

TOTSCo Bulletin No.59

Date: 20 May 2024

Subject: Guidance on JSON Validation

This bulletin has been written by the Industry Process Group to provide additional guidance on handling JSON (JavaScript Object Notation) messages, following queries received from a few RCPs and experience from testing. It has been observed that many RCPs have implemented strict schema validations that have caused messages to be overprocessed and then rejected rather than accepted.

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TOTSCo
May 2024

JSON Standards and Guidelines for use in One Touch Switch

As per Appendix 5 of the OTS Industry Process, JSON was adopted as the standard for messaging because it offers many benefits over XML, such as partial schema validation as well as adaptability without impacting existing systems and processes.

As the section further describes, JSON deserialization libraries typically have the ability to ignore unknown entities, so only elements understood by the processing system are interpreted and processed.

This principle is critical to the change control processes regarding OTS and the JSON message specification as managing any level of change control from an industry perspective is going to be almost impossible with potentially hundreds of RCPs exchanging messages and upgrading their systems over time.

Though not explicitly added into the specification, provision exists for RCPs to be able to provide additional content to the JSON messages that only certain RCPs may understand. The API and Message Specifications for OTS have tried to formalise the structures for this as much as we can recognise the needs as they are right now, but over time those will change and the ability to add new content to messages is a critical design choice behind the use of JSON.

It has been noted that many RCPs have implemented a strict schema validation policy, either in their applications or on firewalls, and that has the potential to pose problems to future updates to the schema and the ability for changes to be rolled out gradually.

Therefore, an updated version of the JSON schema definition has been created on swagger at the following URL that has explicit definitions that allow for unknown content to be provided and ignored by a CP if they are not expecting it.

<https://app.swaggerhub.com/apis/TOTSCO/letterbox/0.4.2#>

Looking at the definitions, there are now explicit references to support additional properties. What this means is that on parsing the incoming JSON documents, the known elements are validated against the schema definition, but if other elements are presented that the schema was not expecting they will not be rejected, but will also not be mapped to elements in your system or code. In effect they are ignored.

As new fields are added to the standard, the intention is that they only be added as optional fields to the current specification name. That way, they will still pass for anybody using an old version of the schema (backwards compatibility) using the additional properties directive, but for those that have updated their systems those properties could then be consumed and processed.

As per the change control standards, if new required properties are introduced, then a new message format specification will be added for that message with a version number. This allows for effective change control and for TOTSCo to identify and understand which RCP supports which message specifications.

A future update to the directory will include supported message specifications by RCP, but this is not required yet as every CP is working to the exact same standard.

This current version 0.4.2 as listed on swagger will be updated and maintained as the most complete version with regards to schema validations and it is recommended that all RCPs update to that version where they are using the JSON schema for processing their messages.

Even if an RCP does not make use of the schema from the swagger hub, they are required to adhere to the same standards as referenced in the appendix to the OTS process and not apply a strict message validation policy to the incoming JSON content. Rejecting a message because it includes fields that were not expected is not valid behaviour and will create considerable difficulties in maintaining code going forward.

Recommendations

If you are using the existing schema validation, consider updating to 0.4.2 as soon as possible, or apply a non strict validation (discard) policy for all unexpected JSON elements presented in any JSON message you receive. This should result in fewer messages being rejected through over validation and lead to more instances where messages are accepted and responded to asynchronously.

Testing

This is a simple process to test, you can use Postman or a manually created JSON message to send to your own systems or via the TOTSCo hub that contains extra JSON elements. If you are able to accept and process the message without failing due to the extra content being passed, then you have passed the test.

Future Considerations

In future, all updates to the JSON schema will follow the 0.4.2 definition as a baseline and therefore the support for additional properties will be part of the standard for all new updates. It will be simpler to adopt this standard now where possible rather than having to adopt this later on where you may end up unable to process messages if you have not updated your systems in time or have missed a process update.

