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Top 19 SOAP Interview Questions

by Alex Jones · Jul. 23, 18 · Integration Zone · Opinion

SOAP (Simple Object Access Protocol) is a technological specification designed to support Web services interface with other systems; without it, the Web services are unable to cross operate systems and platforms and often lack interoperability. Besides REST, SOAP has become increasingly popular for developers working on system integration based projects. For such reasons, it would be very useful for both freshers and senior professionals in the field to expand their general knowledge in SOAP API.

To help you learn more about SOAP under time constraints, either for technical interviews or for a new upcoming role, we have collected a comprehensive list related to common SOAP testing interview questions and answers. We do recommend you to spend some time reading through the list to ace the job interviews or well prepare for your new projects.

1. What are SOAP Web services?

SOAP is defined as an XML-based protocol. It is known for designing and developing web services as well as enabling communication between applications developed on different platforms using various programming languages over the Internet. It is both platform and language independent.

2. How does SOAP work?

SOAP is used to provide a user interface that can be accessed by the client object, and the request that it sends goes to the server, which can be accessed using the server object. The user interface creates some files or methods consisting of server object and the name of the interface to the server object. It also contains other information such as the name of the interface and methods. It uses HTTP to send the XML to the server using the POST method, which analyzes the method and sends the result to the client. The server creates more XML consisting of responses to the request of user interface using HTTP. The client can use any approach to send the XML, like the SMTP server or POP3 protocol to pass the messages or reply to queries.

3. When to use SOAP API?

Use the SOAP API to create, retrieve, update, or delete records, like accounts, leads, and use-defined objects. With more than 20 different calls, you can also use the SOAP API to manage passwords, perform searches, etc. by using the SOAP API in any language that supports web services.

4. How do users utilize the facilities provided by SOAP?

- is used to alter the address to the web page and has a default instance on the SOAP
- s used to allow the insertion of a complete XML document into the web page. It receives the XML file as an argument and transports the XML file to XML parser liaison, which reads it and inserts it into the SOAP call as a parameter.
- GetAddress(): It is used to get a query name and gets the result that best matches a query. The name is sent to the SOAP call in the form of text character string.
- GetAllListing(): It is used to return the full list in an XML format.

5. What is the major obstacle users faced when using SOAP?

When using SOAP, users often see the firewall security mechanism as the biggest obstacle. This block all the ports leaving few like HTTP port 80 and the HTTP port used by SOAP that bypasses the firewall. The technical complaint against SOAP is that it mixes the specification for message transport with the specification for message structure.

6. What are the various approaches available for developing SOAP-based web services?

There are two different methods available for developing SOAP-based web services, which are explained below:

- Contract-first approach: the contract is first defined by XML and WSDL, and then Java classes are derived from the contract.
- Contract-last approach: Java classes are first defined, and then the contract is generated, which is normally the WSDL file from the Java class.

“Contract-first” method is the most popular approach.

7. What are the elements of a SOAP message structure?

It is a common XML document that contains the elements as a SOAP message

- Envelope: It is an obligatory root element that translates the XML document and defines the beginning and end of the message.
- Header: It is an optional item which contains information about the message being sent.
- Body: It contains the XML data comprising the message being sent.
- Fault: It provides the information on errors that occurred while during message processing.

8. What are the syntax rules for a SOAP message?

- Must use encoded XML
- Envelope namespace must be used
- Encoding namespace must be used

- Must contain a DTD reference
- Should follow XML processing instructions

9. What is the transport method in SOAP?

Application layer and transport layers of a network are used by SOAP; HTTP and SMTP are the valid protocol of the application layer used as the transport for SOAP. HTTP is more preferable, since it works well with the current Internet infrastructure, in particular with firewalls.

The SOAP requests can be sent using an HTTP GET method while the specification only contains details about HTTP POST.

10. What are some important characteristics of a SOAP envelope element?

- SOAP message has a root Envelope element
- Envelope is an obligatory part of the SOAP message.
- If an envelope includes a header element, it should not contain more than one.
- Envelop version will change if the SOAP version changes.
- The SOAP envelope is indicated by the prefix ENV and the envelope element.
- The optional SOAP encoding is also specified using a namespace and the optional encoding style element.

11. What are the major functionalities provided by the SOAP protocol class?

The SOAP protocol is used to provide simple access methods for all the applications available on the Internet, providing the following functionalities:

- Call: A class which provides the main functionality for a remote method for which a call is needed. It is used to create the call() and to specify the encoding style of the registry that will be assigned when if necessary. This call() function is used by the RPC call, which represents the options of the call object.
- Deployment Descriptor: A class used to provide the information about the SOAP services. It enables easy deployment without the need for other approaches.
- DOM2 Writer: A class that serializes and uses DOM node as XML string to provide more functionalities.
- RPC Message: A class used as the base class that calls and replies to the request submitted to the server.
- Service Manager: A class that provides, lists and then outputs all SOAP services.

12. What are the web relation functionalities provided by SOAP protocol?

- HTTPUtils: This provides the functionality of the POST method to safely meet the requirements.
- Parameter: It is an argument for a RPC call used by both the client and the server.
- Response: It is an object that represents an RPC reply from both client and server, but the result will not be displayed until after the method call.

- TCPTunnel: It is an object that provides the ability to listen on a specific port and to forward all the host
- It helps to convert an object of one type into another type and this is called using the object.

13. How does the message security model allow the creation of SOAP more secure to use?

The security model includes the given security tokens. These tokens comprise digital signatures for protection and authentication of SOAP messages. Security tokens can be used to provide the bond between authentication secrets or keys and security identities. Security token uses the authentication protocols and an X.509 certificate to define the relationship between the public key and identity key. The signatures are used to verify the messages and their origin, generate knowledge to confirm the security tokens to bind the identity of a person to the identity of the originator. Security model prevents different attacks and can be used to protect the SOAP architecture.

14. What is the difference between the top-down and bottom-up approaches in SOAP Web services?

- Top-down SOAP Web services include creating WSDL document to create a contract between the web service and the client, with a required code as an option. This is also known as the Contract-first approach. The top-down approach is difficult to implement because classes must be written to confirm the contract defined in WSDL. One of the benefits of this method is that both the client and server code can be written in parallel.
- Bottom-up SOAP web services require the code to be written first and then WSDL is generated. It is also known as the Contract-last approach. Since WSDL is created based on the code, the bottom-up approach is easy to implement and client codes must wait for WSDL from the server side to start working.

15. What are the advantages of SOAP?

- SOAP is both platform and language independent.
- SOAP separates the encoding and communications protocol from the runtime environment.
- Web service can retrieve or receive a SOAP user data from a remote service, and the source's platform information is completely independent of each other.
- Everything can generate XML, from Perl scripts through C++ code to J2EE app servers.
- It uses XML to send and receive messages.
- It uses standard internet HTTP protocol.
- SOAP runs over HTTP; it eliminates firewall problems. When protocol HTTP is used as the protocol binding, an RPC call will be automatically assigned to an HTTP request, and the RPC response will be assigned to an HTTP reply.
- Compared to RMI, CORBA, and DCOM, SOAP is very easy to use.
- SOAP acts as a protocol to move information in a distributed and decentralized environment.

- SOAP is independent of the transport protocol and can be used to coordinate different protocols.

16. [illegible] advantages of SOAP?

SOAP is significantly slower than other types of middleware standards, including CORBA, because SOAP uses a detailed XML format. A complete understanding of these performance limitations before building applications around SOAP is hence required.

SOAP is usually limited to pooling and not to event notifications when HTTP is used for the transport. In addition, only one client can use the services of one server in typical situations.

If HTTP is used as the transport protocol, firewall latency usually occurs since the firewall analyzes the HTTP transport. This is because HTTP is also leveraged for Web browsing, and so many firewalls do not understand the difference between using HTTP within a web browser and using HTTP within SOAP.

SOAP has different support levels, depending on the supported programming language. For instance, SOAP supported in Python and PHP is not as powerful as it is in Java and .NET.

17. What are the differences between SOAP and REST?

SOAP	REST
SOAP is a protocol. SOAP was designed with a specification. **It includes a WSDL file which has the required information on what the web service does in addition to the location of the web service.**	**REST is an Architectural style in which a web service can only be treated as a RESTful service if it follows the constraints of being:** • **Client Server** • **Stateless** • **Cacheable** • **Layered System** • **Uniform Interface**
SOAP cannot make use of REST since SOAP is a protocol and REST is an architectural pattern.	**REST can make use of SOAP as the underlying protocol for web services, because in the end it is just an architectural pattern.**
SOAP only permits the XML format.	**REST permits many different data formats.**

SOAP based reads cannot be cached.	**REST reads can be cached.**
SOAP is like custom desktop application, closely connected to the server.	**A REST client is just like a browser and uses standard methods. An application has to fit inside it.**
SOAP is slower than REST.	**REST is faster than SOAP.**
It runs on HTTP but envelopes the message.	**It uses the HTTP headers to hold meta information.**

18. SOAP or Rest APIs, which method to use?

SOAP is the heavyweight choice for Web service access. It provides the following advantages when compared to REST:

- SOAP is not very easy to implement and requires more bandwidth and resources.
- SOAP message request is processed slower as compared to REST and it does not use web caching mechanism.
- WS-Security: While SOAP supports SSL (just like REST) it also supports WS-Security which adds some enterprise security features.
- WS-AtomicTransaction: Need ACID Transactions over a service, you're going to need SOAP.
- WS-ReliableMessaging: If your application needs Asynchronous processing and a guaranteed level of reliability and security. Rest doesn't have a standard messaging system and expects clients to deal with communication failures by retrying.
- If the security is a major concern and the resources are not limited then we should use SOAP web services. Like if we are creating a web service for payment gateways, financial and telecommunication related work, then we should go with SOAP as here high security is needed.

REST is easier to use for the most part and is more flexible. It has the following advantages when compared to SOAP:

- Since REST uses standard HTTP, it is much simpler.
- REST is easier to implement, requires less bandwidth and resources.

- REST permits many different data formats whereas SOAP only permits XML.
- Better support for browser clients due to its support for JSON.
- For performance and scalability, REST reads can be cached, SOAP-based reads cannot be
- If security is not a major concern and we have limited resources. Or we want to create an API that will be easily used by other developers publicly then we should go with REST.
- If we need Stateless CRUD operations then go with REST.
- REST is commonly used in social media, web chat, mobile services and Public APIs like Google Maps.
- RESTful service returns various MediaTypes for the same resource, depending on the request header parameter "Accept" as application/xml or application/json for POST and /user/1234.json or GET /user/1234.xml for GET.
- REST services are meant to be called by the client-side application and not the end user directly.
- ST in REST comes from State Transfer. You transfer the state around instead of having the server store it, this makes REST services scalable.

19. What are the factors that help to decide which style of Web services — SOAP or REST — to use?
Generally, REST is preferred due to its simplicity, performance, scalability, and support for multiple data formats.
However, SOAP is favorable to use where service requires an advanced level of security and transactional reliability.
But you can read the following facts before opting for any of the styles.

- Does the service expose data or business logic? REST is commonly used for exposing data while SOAP for logic.
- Requirement from clients or providers for a formal contract. SOAP can provide contract via WSDL.
- Support multiple data formats.
- Support for AJAX calls. REST can apply the XMLHttpRequest.
- Synchronous and asynchronous calls. SOAP enables both synchronous/ asynchronous operations whereas REST has built-in support for synchronous.
- Stateless or Stateful calls. REST is suited for stateless operations.
- Security. SOAP provides a high level of security.
- Transaction support. SOAP is good at transaction management.
- Limited bandwidth. SOAP has a lot of overhead when sending/receiving packets since it’s XML based, requires a SOAP header. However, REST requires less bandwidth to send requests to the server. Its messages are mostly built using JSON.
- Ease of use. REST-based application is easy to implement, test, and maintain.

Ready to Succeed

Tho stions may vary widely depending on the positions you apply for, we hope our list wou by giving you a comprehensive coverage of API testing and helping you to plan ahead for the t vs or get ready for your upcoming job interviews related to SOAP testing.

Wish you all luck and confidence in your testing career! Any suggestions would be more than welcomed to make our list better and more adequate to all testers.

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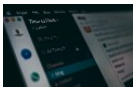

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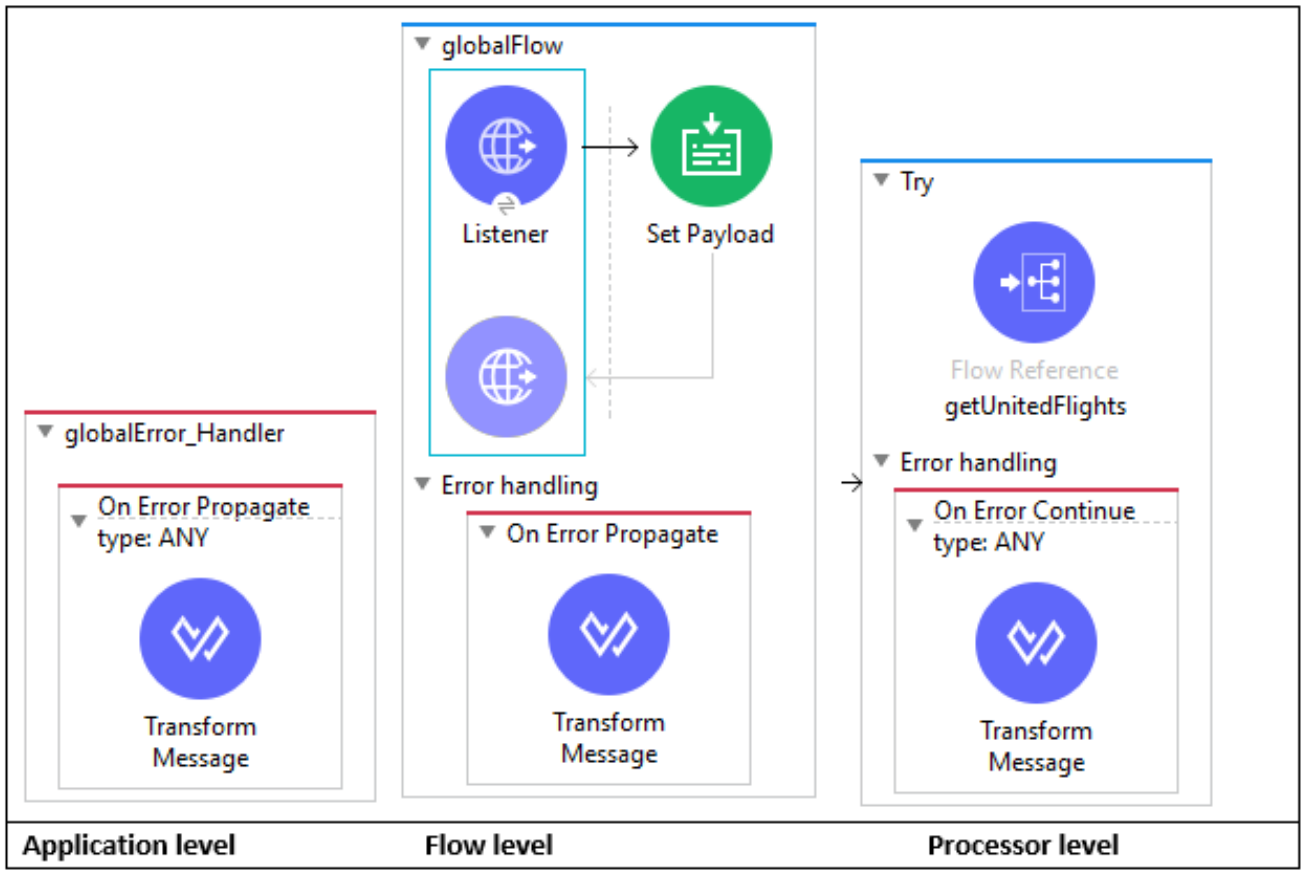
Error Handling in Mule

by Mansi Shanbhag · Sep 18, 18 · Integration Zone · Tutorial

The new Error Handling is one of the major changes introduced in Mule 4. It's better and more efficient. Although it may seem complex to some, it's made complex for good.

To begin with, the message exceptions can now be handled at 3 different levels i.e. application, flow, and processor levels, as shown below.



The handlers written at the application level are global handlers, which can be used to handle the errors thrown by any flow, which doesn't have its own error handling.

If there is no error handling written at any of the levels, the Mule Default Error Handler is used, which stops the execution of the flow and logs the exception.

The Mule Default Error Handler is not configurable but, can be replaced by our own Global error handler by creating a Configuration global element.

About Error Objects

Every error that is thrown, creates an Error object named as follows — Namespace (eg. HTTP) and Identifier (eg. BAD_REQUEST)

Eg. HTTP: BAD_REQUEST, WSC: CONNECTIVITY, VALIDATION: INVALID_BOOLEAN

Each [illegible] 2 properties:

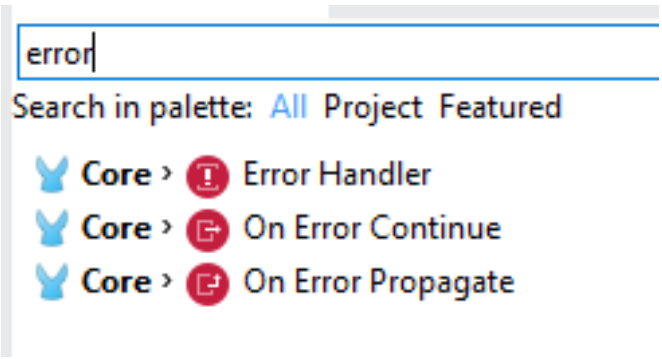
- — an object holding the Namespace and identifier
- error.description — a string holding the error message

All the errors follow a Hierarchy as shown below. “ANY” is the most Generic parent.

```
{
  "parentErrorType": {
    "parentErrorType": {
      "parentErrorType": {
        "parentErrorType": null,
        "namespace": "MULE",
        "identifier": "ANY"
      },
      "namespace": "MULE",
      "identifier": "VALIDATION"
    },
    "namespace": "VALIDATION",
    "identifier": "VALIDATION"
  },
  "namespace": "VALIDATION",
  "identifier": "INVALID_BOOLEAN"
}
```

About Error Handler Scopes

There are two error handler scopes in Mule 4, i.e., On Error Continue and On Error Propagate, which can be used to handle different kind of errors at all three levels.



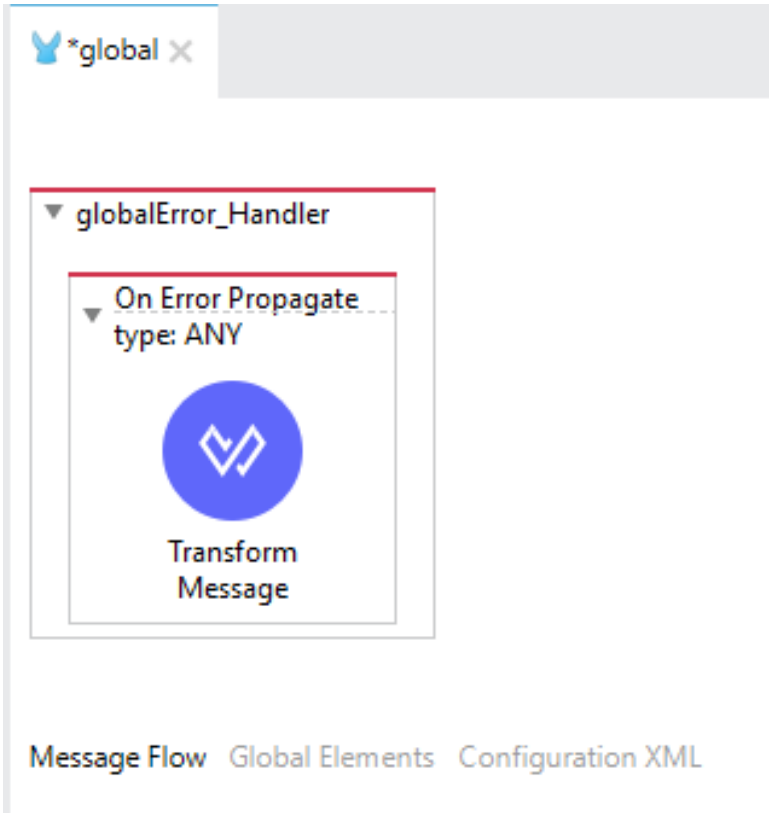
The ON ERROR CONTINUE scope always returns a **success** response to the next level, while the ON ERROR PROPAGATE always propagates the error to the next level and returns an **error** response to the next level.

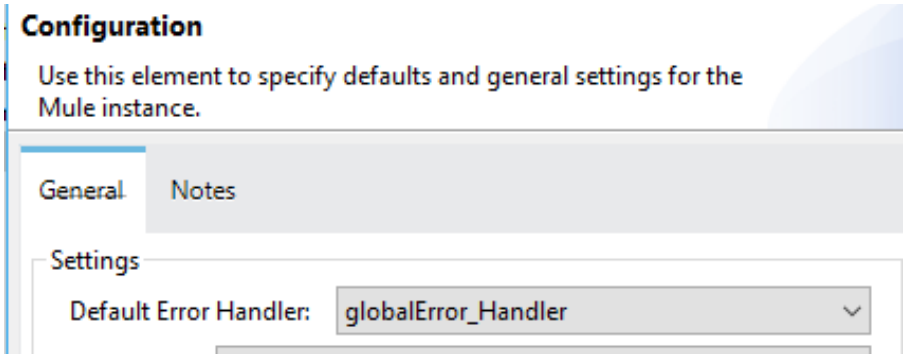
Each scope can have one or more message processors.

Al bal Handlers

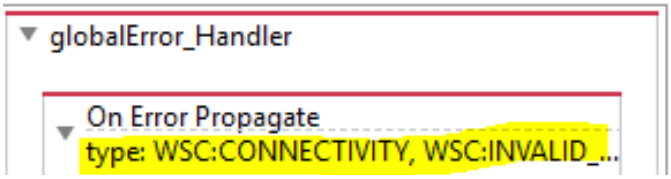
To handle errors at the application level, add an error handler in the global.xml (or simply outside a flow).

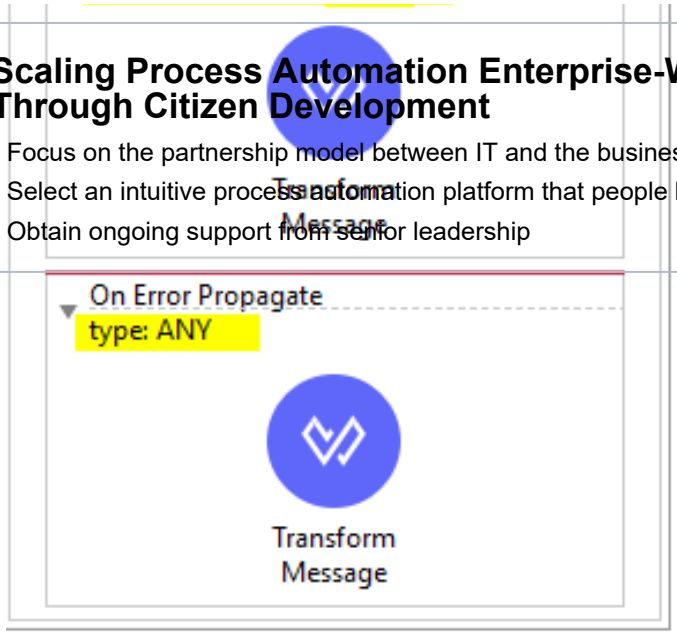
Then, create a Configuration element in the global elements, which sets the Global Error Handler as the Default Error Handler.





To create a generic handler for handling all the errors, specify the TYPE as “ANY” in the error scope of the Global Handler. To handle multiple errors, different type, or errors separately, specify the errorType of the error in the Type box of the error scope.





The error will be handled by the first scope, which meets the errorType.

About Flow Level Handlers

Flow level handlers can be added to regular Flows and private flows, but not to Subflows.

If an error that is thrown in the flow, doesn't find a matching scope for its errorType in the Flow's error scopes, it DOES NOT go to the application level handler, instead, it uses the Mule Default Error Handler.

About Processor Level Handlers

To handle the errors at the processor level, add one or more processors into a Try Scope and handle it using the On Error Propagate or On Error Continue Scopes.

The error scopes at the processor level take precedence over flow-level scopes. Flow-level scopes take precedence over application-level scopes.

It would be a good idea to have an error scope with Type specified as ANY in each level to avoid getting unexpected errors propagated to next levels.

Finally, the most important and challenging part of the new error handling is to choose between On Error Propagate and On Error Continue Scopes. Select them according to the business requirement or logic. For eg.: If you want the child flow to return a success to parent flow so that the parent flow continues, use On Error Continue. Similarly, use On Error Propagate when you may want the error to be propagated from child flow to parent flow and return an error response.

Topics: MULESOFT, INTEGRATION, TUTORIAL

Proven Ways to Speed Data Integration

by Janet Jaiswal MVB · **Sep 18, 18 · Integration Zone · Analysis**

Data integration is a challenge that keeps getting more difficult. It's no surprise considering the explosion of cloud-based tools, the proliferation of devices that consume and produce information, and the way information is shared between systems and from systems to humans. Plus, IDC predicts that the volume of data will reach around 40 Zettabytes (1 billion Terabytes equals 1 Zettabyte) by 2020 — and that 90 percent of it will be unstructured.

This rapid growth of data is making legacy data integration technology nearly unusable.

Custom Code Is Onerous

Let's explore why this is so. Organizations must address four key steps during the data migration and integration process:

1. **Capture** data that supports both the known use cases as well as future undefined use cases (think IoT data to support a future machine learning enabled use case).
2. **Conform** inbound data to corporate standards to ensure governance, quality, consistency, regulatory compliance, and accuracy for downstream consumers.
3. **Refine** data for its eventual downstream application and/or use cases (once it has been captured and conformed to corporate standards).

4. **Delivery** of data needs to be broad and prepared to support future unknown destinations.

For [illegible] ndled data integration by writing volumes of custom code. This onerous task has only grow[illegible] with the rise in SaaS applications and the constant product releases that are changing data [illegible]f the Internet of Things, and the proliferation of mobile devices.

In most organizations, the IT integration backlog feels insurmountable. It should only take days to deploy a tactical or departmental data warehouse solution. Yet it often takes months. Even enterprise-wide data transformation projects which should take months often last years. Both the deployment and the costs to maintain all the integrations are overwhelming most IT organizations.

Enter Modern Integration Platforms

Fortunately, the days are long gone when IT needed hundreds of coders to create an extract, transform, load (ETL) process and then maintain it by writing more code. Modern integration platforms eliminate the need for custom coding. In fact, they make it possible to deploy and scale data integration projects as much as ten times faster.

These platforms ease data integration pain because they're designed for flexibility and easy deployment for any project. The best of these features a drag-and-drop UX coupled with a powerful platform and hundreds of pre-built connectors out of the box. In fact, they largely leave data in place, and instead access and transform data where it resides, regardless of its structure (or lack thereof) and location.

Plus, because the connectors are always up-to-date, the IT organization avoids updating each integration every time its updated. This saves an incredible amount of time, money, and frustration across IT and all its projects.

Know What to Look For

While integration platforms are a proven way to streamline data integration, not all these platforms are created equal.

- Some are good at simple point-to-point cloud app integrations while others are good at moving and transforming large and complex data into a data lake for advanced analytics.
- Some require extensive developer resources to hand-code APIs while others provide self-service, drag-and-drop offerings that can be used by IT and business leaders alike.
- Some are best for specific tactical projects while others are more fitting as a strategic, enterprise-wide platform for multi-year digital transformation projects.

As your organization considers its options, understand how and who needs to be empowered with data integration capabilities. Then match your requirements to the most relevant solution.

If you're ready to migrate to Microsoft Azure for a cloud data warehouse, download our guide on how to choose the right integration approach.

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Please Refer the Engineer from Your API Team to This Story

by Kin Lane MVB · Sep 17, 18 · Integration Zone · Opinion

The new Gartner Critical Capabilities report explains how APIs and microservices enable digital leaders to deliver better B2B, open banking and mobile projects.

I reach out to API providers on a regular basis, asking them if they have an OpenAPI or Postman Collection available behind the scenes. I am adding these machine-readable API definitions to my index of APIs that I monitor, while also publishing them out to my API Stack research, the API Gallery, APIs.io, work to get them published in the Postman Network, and syndicated as part of my wider work as an OpenAPI member. However, even beyond my own personal needs for API providers to have a machine-readable definition of their API and helping them get more syndication and exposure for their API, having a definition present significantly reduces friction when on-boarding with their APIs at almost every stop along a developer's API integration journey.

One of the API providers I reached out to recently responded with this, "I spoke with one of our engineers and he asked me to refer you to https://developer.[company].com/". Ok. First, I spend over 30 minutes there just the other day. Learning about what you do, reading through documentation, and thinking about what was possible — which I referenced in my email. At this point, I'm guessing that the engineer in question doesn't know what an OpenAPI or Postman Collection is, and they do not understand the impact these specifications

are having on the wider API ecosystem, and lastly, I'm guessing they don't have any idea who I am (ego taking cont[illegible] provides me with the signals I need to make an assessment of where any API is in their over[illegible]nstrating to me that they have a long ways to go when it comes to understanding the wid[illegible]n which they are operating in, and they are too busy to really come out of their engineering box and help their API consumers truly be successful in integrating with their platform.

I see this a lot. It isn't that I expect everyone to understand what OpenAPI and Postman Collections are, or even know who I am. However, I do expect people doing APIs to come out of their boxes a little bit and be willing to maybe Google a topic before responding to a question or maybe Google the name of the person they are responding to. I don't use a gmail.com address to communicate, I am using apievangelist.com, and if you are using a solution like Clearbit or another business intelligence solution, you should always be retrieving some basic details about who you are communicating with before you ever respond. That is, you do all of this kind of stuff if you are truly serious about operating your API, helping your API consumers be more successful and taking the time to provide them with the resources they need along the way — things like an OpenAPI, or Postman Collections.

Why Was This Response so Inadequate?

- **No API Team Present** — It shows me that your company doesn't have any humans their to support the humans that will be using your API. My email went from general support to a backend engineer who doesn't care about who I am, and about what I need. This is a sign of what the future will hold if I actually bake their API into my applications — I don't need my questions lost between support and engineering, with no dedicated API team to talk to.
- **No Business Intelligence** — It shows me that your company has put zero thought into the API business model, on-boarding, and support process. Which means you do not have a feedback loop established for your platform, and your API will always be deficient of the nutrients it needs to grow. Always make sure you conduct a lookup based upon on the domain, or Twitter handle or your consumers to get the context you need to understand who you are talking to.
- **Stuck In Your Bubble** — You aren't aware of the wider API community, and the impact OpenAPI and Postman are having on the on-boarding, documentation, and other stops along the API lifecycle. Which means you probably aren't going to keep your platform evolving with where things are headed.

Why Should You Have an OpenAPI and Postman Collection?

- **Reduce Onboarding Friction** — As a developer, I won't always have the time to spend absorbing your documentation. Let me import your OpenAPI or Postman Collection into my client tooling of choice, register for a key, and begin making API calls in minutes or seconds. Make learning about your API a hands-on experience, something I'm not going to get from your static documentation.
- **Interactive API Documentation** — Having a machine-readable definition for your API allows you to easily keep your documentation up to date, and makes it a more interactive experience. Rather than just reading your API documentation, I should be able to make calls, see responses, errors, and other elements I will need to truly understand what you do. There are plenty of open source interactive API

elements I will need to truly understand what you do. There are plenty of open source interactive API [illegible] solutions that are driven by OpenAPI and Postman, but you'd know this if you were [illegible]er landscape.

- **[illegible] and Other Code** — Please do not make me hand code the integration with each of your API endpoints, crafting each request and response manually. Allow me to autogenerate the most mundane aspects of integration, allowing OpenAPI and Postman Collection to act as the integration contract.
- **Discovery** — Please don't expect your potential consumers to always know about your company, and regularly return to your developer.[company].com portal. Please make your APIs portable so that they can be published in any directory, catalog, gallery, marketplace, and platform that I'm already using, and frequent as part of my daily activities. If you are in my Postman Client, I'm more likely to remember that you exist in my busy world.

These are just a few of the basics of why this type of response to my question was inadequate, and why you'd want to have OpenAPI and Postman Collections available. My experience on-boarding will be similar to that of other developers, it just happens that the application I'm developing are out of the normal range of web and mobile applications you have probably been thinking about when publishing your API. But this is why we do APIs, to reach the long tail users and encourage innovate around our platforms. I just stepped up and gave 30 minutes of my time (now 60 minutes with this story) to learning about your platform and pointing me to your developer.[company].com page was all you could muster in return?

Just like other developers will, if I can't onboard with your API without friction, and I can't tell if there is anyone home, and willing to give me the time of day when I have questions, I'm going to move on. There are other platforms that will accommodate me. The other downside of your response, and me moving on to another platform, is that now I'm not going to write about your API on my blog. Oh well? After eight years of blogging on APIs, and getting 5-10K page views per day, I can write about a topic or industry and usually dominate the SEO landscape for that API search term(s) (ego still has control). But...I am moving on, no story to be told here. The best part of my job is there are always stories to be told somewhere else, and I get to just move on and avoid the friction wherever possible when learning how to put APIs to work.

I just needed this single link to provide in response to my email response before I moved on!

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