Automatic Interface Regression Tests for SAP middleware and SAP Backend systems
Introduction to Interface Testing Tool (int4 IFTT) is an int4 software product for automatic SAP interface testing. It is provided as ABAP add-on installed on backend system.

- Officially certified by SAP:
  - has been certified for integration with SAP NetWeaver 7.40 via the SAP integration scenario ABAP Add-On Deployment for SAP NetWeaver.
  - has been certified for integration with SAP S/4HANA on-premise edition 1511 via the SAP integration scenario ABAP Add-On Deployment for SAP S/4HANA.

- It fully tests **SAP interface development after any source code / configuration changes**
Interface testing - challenges

- Time consuming testing by manual replication of documents. Small number of test cases
- Tests of specific components (mostly PI mappings)
- Test results are limited to laborious and error prone checks
Benefits of using Quick and simple assertion rules setting.
- do it once - no need to change

- Decreased downtime for Integration architects, functional experts and developers

- Complete testing scope: middleware + backend system

- Reduced cost of external resources. No need to generate new data

- 100% document correctness. Validation based on final data

- Support for all project phases (waterfall / agile)

- More funds, time and resources available for improvements

- Decreased downtime for Integration architects, functional experts and developers

- Support for all project phases (waterfall / agile)
Features

- Creation of test cases based on existing documents
- Full SAP landscape test scope
- Single test case allows to verify all possible checks
- Document comparison performed on the DB level (per configuration)
Other functionalities of IFTT Interface Testing Tool:

- **Process oriented approach**
  - Categorizing test cases by business processes

- **Single test case and full scenario processing modes**

- **SAP PO adapter independent**
  - (MQ, SOAP, FTP, etc)

- **Testing both inbound & outbound scenarios**
  - Integration with ECATT

- **User friendly comparison OK/ FAILED report**
  - Comparison based on final business docs

- **Open architecture**
  - To support other integration platforms (HCI, AIF)
Testing scope

**Middleware layer** - SAP PO (mappings, data structures, BPM, adapter modules, etc.)

**Interface Program layer** in SAP backend (AIF, IDOC, BAPI, PROXY, custom ABAP)

**Configuration layer** (all customizing settings from transaction SPRO that may impact the interface)
Create test cases automatically by selecting business documents already created in the receiving application.

Run the test case and automatically validate the newly created business documents by comparing them with the original ones.
Testing Inbound interfaces with int4 IFTTT Interface Test Tool

1. Store test case
2. Run a test case
3. Automatic comparison of documents: Doc ID and Doc ID'

Any protocol

3rd Party System

SAP PO

SAP ERP

Get XML message

IDOC, PROXY etc

Doc ID

Doc ID

IDOC, PROXY etc

Doc ID'

Doc ID'

Resend input message

*External message ID is each time randomized
Testing Outbound Interfaces with

In order to **create a test case** firstly trigger the message by:

- posting the business document using an eCATT recording
- **OR**
- using another inbound interface*

Secondly use an outbound message to store the original XML and associated business object name for future assertions.

Run the test case and automatically validate XML.

*(i.e. inbound sales order triggers outbound sales order acknowledgement.)
Testing Outbound interfaces with

**SAP ECC**

- Business doc. Doc ID
- Business doc. Doc ID'

**int4 IFTT add-on**

1. **Store test case**
   (needed: ECATT name + SAP PO message number)

2. **Run a test case**
   Execution of an ECATT recording + search for XML in SAP PO

3. **Automatic comparison of final XML messages:**
   Doc ID and Doc ID'

**SAP PO**

- Any protocol
- Doc ID
- IDOC, PROXY etc

**3rd Party System**

- Any protocol
- Doc ID
- Doc ID'
- Doc ID''

Get XML after mapping
Screenshots

Test management

Detailed report of assertions for inbound interface*

Summarized execution report

Detailed report of assertions for outbound interface

*Presents selected fields of original document (lighter green) compared with the current document (darker).
int4 IFTT business objects represent assertions for business document as well as SAP PO technical details of interface (example: Sales invoice, inbound delivery, outbound delivery etc...)

For inbound interfaces the assertions are defined as a model of database tables and fields to be checked each time during test case execution. Usually they cover all aspects of business document, so there is no need to think about them during test case creation. This means that the results will be always very comprehensive, not limited to single checks (for example instead of checking only VAT, the whole invoice will be verified)

For outbound interfaces, the assertion is made based on comparison of original XML and the one produced during the test case execution with configured exception list managed by XPath expressions (for example the invoice number will be always different and not fail the test case)

Every test case must be associated with a single business object
eCATT integration

- **eCATT** is a standard built-in SAP tool. It offers a graphical user interface with ABAP script editor and its own command syntax. It allows for recording creation of business documents.

- **int4 IFTT** integrates with **eCATT** in order to:
  
  - Implement scenarios where the business process starts in SAP. A good example is testing an inbound delivery interface. Each time you need a fresh purchase order as SAP blocks goods receipt over the limit. The **eCATT** recording contains creation of particular purchase order and it is executed by **int4 IFTT** each time before inbound delivery test case execution.

  - Test outbound scenarios. Outbound scenarios need a trigger to create a message (IDoc, proxy, rfc etc). These messages are generated by recorded executions of business transactions. Hence **int4 IFTT** tests also all customizing and ABAP development (user-exits) needed to trigger outbound messages from SAP.

- Thanks to the **eCATT** integration all scenarios that require manual user actions are still fully automated.
Grouping dependent cases

- Test case = single business document
- Some test cases require preceding document to be executed
- int4 IFTT allows to group test cases and replicate the whole business flows
- It is possible to mix inbound and outbound interfaces and manual operations together
- Thanks to variable concept (part of business objects) test cases can pass their own document numbers between each other
Grouping dependent cases

Sample process:

1. Inbound sales order *(interface step)*
2. Outbound sales order confirmation *(interface step)*
3. execution of eCATT recording to create a delivery in reference to sales order
4. Outbound ASN *(interface step)*
5. execution eCATT recording to invoice the SO from step 1
6. Outbound invoice *(interface step)*
Testing outbound messages with

Prerequisite: The ICO (integrated configuration object) in the PI/PO needs to be set to store the message content after mapping, the one that will be delivered to the receiver.

Test case consists of two steps:

1) Action to trigger the message by eCATT posting of business document or by posting other inbound interface (ex. inbound sales order triggers outbound sales order ack.)

2) Outbound message itself to store the original XML and associated business object name for future assertions.
During the execution **int4 IFTT** automatically searches SAP PI/PO database of processed messages and by interface name and namespace stored in the business obj. definition and business document references given by previous step finds proper XML message. This message would be used for comparison with the original message stored during the test creation.

The assertion allows for exceptions. Exceptions are stored as XPath expressions in the obj. def. assigned to the test case. The exception might be: *creation date & time*, *business document number* etc.

Scope: ECC output determination, standard and custom ABAP routines to generate the message, SAP PI routing and mapping steps, RFC lookups, BPM

Out of scope: operations in outbound communication channel
Once created, interface test case may not be valid after implementing Change Requests to its functionality.

It can be updated following the procedure:

- Run the test case, the results will fail according to the current definition
- Validate & confirm new business document created by execution
- Update the test case by using current interface message as its base
Alternative use: Load generator

int4 IFTT can be used as an interface load generator tool:

- It supports mode where the messages from chosen test cases are sent to the middleware platform (SAP PI/PO) multiple times:

- It would use the standard method of configuration variables to generate unique document numbers and randomize the content (in limited way)

- Normally int4 IFTT tests only the SAP part of the integration flow, but with simple workaround the int4 IFTT can deliver messages outside SAP, for example to MQ (by creating separate interface in SAP PI and attaching it to int4 IFTT configuration). Such approach allows performing a real end to end performance testing.
In a typical project landscape:

**IFFT can be installed and used in:**

- **DEV**: used by Developers / Integration Architects / Functional Experts mostly during the development phase and unit testing but also for any interface related defect fix /CR implementation and retesting.

- **QA**: used by Integration Architects and Functional Experts during the Integration Testing and UAT. During the UAT all scenarios and test cases should be finalized and the regression testing should start on regular basis. Should be mandatory for all defect fixes and CRs to confirm if interfaces are working in the manner that was accepted and signed off by UAT.

- **TST**: This is a system the closest to production environment, should contain most comprehensive database of interface test cases that cover all business process operated globally by all sites (not only scope of current project). In TST the int4 IFTT is mostly operated by Run teams. The mandatory test runs should preceded any deployment to production of interface related changes and in particular any new site go-live.

- **int4 IFTT** is not intended and should be never used in production environment (even when deployed is disabled by checking the mandant attributes).
Parallel run using

Case study: Existing interfaces, due to incorrect implementation cause low data quality and high maintenance cost. No business involvement expected – business logic remains intact.

1. Automatic compare business documents posted using both - the new and the old interface – on two separate test systems in order to spot out possible inconsistencies.

2. Save time and resources with testing speed of 2,000 business documents in 1 minute!

3. Get your freshly tested interface running on the production system without engaging the business!

*(i.e. inbound sales order triggers outbound sales order acknowledgement.)
Executive summary

- Testing both the integration platform and the application systems in one go
- Quick and simple test case generation (just choose one of the existing business documents, no need to create from the scratch like for example in the Tosca Test Suite)
- Flexible configuration with pre-delivered content
- Testing does not involve time & resources of source systems’ resources
Executive summary

- **Define what needs to be checked only once** – results based on database entries and associated business objects

- **Support for Agile Methodology**, quick tests after each development cycle

- **Appliance both for development and support team**

- **Assurance for business system stability**

- **Nearly End to End testing** -> covers the whole SAP Landscape