



## *TM Forum Specification*

# Customer Bill Management API Conformance Profile

**TMF678B**

**Release 17.5.0**

**January 2018**

|                                         |                                  |
|-----------------------------------------|----------------------------------|
| <b>Release: TM Forum Release 17.5.0</b> | <b>Status: Member Evaluation</b> |
| <b>Version: 1.0.1</b>                   | <b>IPR Mode: RAND</b>            |

## NOTICE

Copyright © TM Forum 2018. All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published, and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this section are included on all such copies and derivative works. However, this document itself may not be modified in any way, including by removing the copyright notice or references to TM FORUM, except as needed for the purpose of developing any document or deliverable produced by a TM FORUM Collaboration Project Team (in which case the rules applicable to copyrights, as set forth in the [TM FORUM IPR Policy](#), must be followed) or as required to translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by TM FORUM or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and TM FORUM DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY OWNERSHIP RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Direct inquiries to the TM Forum office:

4 Century Drive, Suite 100  
Parsippany, NJ 07054, USA  
Tel No. +1 973 944 5100  
Fax No. +1 973 944 5110

TM Forum Web Page: [www.tmforum.org](http://www.tmforum.org)

## TABLE OF CONTENTS

|                                                                             |    |
|-----------------------------------------------------------------------------|----|
| NOTICE.....                                                                 | 2  |
| Table of Contents.....                                                      | 2  |
| Introduction – api descripton.....                                          | 4  |
| RESOURCE MODEL CONFORMANCE .....                                            | 5  |
| API MANDATORY AND OPTIONAL RESOURCES .....                                  | 5  |
| CUSTOMER BILL MANDATORY AND OPTIONAL ATTRIBUTES .....                       | 5  |
| AppliedCustomerBillingRate resource MANDATORY AND OPTIONAL ATTRIBUTES ..... | 10 |
| CustomerBillOnDemand resource MANDATORY AND OPTIONAL ATTRIBUTES .....       | 10 |
| NOTIFICATION MODEL CONFORMANCE .....                                        | 11 |
| API MANDATORY AND OPTIONAL NOTIFICATIONS .....                              | 11 |
| API OPERATIONS CONFORMANCE .....                                            | 12 |
| Customer Bill MANDATORY AND OPTIONAL OPERATIONS.....                        | 12 |
| API GET FILTERING OPERATION CONFORMANCE .....                               | 13 |
| Filtering in Customer Bill resource.....                                    | 13 |
| GET /customerBillManagement/customerBill .....                              | 14 |
| GET /customerBillManagement/customerBill /{ID} .....                        | 15 |
| API POST OPERATION CONFORMANCE .....                                        | 16 |
| API PATCH OPERATION CONFORMANCE .....                                       | 17 |
| API DELETE OPERATION CONFORMANCE .....                                      | 18 |
| API CONFORMANCE TEST SCENARIOS .....                                        | 19 |
| Customer resource TEST CASES.....                                           | 19 |

## INTRODUCTION – API DESCRIPTION

The following document is the Conformance Profile of the REST API for customer bill management. It includes the model definition as well as all available operations.

Products subscribed by a customer are rated at different prices depending on product offering prices and prices rules and additional terms and conditions determined by the customer. The rating process takes product usages and applies rates to them. The billing process applies additional charges (recurring charges, one time charges), discounts and taxes to products then aggregate applied rates into bills sent to customers.

The bill, ultimate goal of a billing process, can be created as a result of a cycle run (done by batch in general) or by the result of others events such as a customer request or an account termination (done in real-time).

This API allows to find and retrieve one or several customer bills (also called invoices) produced for a customer. A customer bill is an electronic or paper document produced at the end of the billing process. The customer bill gathers and displays different items (applied customer billing rates generated during the rating and billing processes) to be charged to a customer. It represents a total amount due for all the products during the billing period and all significant information like dates, bill reference... The API model support the needs for the three basic billing types : postpaid periodical bill, postpaid real-time bill and prepaid real-time bill.

This API provides also operations to find and retrieve the details of applied customer billing rates presented on a customer bill.

Finally, this API allows to request in real-time a customer bill creation and to manage this request.

## RESOURCE MODEL CONFORMANCE

### API MANDATORY AND OPTIONAL RESOURCES

| Resource Name              | Mandatory or Optional | Comments |
|----------------------------|-----------------------|----------|
| CustomerBill               | M                     |          |
| AppliedCustomerBillingRate | O                     |          |
| CustomerBillOnDemand       | O                     |          |

### CUSTOMER BILL MANDATORY AND OPTIONAL ATTRIBUTES

The table below summarizes mandatory and optional attributes for resource "CustomerBill".

| Attribute Name | Mandatory or Optional                     | Comments                                                                         |
|----------------|-------------------------------------------|----------------------------------------------------------------------------------|
| id             | M (in response messages)<br>O (otherwise) | Generated by the server and provided in the response                             |
| href           | M (in response messages)<br>O (otherwise) |                                                                                  |
| billNo         | O                                         |                                                                                  |
| category       | O                                         |                                                                                  |
| runType        | O                                         |                                                                                  |
| state          | M/O                                       | Required in response messages from the server (responses to read-GET the entity) |
| lastUpdate     | O                                         | Generated by the server                                                          |
| billDate       | M (in response messages)<br>O (otherwise) |                                                                                  |

| Attribute Name    | Mandatory or Optional                     | Comments |
|-------------------|-------------------------------------------|----------|
| nextBilldate      | O                                         |          |
| billingPeriod     | O                                         |          |
| startDateTime     | O                                         |          |
| endDateTime       | O                                         |          |
| amountDue         | M (in response messages)<br>O (otherwise) |          |
| value             | M (in response messages)<br>O (otherwise) |          |
| unit              | M (in response messages)<br>O (otherwise) |          |
| paymentDueDate    | M (in response messages)<br>O (otherwise) |          |
| remainingAmount   | O                                         |          |
| value             | O                                         |          |
| unit              | O                                         |          |
| taxExcludedAmount | O                                         |          |
| value             | O                                         |          |
| unit              | O                                         |          |
| taxIncludedAmount | O                                         |          |
| value             | O                                         |          |

| Attribute Name  |                 | Mandatory or Optional                           | Comments                  |
|-----------------|-----------------|-------------------------------------------------|---------------------------|
|                 | unit            | O                                               |                           |
| @baseType       |                 | O                                               |                           |
| @type           |                 | O                                               |                           |
| @schemaLocation |                 | O                                               |                           |
| billDocument    |                 | O                                               | Array of bill documents   |
|                 | id              | O                                               |                           |
|                 | href            | O                                               |                           |
|                 | name            | O                                               |                           |
|                 | description     | O                                               |                           |
|                 | contentType     | O                                               |                           |
|                 | sizeUnit        | O                                               |                           |
|                 | size            | O                                               |                           |
|                 | url             | O                                               |                           |
|                 | @type           | O                                               |                           |
|                 | @schemaLocation | O                                               |                           |
| appliedPayment  |                 | O                                               | Array of applied payments |
|                 | appliedAmount   | M (if appliedPayment included)<br>O (otherwise) |                           |
|                 | value           | M (if appliedPayment included)                  |                           |

| Attribute Name |                | Mandatory or Optional                                                    | Comments                                           |
|----------------|----------------|--------------------------------------------------------------------------|----------------------------------------------------|
|                |                | O (otherwise)                                                            |                                                    |
|                | unit           | M (if appliedPayment included)<br>O (otherwise)                          |                                                    |
|                | payment        | M (if appliedPayment included)<br>O (otherwise)                          |                                                    |
|                | id             | M (if appliedPayment included)<br>O (otherwise)                          |                                                    |
|                | paymentDate    | O                                                                        |                                                    |
|                | @referredType  | O                                                                        |                                                    |
|                | billingAccount | O                                                                        |                                                    |
|                | id             | M (if billingAccount included)<br>O (otherwise)                          |                                                    |
|                | href           | M (in response messages and if billingAccount included)<br>O (otherwise) | Only required in response messages from the server |
|                | name           | O                                                                        |                                                    |
|                | @referredType  | O                                                                        |                                                    |
|                | TaxItem        | O                                                                        | Array of tax items                                 |
|                | taxCategory    | O                                                                        |                                                    |



| Attribute Name |               | Mandatory or Optional                          | Comments                                           |
|----------------|---------------|------------------------------------------------|----------------------------------------------------|
|                | taxRate       | O                                              |                                                    |
|                | taxAmount     | M (if taxItem included)<br>O (otherwise)       |                                                    |
|                | value         | M (if taxItem included)<br>O (otherwise)       |                                                    |
|                | unit          | M (if taxItem included)<br>O (otherwise)       |                                                    |
| paymentMethod  |               | O                                              |                                                    |
|                | id            | M (if paymentMethod included)<br>O (otherwise) |                                                    |
|                | href          | M (if paymentMethod included)<br>O (otherwise) | Only required in response messages from the server |
|                | name          | O                                              |                                                    |
|                | @referredType | O                                              |                                                    |
| relatedParty   |               | O                                              | Array of related parties                           |
|                | id            | M (if relatedParty included)<br>O (otherwise)  |                                                    |
|                | href          | M (if relatedParty included)<br>O (otherwise)  | Only required in response messages from the server |
|                | role          | M (if relatedParty included)                   |                                                    |

| Attribute Name   |               | Mandatory or Optional                             | Comments                                           |
|------------------|---------------|---------------------------------------------------|----------------------------------------------------|
|                  |               | O (otherwise)                                     |                                                    |
|                  | name          | O                                                 |                                                    |
|                  | @referredType | O                                                 |                                                    |
| financialAccount |               | O                                                 |                                                    |
|                  | id            | M (if financialAccount included)<br>O (otherwise) |                                                    |
|                  | href          | M (if financialAccount included)<br>O (otherwise) | Only required in response messages from the server |
|                  | name          | O                                                 |                                                    |
|                  | @referredType | O                                                 |                                                    |

#### AppliedCustomerBillingRate resource MANDATORY AND OPTIONAL ATTRIBUTES

This resource is optional and not included in the basic CONNECT certification.

#### CustomerBillOnDemand resource MANDATORY AND OPTIONAL ATTRIBUTES

This resource is optional and not included in the basic CONNECT certification.

## NOTIFICATION MODEL CONFORMANCE

The Pub/Sub models are common and described in the TMF REST Design Guidelines. Use the following templates to describe the Hub Mandatory and Optional attributes and filtering support.

### API MANDATORY AND OPTIONAL NOTIFICATIONS

For the Notifications defined by the API the following table indicates which ones are mandatory and which ones are optional.

| Notification Name                   | Mandatory or Optional | Comments |
|-------------------------------------|-----------------------|----------|
| CustomerBillCreationNotification    | M                     |          |
| CustomerBillStateChangeNotification | M                     |          |

All attributes of the resource associated with the notification are mandatory

## API OPERATIONS CONFORMANCE

For every single resource use the following templates and define what operations are optional and what operations are mandatory.

### Customer Bill MANDATORY AND OPTIONAL OPERATIONS

| Uniform API Operation | Mandatory/Optional | Comments                                                    |
|-----------------------|--------------------|-------------------------------------------------------------|
| GET                   | M                  | GET must be used to retrieve a representation of a resource |
| PATCH                 | O                  | PATCH must be used to partially update a resource           |

## API GET FILTERING OPERATION CONFORMANCE

### Definitions

**Filtered Search:** A filtered search can be applied using query parameters in order to obtain only the resource entities that meet the criteria defined by the filtering parameters included in the query request. Several elements can be applied to the filtered search. In that case logic, a logical AND is applied to combine the criteria (e.g.:?customerRank=<value> &status=<value>)

**Attribute selection (Filtered Response Data):** In order to apply a filter and limit the number of attributes included in the response, the GET request can include the “?fields=” query parameter. Several elements can be applied to the filter. In that case, a logical AND is applied to combine the values (e.g.:?fields=severity,status) will provide in the response only the values assigned to attributes category and channel. Attribute selection capabilities are the same for collections retrieval and individual resource queries

All the GET operations in this API share the same status code pattern.

|                          |    |  |
|--------------------------|----|--|
| GET                      | M  |  |
| Response Status Code 200 | M  |  |
| Other Status Codes       | NA |  |

### Filtering in Customer Bill resource

| Attribute name | Filtered search<br>First Level | Filtered search<br>N Level | Attribute Selection<br>First Level | Attribute Selection<br>N Level |
|----------------|--------------------------------|----------------------------|------------------------------------|--------------------------------|
| id             | NA                             | NA                         | M                                  | NA                             |
| href           | NA                             | NA                         | M                                  | NA                             |
| runType        | O                              | NA                         | M                                  | NA                             |
| category       | O                              | NA                         | M                                  | NA                             |
| state          | M                              | NA                         | M                                  | NA                             |
| lastUpdate     | O                              | NA                         | M                                  | NA                             |
| billDate       | O                              | NA                         | M                                  | NA                             |

| Attribute name     | Filtered search<br>First Level | Filtered search<br>N Level | Attribute Selection<br>First Level | Attribute Selection<br>N Level |
|--------------------|--------------------------------|----------------------------|------------------------------------|--------------------------------|
| nextBillDate       | O                              | NA                         | M                                  | NA                             |
| billingPeriod      | NA                             | O                          | M                                  | O                              |
| amountDue          | NA                             | O                          | M                                  | O                              |
| paymentDueDate     | O                              | NA                         | M                                  | NA                             |
| remainingAmount    | NA                             | O                          | M                                  | O                              |
| taxtExcludedAmount | NA                             | O                          | M                                  | O                              |
| taxIncludedAmount  | NA                             | O                          | M                                  | O                              |
| billDocument       | NA                             | O                          | M                                  | O                              |
| paymentItem        | NA                             | O                          | M                                  | O                              |
| billingAccount     | NA                             | M                          | M                                  | O                              |
| taxItem            | NA                             | O                          | M                                  | O                              |
| paymentMethod      | NA                             | O                          | M                                  | O                              |
| relatedParty       | NA                             | M                          | M                                  | O                              |
| financialAccount   | NA                             | O                          | M                                  | O                              |

## GET /customerBillManagement/customerBill

**Filtered Search:** A filtered search can be applied using the following filtering criteria

- state: to obtain the list of customer bills that are in a given status
- billingAccount.id : to obtain the customer bills of a given billing account id
- relatedParty.id and relatedPartyRole : to obtain the customer bills of a given related party playing a given role

- other optional attributes as defined in the table above

**Filtered Data:** A filtered response can be requested for the following attributes using the “?fields=” query parameter

- Any of the attributes in the first level of Customer resource definition

```
GET /customerBillManagement/customerBill /{ID}
```

**Filtered Data:** A filtered response can be requested for the following attributes using the “?fields=” query parameter

- Any of the attributes in the first level of Customer bill resource definition

## API POST OPERATION CONFORMANCE

No POST operation available in Customer Bill API.



## API PATCH OPERATION CONFORMANCE

This section defines which attributes are patchable.

Since PATCH operation is optional and not included in the basic CONNECT certification this is not applicable in this conformance document.

## API DELETE OPERATION CONFORMANCE

No DELETE operation available in Customer Bill API.

## API CONFORMANCE TEST SCENARIOS

This section describes the test scenarios required for the basic CONNECT certification of Customer Bill Management API.

Test Cases must be executed in the order defined for each resource because the result from one of the scenarios will be input for the next one.

Requests must be addressed to the endpoint provided for certification, specifically they must be addressed to the URI defined by the concatenation of the {apiRoot} and the specific resource, where the {apiRoot} is defined as **{serverRoot}/customerBillManagement/v1**, being {serverRoot} defines the certification endpoint.

### Customer resource TEST CASES

#### Nominal Scenarios

**TC\_CustBill\_N1 – Search for customer bills with specific characteristics**

**TC\_CustBill\_N2 – Filtered retrieval of Customer bill data**

**TC\_CustBill\_N3 – Filtered Search and Filtered data response**

#### Error Scenarios

**TC\_CustBill\_E1 – Unknown Customer bill identifier**

**TC\_CustBill\_E2 – Invalid Request – Missing mandatory parameter**

**TC\_CustBill\_E3 – Invalid Request – Missing parameter mandatory in context**