piece of information for the user here is the content of the clipboard that will be set in te bot during the playback.

SAP Script Forms

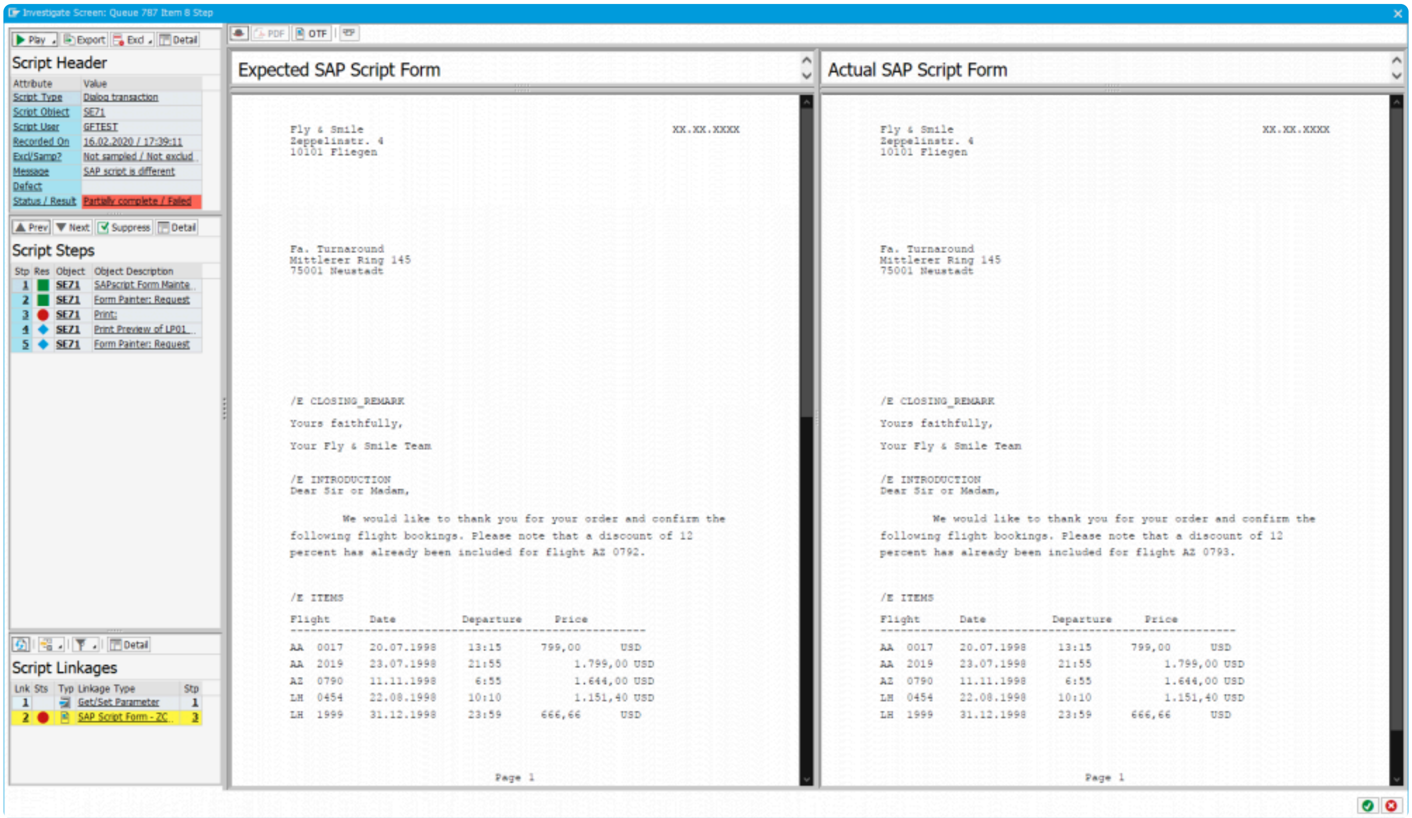
Key Information

! This is an early release of SAP Script Form capture and replay capability. It is in early ramp-up and customers are invited to trial it with support from Basis Technologies to ensure it delivers the expected business results.

SAP Scripts are a fundamental part of many customers SAP systems allowing system data to be printed or displayed for users, customers and vendors in a more modern format. SAP Scripts forms can be generated from various standard SAP transactions and sent to the printer for printing. Many batch jobs also generate SAP Script forms for spool printing.

When these SAP Script forms are generated by the system (whether through a SAP GUI dialog transaction or a batch job for example), then the Testimony capture code will automatically record them and associate them as linkages with the various scripts/steps which created them.

In the screen-shot below, you can see the SAP Script Form as a linkage for step 3 in the script. This is the step that generated the SAP Script Form.



Investigate Screen: Queue 787 Item 8 Step

Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	SE71
Script User	GFTEST
Recorded On	16.02.2020 / 17:39:11
Excl/Samp?	Not sampled / Not exclud
Message	SAP script is different
Defect	
Status / Result	Partially complete / Failed

Script Steps

Stp	Res	Object	Object Description
1	🟩	SE71	SAPscript Form Mainte
2	🟩	SE71	Form Painter: Request
3	●	SE71	Print:
4	◆	SE71	Print Preview of LP01
5	◆	SE71	Form Painter: Request

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2	●		SAP Script Form - ZC	3

Expected SAP Script Form

```
Fly & Smile                                            XX.XX.XXXX
Zeppelinstr. 4
10101 Fliegen


Fa. Turnaround
Mittlerer Ring 145
75001 Neustadt


/E CLOSING_REMARK

Yours faithfully,

Your Fly & Smile Team

/E INTRODUCTION
Dear Sir or Madam,

        We would like to thank you for your order and confirm the
following flight bookings. Please note that a discount of 12
percent has already been included for flight AZ 0792.


/E ITEMS

Flight     Date          Departure    Price
-----------------------------------------------------
AA  0017   20.07.1998     13:15      799,00     USD
AA  2019   23.07.1998     21:55          1.799,00 USD
AZ  0790   11.11.1998      6:55          1.644,00 USD
LH  0454   22.08.1998     10:10          1.151,40 USD
LH  1999   31.12.1998     23:59      666,66     USD


                       Page 1
```

Actual SAP Script Form

```
Fly & Smile                                            XX.XX.XXXX
Zeppelinstr. 4
10101 Fliegen


Fa. Turnaround
Mittlerer Ring 145
75001 Neustadt


/E CLOSING_REMARK

Yours faithfully,

Your Fly & Smile Team

/E INTRODUCTION
Dear Sir or Madam,

        We would like to thank you for your order and confirm the
following flight bookings. Please note that a discount of 12
percent has already been included for flight AZ 0793.


/E ITEMS

Flight     Date          Departure    Price
-----------------------------------------------------
AA  0017   20.07.1998     13:15      799,00     USD
AA  2019   23.07.1998     21:55          1.799,00 USD
AZ  0790   11.11.1998      6:55          1.644,00 USD
LH  0454   22.08.1998     10:10          1.151,40 USD
LH  1999   31.12.1998     23:59      666,66     USD


                       Page 1
```

SAP Script Form example

> The red indicator next to the linkage in the lower left part of the screen indicates that the validation of the recorded script with what happened in the playback has failed.

When the linkage in the lower left is selected, the right hand side appears with the recorded/expected SAP Script form on the left and the playback/actual SAP Script form on the right. You are able to see the header information relating to the two forms, the PDF view of the forms as well as the raw OTF data.

Recording SAP Script Forms

To capture SAP Script Forms in your source system, you need to activate the SAP Script Form recording enhancement. This is detailed in the following earlier section on General Enhancements -> Enhancements.

Once captured in the recording, these linkages will be visible as “SAP Script Form” linkages in the **Business Transaction Linkage Explorer**. After transferring to the Repository, these same linkages will be found within the **Test Script Linkage Explorer**.

Playing back and comparing SAP Script Forms

During the playback, the same SAP Script Forms will be captured and then compared to what happened in the recording.

Additional Notes

You can deactivate the comparison of the raw OTF data if you expect to see differences between the form data in the recording versus the playback. This would typically happen if such fields as time-stamps, unique identifiers or GUID’s are contained within the output data. This parameter is explained in the earlier section on Configuration Parameters.

> ! Note that you are now able to “suppress” certain sections within the SAP Script Form. These are defined as the “Windows” as per the definition of a SAP Script Form. The configuration must be entered into the central system, table /BTI/AUT_C_CHSF. This allows you to either include or exclude certain windows from the comparison for a particular form name.

IDoc Deep Validation

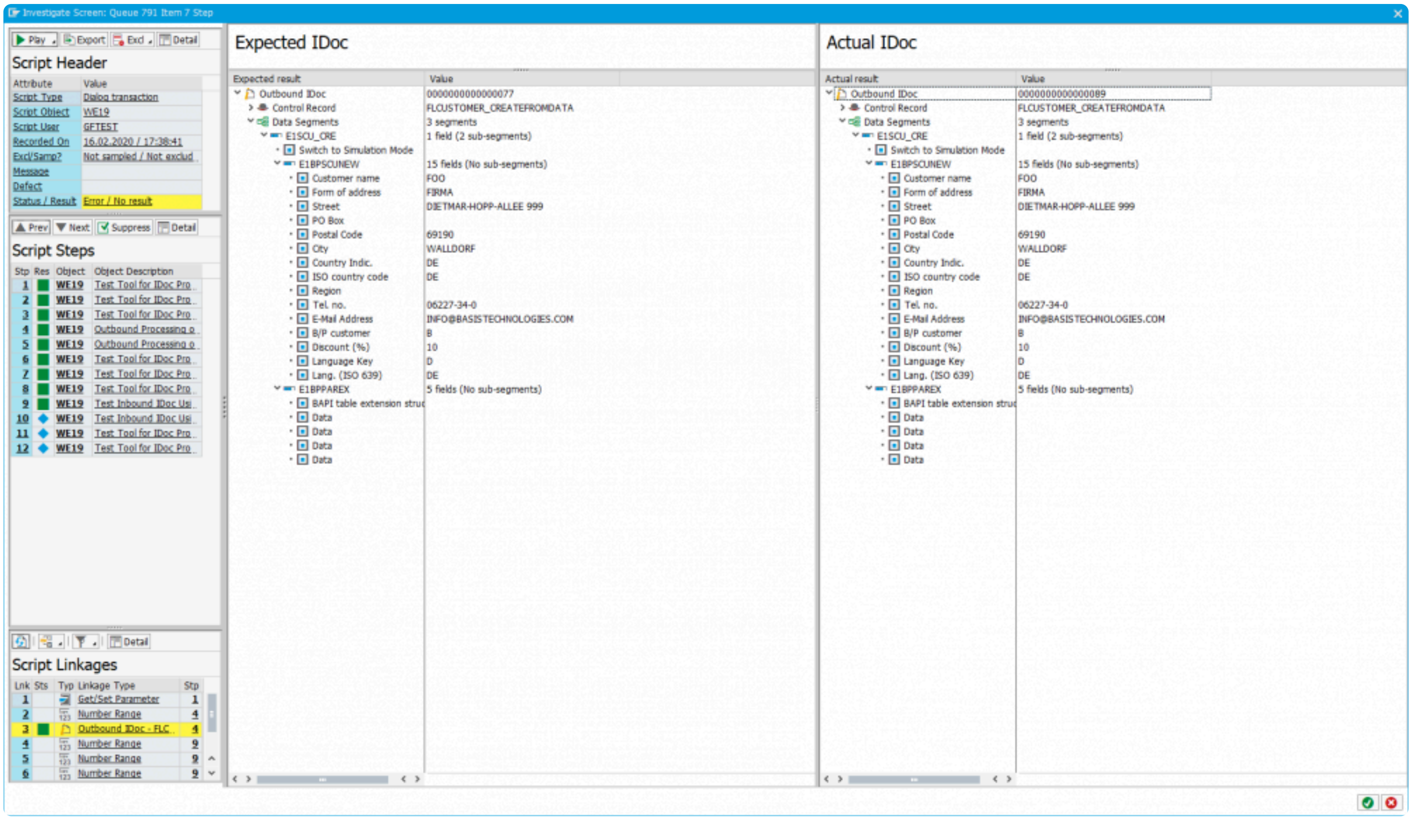
Key Information

> ! This is an early release of inbound and outbound IDoc capture and replay capability. It is in early ramp-up and customers are invited to trial it with support from Basis Technologies to ensure it delivers the expected business results.

IDoc’s are a fundamental part of many customers SAP systems allowing data to be integrated to other systems in an asynchronous manner and in a commonly understood format. IDoc’s represent a significant portion of the global supply chain between various parties exchanging information automatically between systems.

When these IDoc’s are generated by the system (whether through a SAP GUI dialog transaction or typically a batch job), then the Testimony capture code will automatically record them and associate them as linkages with the various scripts/steps which created them.

In the screen-shot below, you can see the IDoc as a linkage for step 4 in the script. This is the step that generated the oubtound IDoc.



Script Header

Attribute	Value
Script Type	Dialog transaction
Script Object	WE19
Script User	GFTEST
Recorded On	16.02.2020 / 17:38:41
Excl/Samp?	Not sampled / Not exclud
Message	
Defect	
Status / Result	Error / No result

Script Steps

Stp	Res	Object	Object Description
1	🟩	WE19	Test Tool for IDoc Pro
2	🟩	WE19	Test Tool for IDoc Pro
3	🟩	WE19	Test Tool for IDoc Pro
4	🟩	WE19	Outbound Processing o
5	🟩	WE19	Outbound Processing o
6	🟩	WE19	Test Tool for IDoc Pro
7	🟩	WE19	Test Tool for IDoc Pro
8	🟩	WE19	Test Tool for IDoc Pro
9	🟩	WE19	Test Inbound IDoc Usi
10	◆	WE19	Test Inbound IDoc Usi
11	◆	WE19	Test Tool for IDoc Pro
12	◆	WE19	Test Tool for IDoc Pro

Script Linkages

Lnk	Sts	Typ	Linkage Type	Stp
1			Get/Set Parameter	1
2			Number Range	4
3	🟩		Outbound IDoc - FLC	4
4			Number Range	9
5			Number Range	9
6			Number Range	9

Expected IDoc

Expected result	Value
Outbound IDoc	0000000000000077
Control Record	FLCUSTOMER_CREATEFROMDATA
Data Segments	3 segments
E1SCU_CRE	1 field (2 sub-segments)
Switch to Simulation Mode	
E1BPSCUNEW	15 fields (No sub-segments)
Customer name	FOO
Form of address	FIRMA
Street	DIETMAR-HOPP-ALLEE 999
PO Box	
Postal Code	69190
City	WALLDORF
Country Indic.	DE
ISO country code	DE
Region	
Tel. no.	06227-34-0
E-Mail Address	INFO@BASISTECHNOLOGIES.COM
B/P customer	B
Discount (%)	10
Language Key	D
Lang. (ISO 639)	DE
E1BPPAREX	5 fields (No sub-segments)
BAPI table extension struc	
Data	
Data	
Data	
Data	

Actual IDoc

Actual result	Value
Outbound IDoc	0000000000000089
Control Record	FLCUSTOMER_CREATEFROMDATA
Data Segments	3 segments
E1SCU_CRE	1 field (2 sub-segments)
Switch to Simulation Mode	
E1BPSCUNEW	15 fields (No sub-segments)
Customer name	FOO
Form of address	FIRMA
Street	DIETMAR-HOPP-ALLEE 999
PO Box	
Postal Code	69190
City	WALLDORF
Country Indic.	DE
ISO country code	DE
Region	
Tel. no.	06227-34-0
E-Mail Address	INFO@BASISTECHNOLOGIES.COM
B/P customer	B
Discount (%)	10
Language Key	D
Lang. (ISO 639)	DE
E1BPPAREX	5 fields (No sub-segments)
BAPI table extension struc	
Data	
Data	
Data	
Data	

IDoc investigate screen

> ✻ The green indicator next to the linkage in the lower left part of the screen indicates that the validation of the recorded IDoc with what happened in the playback has passed.

When the linkage in the lower left is selected, the right hand side appears with the recorded/expected IDoc shown on the left and the playback/actual IDoc on the right. You are able to see the IDoc control record (header) of each and the underlying segments and segment fields.

Recording inbound and outbound IDocs

To capture both inbound and oubtound IDoc's in your source system, you need to activate the two IDoc related recording enhancements. This is detailed in the following earlier section on General Enhancements -> Enhancements.

Once captured in the recording, these linkages will be visible as either “Inbound IDoc” or “Outbound IDoc” linkages in the **Business Transaction Linkage Explorer**. After transferring to the Repository, these same linkages will be found within the **Test Script Linkage Explorer**.

Playing back and comparing IDocs

During the playback, the same IDocs will be captured and then compared to what happened in the recording. You must activate the playback enhancement to achieve this otherwise you will always have an “IDoc missing” failure reason since no IDoc’s will be captured at all.

Additional Notes

You can deactivate the comparison of the IDoc segment data if you expect to see differences between the IDoc data in the recording versus the playback. This would typically happen if such fields as time-stamps, unique identifiers or GUID’s are contained within the segment data. This parameter is explained in the earlier section on Configuration Parameters.

> ! Note that you are now able to “suppress” certain fields from the comparison of the expected IDoc and the actual IDoc. These configuration must be entered into the central system, table /BTI/AUT_C_CHIS. This allows you to either include or exclude certain IDoc segment fields from the comparison for a particular IDoc message type.

Pre-playback Simulation

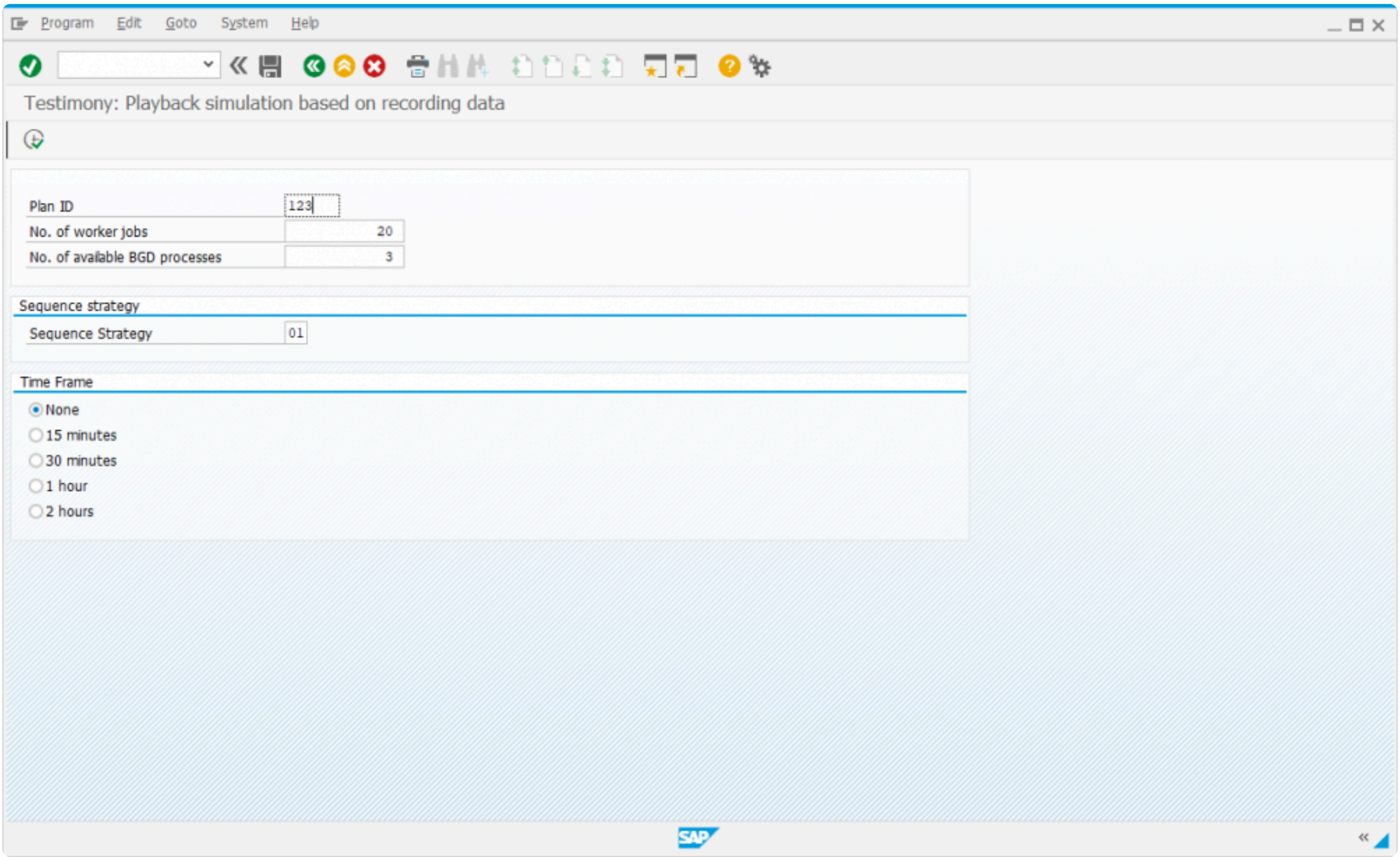
With Tesitmony v2.21 a number of enhancements have been made to the playback simulation program to allow you to understand the requirement on the bots prior to building the execution queue. In this version of the pre-playback simulation, you must still have created a recording, and it is on the data in this recording that the pre-playback simulation will process.

The key output of the pre-playback simulation is to give you a heads up on the expected run-time of the playback and how many bots you will require.

The program name is **/BTI/AUT_EARLY_PLAYBACK_SIM**. It should be run upon the central system only. You specify the test plan ID and the number of worker jobs you have available for use in the central system to facilitate the playback. You should also specify how many background jobs you expect to have available on the target system when you run the playback.

The sequencing strategy should be set to 02 (full throttle) unless for smaller playbacks you intend to use sequencing strategy 01. You can also specify the time frame to obtain an estimate on what the playback will do every N minutes.

A sample of the select-options for the program is shown below:



Testimony: Playback simulation based on recording data

Plan ID	123
No. of worker jobs	20
No. of available BGD processes	3

Sequence strategy

Sequence Strategy	01

Time Frame

● None
○ 15 minutes
○ 30 minutes
○ 1 hour
○ 2 hours

Pre-playback Simulation Program

Outbound RFC Analysis Program

As a pre-cursor to ramping up outbound RFC service virtualization, v2.21 has a built-in analysis program that lets you analyze your production (source) systems outbound RFC calls.

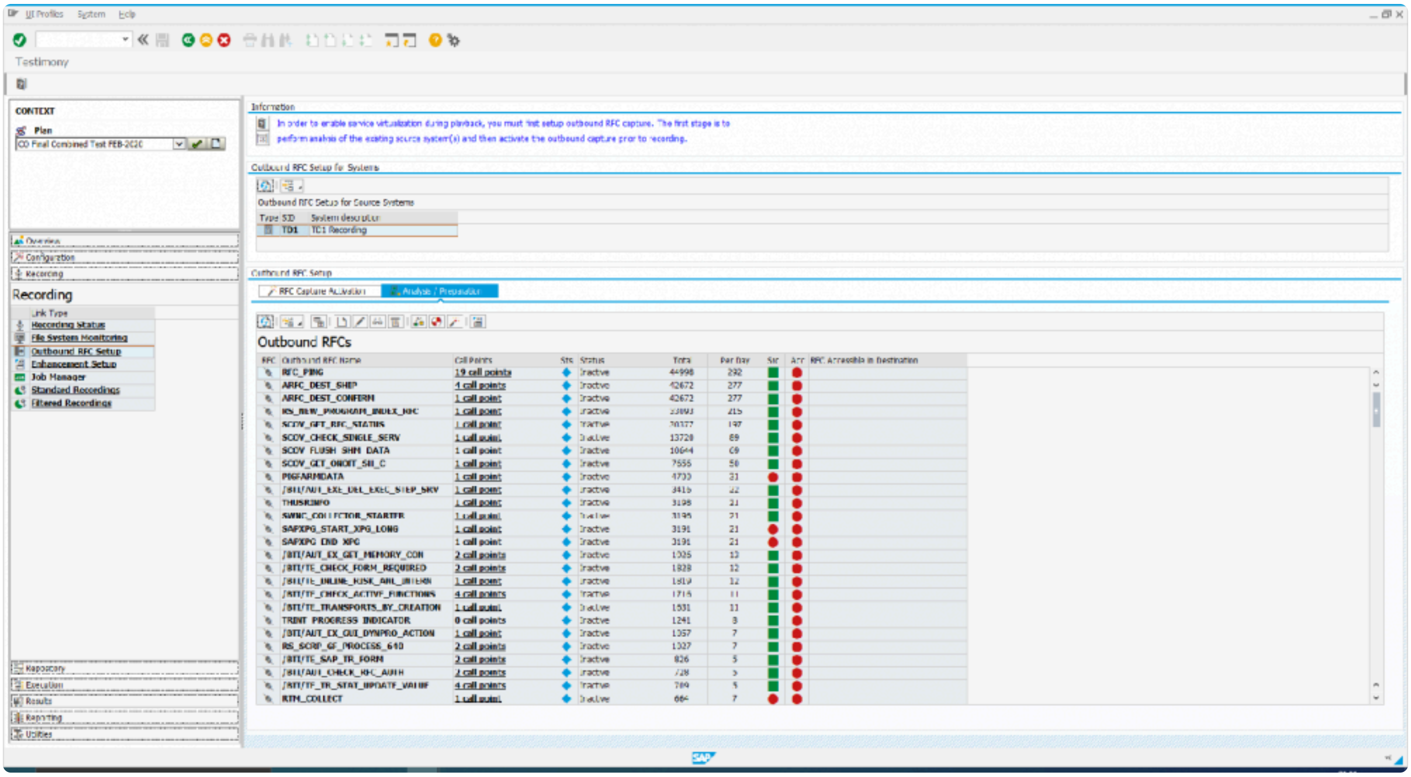
It is important for us to know the following about your system before deciding on whether we can support your outbound RFC service virtualization aspirations:

1. Which RFC's are called?
2. Via which RFC destinations?
3. When and with what volumes?
4. To which systems are these calls made?
5. Are those external systems SAP servers?
6. Are we able to request additional information from those external systems?

To gather the answers to the above questions, a new program has been created that interrogates your systems usage data and prepares the above information.

The program is called **/BTI/AUT_ORFC_STAT_COLLECT**. and must be run upon the central system only. You specify the STAD data parameters that are to be analyzed including the time period of analysis.

Once the program has been executed, the results can be seen in the output. However, a more user friendly version of this is available within the "Outbound RFC Setup" section of the "Recording" sub-menu.



CO Final Combined Test FEB-2020

Recording

Link Type
Recording Status
File System Monitoring
Outbound RFC Setup
Enhancement Setup
Job Manager
Standard Recordings
Filtered Recordings

Information

In order to enable service virtualization during playback, you must first setup outbound RFC capture. The first stage is to perform analysis of the existing source system(s) and then activate the outbound capture prior to recording.

Outbound RFC Setup for Systems

Outbound RFC Setup for Source Systems

Type	SID	System description
	TD1	TC1 Recording

Outbound RFC Setup

Outbound RFCs

RFC	Outbound RFC Name	Call Points	Sts	Status	Total	Per Day	Sir	Acc	RFC Accessible in Destination
	RFC_PING	19 call points	◆	Inactive	44998	292	🟩	●	
	ARFC_DEST_SHIP	4 call points	◆	Inactive	42672	277	🟩	●	
	ARFC_DEST_CONFIRM	1 call point	◆	Inactive	42672	277	🟩	●	
	RS_NEW_PROGRAM_INDEX_RFC	1 call point	◆	Inactive	33093	215	🟩	●	
	SCOV_GET_RFC_STATUS	1 call point	◆	Inactive	30377	197	🟩	●	
	SCOV_CHECK_SINGLE_SERV	1 call point	◆	Inactive	13720	89	🟩	●	
	SCOV_FLUSH_SHM_DATA	1 call point	◆	Inactive	10644	69	🟩	●	
	SCOV_GET_ONOFF_SH_C	1 call point	◆	Inactive	7555	50	🟩	●	
	PIGFARMDATA	1 call point	◆	Inactive	4700	31	●	●	
	/BTI/AUT_EXE_DEL_EXEC_STEP_SRV	1 call point	◆	Inactive	3415	22	🟩	●	
	THUSRINFO	1 call point	◆	Inactive	3198	21	🟩	●	
	SWNC_COLLECTOR_STARTER	1 call point	◆	Inactive	3195	21	🟩	●	
	SAPXPG_START_XPG_LONG	1 call point	◆	Inactive	3191	21	●	●	
	SAPXPG_END_XPG	1 call point	◆	Inactive	3191	21	●	●	
	/BTI/AUT_EX_GET_MEMORY_CON	2 call points	◆	Inactive	1925	13	🟩	●	
	/BTI/TE_CHECK_FORM_REQUIRED	2 call points	◆	Inactive	1828	12	🟩	●	
	/BTI/TE_ONLINE_RISK_ANL_INTERN	1 call point	◆	Inactive	1819	12	🟩	●	
	/BTI/TE_CHECK_ACTIVE_FUNCTIONS	4 call points	◆	Inactive	1715	11	🟩	●	
	/BTI/TE_TRANSPORTS_BY_CREATION	1 call point	◆	Inactive	1531	11	🟩	●	
	TRINT_PROGRESS_INDICATOR	0 call points	◆	Inactive	1241	8	🟩	●	
	/BTI/AUT_EX_GUI_DYNPRO_ACTION	1 call point	◆	Inactive	1057	7	🟩	●	
	RS_SCRP_GF_PROCESS_640	2 call points	◆	Inactive	1027	7	🟩	●	
	/BTI/TE_SAP_TR_FORM	2 call points	◆	Inactive	826	5	🟩	●	
	/BTI/AUT_CHECK_RFC_AUTH	2 call points	◆	Inactive	728	5	🟩	●	
	/BTI/TE_TR_STAT_UPDATE_VALUE	4 call points	◆	Inactive	709	5	🟩	●	
	RTM_COLLECT	1 call point	◆	Inactive	664	7	●	●	

Outbound RFC Analysis

Other Product Changes

The following additional changes have been made in the Testimony v2.21 release.

Testimony Functionality	Enhancement that has been done
Auto-clicker for pop-ups	During long and complex playbacks, popups on certain transaction codes would appear and block the playback. An example is the network graphic in transaction C202 (Change/Display master recipe). The bot now automatically closes these windows if it can so you do not need to constantly monitor and look for blocking popups.
External session not found issue	The bot will now login automatically when a user session is not found thus removing this technical error altogether.
Batch job log evaluation method	New methods of batch job log evaluation dependent upon customer requirements – see the details in the new general parameters section for parameter BATCH_EVALUATION.
New profile parameter check	The key additional profile parameter we have added is to ensure that “multiple” logins are allowed for a user on the target system.
New Bot checks	The playback check step to ensure the bots are all correctly setup now also perform the following additional checks: • Correct theme is set on the bot • SAP GUI history is turned off • Bot executable is “authorized” (SAP GUI configuration) • IE security setting is correct • Bot machine screen resolution is “sufficient”
Defect Management extensions	Additional fields have been added to the defect management grid. The message (if any) can be immediately seen in the grid. With the change layout you can also add in the message class, number and type. The “Root cause analysis” flag is also available within the grid as well as being a new filter option.
Dynamic ID linkages exposed	The user can now see the dynamic ID’s that are created and whether they are “producers” or “consumers”. These are also now available within the new version of the investigate screen.
Batch job spool linkages	Testimony now captures the batch job spool output (lists) during both the recording and the playback. These are currently not compared but are visible within the linkage explorer and investigate screen.
Add bots on the fly during playback	Since bots running out of memory can now pause the playback, it is now possible to add bots into the landscape and resume with them. You can start up bots while the queue is paused. Once started and connected to the central system, you will see them in the Active bots in the monitoring section. Click on them and connect them (mark as active). Then resume the

	playback.
Bot RFC sleep mode	It had been seen on some playbacks that the bots would go into a “sleep” mode such that RFC calls to them were “queued” and would not be run until the bot executable was brought into focus. This is now resolved and you will see the bot (in the logs) sort this issue out on start-up.
Bot version information	Within the supporting infrastructure, those bots that are “active” will now display their bot version in the grid display. Before you start the playback, you can ensure that the bots are all on the expected version.
Generation of bot configuration file	From the supporting infrastructure, you can now generate the bot XML configuration file automatically. You will still need to enter the username and password that the bot needs to use to logon and register on the central system (either in the XML file or on bot startup).
Test plan filtering	Within the menu path Configuration -> Test Plans, the list of test plans can now be filtered extensively. You can restrict the list of test plans by various filter options.
Supporting Infrastructure filtering	Within the bot supporting infrastructure, various filter options are now available to restrict the list of bots displayed.
Copying bot setup	Within the supporting infrastructure, if you are setting up many bots in preparation for a playback, you now have the option to “copy” an existing bot entry. You will still to specify the unique Bot ID as well as the machine name.
Most Frequent Object Sorting	After a playback has completed, one of the best places to see the results of the playback is to go to the “Most Frequent Objects” grid within the Playback Overview. From here you can now sort by the “Success “ per object type and focus in on those objects that are not 100 successful.
Manual dependency configuration	It is now possible to configure thta certain (low volume) transactions must be run prior to other transactions running. For example, this might be for month-end dialog transactions running prior to batch jobs or stock replenishment jobs running prior to stock level transactions running. Please liaise with Basis Technologies delivery and support when configuring this as it is not appropriate for high volume objects.
Dynamic ID and copying of queues	Previously if you copied an execution queue, the dynamic ID generation on that queue would need to be run again. Now the process of copying the queue will also copy across the dynamic ID’s, thus you no longer need to run this again.
Dynamic ID performance	The performance of the dynamic ID generation program has been significantly increased by a factor of at least 5 (i.e. 5 times faster). Performance issues were previously seen on large recordings and execution queues which should now be resolved.
Bot Logging	Extended information on what the bot is doing at any one time is now output to the bot logs.
Launch Investigate Screen from Defect list	From the defect management list display, the user can now launch directly into the investigate screen. If there is more than 1 associated script failure, the first is selected and this is the script that the investigate screen will display.
Defect list shows number of	The number of associated failed scripts to the defect is now displayed in the defect management list.

failures	
Orphaned Logins	When using sampling or exclusions, it is possible that a user logs in but then has all of their scripts excluded. Thus, we would log the user on and leave them logged in during the playback. These orphaned logins are now removed prior to the playback.
Manually trigger data transfer	If there is an issue after the recording is deactivated, it is now possible to manually re-trigger the data transfer process.

Notes on S/4 HANA Systems

Testimony is built to function on a central system which records one or more source systems and plays back that recording into one or more target systems. These 3 system types would typically be separate systems. All of the systems must be ABAP stack and on Netweaver release 7.01 and above.

In the case of S/4 HANA systems (1610, 1709, 1809 and 1909), it is possible to install Testimony for recording and playback purposes. The central system would traditionally be a separate Solution Manager system.

Before you record your S/4 HANA system, please liaise with Basis Technologies who will provide you with an additional transport request that should be applied to both your central system and your source S/4 HANA system. The same transport should then be applied to your S/4 HANA playback system prior to starting a playback.

Bug Fixes

The following bugs have been addressed in the Testimony v2.21 release. Please note that this is not an exhaustive list of bug fixes, it is purely intended as a summary of the main issues reported by existing customers in the most commonly used areas of the tool.

Testimony Functionality	Bug that has been fixed
Playback Summary Generation	At the end of a playback, the playback summary was not being automatically generated. This is now resolved.
Editing Defect comments	A fix was implemented for editing defect comments that sometimes threw an exception.
Progress in bot monitoring UI	A minor fix to the progress indicator when refreshing the bot monitoring grid.
Prevent multiple bot instances	The bot executable could previously be started up on the same machine under the same Windows user leading to anomalies in the playback. This has now been prevented.
Resuming after midnight boundary	When not enough time was left in the playback prior to midnight, the playback could not be resumed since it would immediately pause again. This is now resolved.
Scripts incorrectly run on next day	In some cases, scripts were incorrectly run on the following day after the midnight boundary was reached. This no longer happens.
Step level suppressions created defectsl	Step level suppressions are now correctly set to a state of passed and will no longer create defects.
Missing authorization prep step failure	A missing authorization object in the default provided role /BTI/AUT_SOURCE_RFC was causing a preparation step to fail. This is now resolved.