

# **Zero Touch Partnering (ZTP) Guide**

## **and ZTP API Component Suite**

A BUYER may on board, discover, integrate, qualify, order and manage products & services from a SUPPLIER with complete flow through and without any IT work. This needs to be a key objective of our industry so that geographically and product constrained Telco's can retain and grow revenues. Zero Touch Partnering will allow communities of service providers to partner seamlessly to provide maximum value and convenience to customers achieving one of the key objectives of TMForum Open Digital Architecture.

## Contents

Introduction .....	3
Scope of B2B API Usage .....	3
Characteristics of ZTP APIs.....	4
Discoverable.....	4
Dynamic .....	4
Security .....	5
Target API Suite for B2B Partner Integration.....	5
Request to Quote.....	6
Order to Activate .....	7
Trouble to Solution .....	8
Usage to Payment.....	9
Extension to TMForum Assets .....	10
Industry Proof Projects .....	10
References .....	10
Appendix 1 – Kuala Lumpur 2018 Catalyst Project .....	11
Appendix 2 – Meta Data Attachments.....	11
Appendix 2a - TR254_Dynamic_API_Technical_Recommendation_R15.5.1 .....	11
Appendix 2b 2014 B2B2X Service Bundling Catalyst Findings Paper.....	11
Appendix 2c – Sample messages from 2017 Partnering Platform.....	11
Appendix 3 – ZTP OAUTH Implementation Specification .....	11

## Introduction

With the rise of global platform businesses, a key characteristic, which is shared by the most successful platforms is that they expose Open APIs in a way where the APIs may be self-discovered and consumed on-line. These platforms have aggressively sought scale in an attempt to become a defacto standard and to entrench as much market share as possible.

As we move into a new era of extensive partnering the rich diversity of services which may be leveraged is hindered by the cost of partner integration. This is a barrier for innovative providers of niche services who need to tap the market reach of larger partners in order monetize their innovation and it a barrier for service providers who are trying to bundle as much value to supply to their customers.

Zero Touch Partnering is about establishing a suite of APIs and methods for working which will support partnering across a diverse range of service types and suit the needs of all service providers. Zero Touch in essence it means Zero IT development and if our industry of Communications and Digital Service Providers can adopt this approach then there are a number of possibilities which may be realised;

1. A service provider may on-board and integrate with a myriad of different service suppliers with very low effort.
2. Marketplaces will form, facilitated by Zero code interworking
3. New Innovation will find it simpler to get to market
4. The Telecommunications Carriers will collectively provide global coverage and be competitive to the big over the top platforms.

It is important to note that these APIs are not locked into supporting specific use cases. For example an intended use might be for intercarrier B2B between order management systems. The same APIs might be used by a customer portal or mobile app of the BUYER. For this reason identity and permissions becomes important in supporting broader use cases. In fact one of the most common use cases is to support a SUPPLIER portal so a BUYER who does not have the API implemented may manually order and manage products and services.

In this paper we identify the TMF APIs to use for Zero Touch Partnering. The plan for this paper is for members to progressively prove APIs in the Zero Touch Partnering use cases through a series of Catalyst Projects. These projects can then publish implementation documentation as well as requests for API enhancements to the API program.

## Scope of B2B API Usage

The idea is to not place unnecessary limits on the way Open APIs are used. We can describe intended uses for the APIs for the purpose of supporting foreseen or common use cases. Broadly we would expect the APIs to support business journeys;

- Request to Quote
- Order to Activate
- Request to Change
- Trouble to Solution
- Usage to Payment

For Services of Type Listed Below;

- Layer 1 Network Services – Predominantly fibre services including scoping, quote, appointment, installation works, civil works, consent management
- Layer 2 Network Services – Guided by the MEF Carrier Ethernet Specifications and the third network vision of the MEF.
- Layer 3 Network Services - IPVPNs
- IoA – Internet of Anything, services and products for measurement and control of anything.
- On Premise Managed Services – Firewalls, Switches, Routers, Wifi, performance measurement, DPI
- Mobile Services
- VNF Services
- Softswitch & Unified Communications
- SaaS Services
- IaaS Services
- Any other Service

Documents that identify detailed use cases targeted for support with these APIs include:

- B2B Technical Process Specification contributed by NBN Australia
- NICC ...BT UK

## Characteristics of ZTP APIs

### Discoverable

#### *Discoverable by Human*

Supporting Developer Communities has been the primary focus to date and it is only with true standardisation of the APIs that we can move beyond this stage to ZTP. Presenting meta data in some alternative lightweight developer friendly formats like JSON schema's is good for adoption amongst BUYERS who are cutting code in order to integrate.

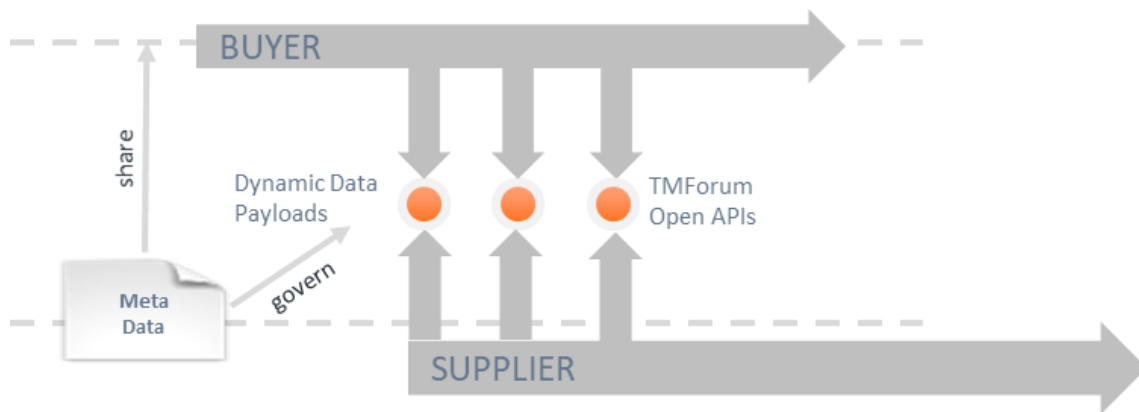
#### *Discoverable by Machine*

Machine discoverable is what ZTP is all about. On-board through catalog entry then discover products/services along with all the required characteristics for delivery and management.

### Dynamic

Once a SUPPLIER has on-boarded a buyer, it is necessary need for both buyer and supplier to be able to exchange data dynamically, which is to say without having to modify their interfaces every time a new product or business interaction changes. IT systems need a way to cope with dynamically changing interfaces without knowing in advance what those changes are. These systems need to mimic the semantic web model.

A dynamic interface will return a definition for a particular entity as well as rules on how to interpret, validate and manage that entity. For the ZTP project we apply this dynamic approach to all entities which need to be changed to support variations in products or services.



Meta Data use to govern the dynamic payloads of Open APIs can be represented in differing formats. These formats may be suited to differing use cases and some of them are not rich enough to convey full details to support ZTP. It is convenient if a SUPPLIER exposes meta-data in more than one format, for this project we are suggesting that a JSON schema hypermedia extension format is best for support of developer communities while the SID specification format is providing us with the richness required for ZTP machine to machine.

1. The use of SID specifications as Meta Data is detailed in the attached “B2B2X Service Bundling Catalyst Project Paper”. This paper was contributed to the TMForum by the project and is attached for convenience, examples are in XML.
2. The use of JSON in place of XML for SID specifications is detailed in TR254, this paper is not explicit in approach like the project findings paper. ZTP requires an explicit and mandated approach, although as discussed Meta Data does not need to be limited to a single format.

## Security

In order to achieve ZTP the industry will need to agree on a standardised method for Authentication and Authorisation. For this project we propose the use of OAuth and describe the implementation in an Appendix “ZTP OAUTH Implementation”.

We recommending OAuth be adopted for ZTP.

Security may be further enhanced using mutual certificates so that signed messages from both BUYERs and SUPPLIERs are certified as originating from the trusted partner domain. A future project might like to implement <https://tools.ietf.org/html/draft-ietf-oauth-mtls-03> for this outcome.

## Target API Suite for B2B Partner Integration

We categories the use of B2B APIs by the accepted Industry Business Use Cases

- Request to Quote
- Order to Activate
- Request to Change
- Trouble to Solution
- Usage to Payment

As these use cases describe real functions of a Service Provider, they are a good way to illustrate or group the APIs that service providers would need to expose and consume in partner integration. There are a few principles to apply;

1. The API spec should not seek to limit exposed functionality or limit support for use cases, a key principle of Open APIs is to limit by permission and otherwise allow the consumer of the API to consume in whichever way they choose so they may have maximum control over the customer journey.

## Request to Quote

API Use Case	Recommended APIs	TMF Releases	Comments
<b>Appointment</b>	<b>TMF646</b>	3 R18.0.1	<p>For appointing functional specification see OASIS Field Force Management Integration Interface (FFMII) for functional &amp; use cases.</p> <p>While the appointment API is listed as a Request to Quote API, its usage should not be limited to collecting appointments pre-order as the same API may be used to set or control appointments during order management or for tickets. The appointment API provides a standardised mechanism to book an appointment with all the necessary appointment characteristics. First, the API consists in searching free slots based on parameters, as for example a party. Then, the appointment is created. The appointment has characteristics such as nature of appointment, place of appointment. The Appointment Management API needs to be able to:</p> <ol style="list-style-type: none"> <li>1. manage available appointment capacity in the form of available slots of different types in different geographies</li> <li>2. to offer appointments of type required to support a business interaction (order, ticket etc).</li> <li>3. different available appointments to different parties based on criteria.</li> <li>4. To offer appointment for reservation prior or during ordering or ticket lifecycle.</li> <li>5. An appointment may be managed by the Service Provider BUYER, Service Provider SELLER, A Supplier to the Service Provider or the End Customer</li> </ol>
<b>Address</b>	<b>TMF673</b>	1 R17.5	

API Use Case	Recommended APIs	TMF Releases	Comments
Geo-Location	TMF675	1 R17.5	
Service Qualification	TMF645	3 R18.0.1	Service Qualification API goal is to provide service availability at Customer location.
Product Offer Qualification	TMF679	2 17.5	Qualify product on offer to party. <ul style="list-style-type: none"> <li>request a specific productOffering eligibility</li> <li>look for productOffering eligibles (ot not) from a product category</li> <li>look for productOffering eligibles (or not) from a productspec description.</li> </ul>
Product Catalog	TMF620	2 R17.5	The Product Catalog Management API allows the management of the entire lifecycle of the product catalog elements?

## Order to Activate

API Use Case	APIs	Maturity	Comments
Appointment	TMF646		Refer to Request to Quote
Inventory	TMF637	3 18.0.0	The intent of this API is to provide a consistent/standardised mechanism to query and manipulate the Product inventory. Including identifying relationships with other inventory and filtered inventory retrieval queries. This API should also be able to support use cases, where service inventory is also managed.
Catalog	TMF620		Refer to Request to Quote
Order	TMF622	4 R17.5.0	<b>Extension Order1</b> – Order specification added to (1) support configurable state lifecycle (2) allow catalog to drive tailored order experience, attributes, rules and process for different parties. (3) to support extensible order types, new, change ter, move, transfer etc. <b>KL2018 Catalyst</b> <b>Extension Order2</b> - Generalisation so that customers may order beyond products without needing to implement another order API. Product 'level' should be seen as the ordering API for a BUYER to use for all ordering. Ordering a human service, without inventory implication <b>KL2018 Catalyst</b>

API Use Case	APIs	Maturity	Comments
Service Qualification	TMF645	1 R16.0.1	Service Qualification API is one of the Pre-Ordering Management APIs. Service Qualification API goal is to provide service availability at Customer location.
Event API			There is a requirement to communicate events between SUPPLIERS and BUYERS to invoke actions on with the other party outside of the lifecycle managed Business Interactions. These APIs need to have dynamic meta data governed payloads.

## Trouble to Solution

API Use Case	Recommended APIs	Maturity	Comments
Service Performance	<ul style="list-style-type: none"> <li>TM Forum Performance Management API - TMF628</li> <li>TMForum Service Quality Management API – TMF657</li> </ul>	1 R14.5.1  1 R16.5.1	<p>TMF628 - Provides a standardised mechanism for performance management such as the creation, partial or full update and retrieval of resources involved in performance management (Measurement Production Job, Measurement Collection Job, and Ad hoc Collection). It also allows notification of events related to performance.</p> <p><b>Note that TMF628 will not provide the operational status of a service – we may need to suggest updates of the API to the TMF. (or inventory)</b></p> <p>TMF657 - Through this API, any Enterprise is able to access a Service Quality Management application and extract Service Level Specifications and associated Service Level Objectives (SLO) and their thresholds.</p>
Ticket	<ul style="list-style-type: none"> <li>TM Forum Trouble Ticket API - TMF621</li> <li>TM Forum Service Problem Management API - TMF656</li> </ul>	1 R14.5.1  1 R16.5.1	<p>TMF621 - Provides a standardised client interface to Trouble Ticket Management Systems for creating, tracking and managing trouble tickets among partners as a result of an issue or problem identified by a customer or another system.</p> <p>Examples of Trouble Ticket API clients include CRM applications, network management or fault management systems, or other trouble ticket management systems (e.g. B2B).</p> <p><b>Note: The CSDM will need to do (at least some of) the trouble ticket mapping to individual Network domains when composite services are involved.</b></p> <p>TMF656 - The SPM API is used to manage service problems. Service problems are generated based</p>



			on the information declared by a partner or the event information notified from infrastructure providers. The event information includes alarm information, performance anomaly information, trouble ticket information, SLA violation, maintenance information and prediction information.
<b>Diagnostics</b>	<ul style="list-style-type: none"> <li>TM Forum Service Test Management API - TMF653</li> <li>TM Forum Performance Management API - TMF628</li> </ul>	<p>1 R16.5.1</p> <p>1 R14.5.1</p>	<p>TMF643 - The Service Test API provides a standardised mechanism for placing a service test with all of the necessary test parameters. The API consists of a simple set of operations that interact with CRM/Service Management systems in a consistent manner. A service test is a procedure intended to check the quality, performance, or reliability of a service.</p> <p>TMF628 - Provides a standardised mechanism for performance management such as the creation, partial or full update and retrieval of resources involved in performance management (Measurement Production Job, Measurement Collection Job, and Ad hoc Collection). It also allows notification of events related to performance.</p>

## Usage to Payment

API Use Case	Recommended APIs	Maturity	Comments
	<ul style="list-style-type: none"> <li>TM Forum Usage Management API - TMF635</li> </ul>	<p>1 R14.5.1</p>	Provides standardised mechanism for usage management such as creation, update, retrieval, import and export of a collection of usages. The API manages both rated and non-rated usage. For example, it allows a service provider to 1) retrieve usage generated by a partner service platform in order to rate it and 2) to provide rated usage to a partner for consumption follow up purposes.

API Use Case	Recommended APIs	Maturity	Comments
<b>Party</b>	<b>TMF632</b>	V1	CRUD Party, Manage Users

**\*\* note the APIs of the component suite which have yet to be fully validated for ZTP are greyed**

## Extension to TMForum Assets

We have extended TMForum assets in a range of areas to achieve the ZTP (Zero Touch Partnering) outcomes in proof projects. Detailed contributions are attached as appendices. Extensions are summarised as follows;

1. A standardised approach to authentication and authorisation was required to support ZTP. We recommend the adoption of OAuth 2.0 as detailed in Appendix ZTP OAuth Implementation
2. Offering Qualification TMF679
  - a. Added a synchronous method to the API. An instant response was required to deliver a seamless outcome for automated cases.
  - b. Added a wildcard Offering Request – leave it blank to get everything
3. Product Catalog Management TMF620
  - a. Added support for Collection Characteristics as contributed in the 2014 Service Bundling in a B2B Marketplace Catalyst Project
  - b. Associated locations to product specifications – extension to TMF API Resource/data model
4. Product Order Management TMF622
  - a. Accommodate Order Specification so we can have characteristics which do not persist beyond the order lifecycle. Also supporting dynamically assigned state-lifecycle and process.
  - b. Order specifications provide structure and governance around different orders, currently the TMForum API have unmanaged string to specify types of orders. With an order specification you can have structured order types like new, change, terminate, move, transfer etc.
5. Capturing Partner Information using an “Engaged Party” Specification
  - a. Engaged Party information needs to be configurable and extensible. We have introduced the concept of a partner registry within the BUYER system where the register entities are specification instances.

## Industry Proof Projects

There have been range of Industry Projects providing learnings and contributions to this topic

Catalyst 2018 – Zero Touch Marketplace (ZTP)

Catalyst 2017 – Partnering Platform for MEF Services

Catalyst 2014 – B2B2X Service Bundling

Video is available for the 2017 Catalyst <https://vimeo.com/222332491/9d3e10bd23>

There is a proposed 2019 next stage of ZTP catalyst seeking suppliers who are prepared to supply services which support Zero Touch Partnering.

## References

[GB981 B2B2X Accelerator Introduction V0.8.2](#)

API Specifications <https://projects.tmforum.org/wiki/display/API/Open+API+Table>

## Appendix 1 – Kuala Lumpur 2018 Catalyst Project

## Appendix 2 – Meta Data Attachments

Appendix 2a - TR254\_Dynamic\_API\_Technical\_Recommendation\_R15.5.1

Appendix 2b 2014 B2B2X Service Bundling Catalyst Findings Paper  
including SID Specification Usage Guidance

Appendix 2c – Sample messages from 2017 Partnering Platform  
for MEF Services showing hypermedia JSON Schema alternative Meta Data format

## Appendix 3 – ZTP OAUTH Implementation Specification