



# THE API ROLE IN SYSTEM INTEGRATION

Today we find so many software and applications that can be accessed through the internet. This means that we can use them not only on our desktops but also in notebooks, mobile devices and so on, no matter the platform.

On the other side, we see companies that build solutions, but don't always think about how they can integrate it with other systems or programs that their client has. This means that all the data they gather is kept in one place and does not communicate with other solutions.

Because of those two problems, professionals started to think of a solution that could allow systems and users to talk. Called Application Program Interface (API), these new developments provide an access point between the software/system/platform and the user, whether they are a client or not.



# | What is an API?

An API is a set of routines and patterns established and documented about an application or system. Companies release this information so that other applications can use its functionality without needing to install the software.

In other words, an API is a set of information (programmable codes) that allows applications to communicate with each other more transparently. It is the interoperability - the possibility for applications and users to communicate.

For that to happen, the development of the APIs happen through two different elements:

A specification that describes how the information - or data - can be exchanged between programs.

An interface software that is written specifically for this purpose and published so the users and clients can access it.

Thus, the software that wants to access the features and capacities of an API is named “call”. The software that creates and gives access to its APIs is called “publish”.



# What does the API solve and why is it important?

It is easy to find software and applications that previously were developed to do specific things and that, today, already have APIs that allow them to have different functions. This reduces the developing time and decreases the possibilities of errors.

Besides that, the APIs also helped to enhance the quality of the software in the last decade. That happened mainly because of the growing number of cloud-based applications. This development encouraged companies to use more APIs and different systems began to communicate more, exchanging more information. All that made the user experience better not only for final-users but also for managers and decision-makers.

# TM Forum standard

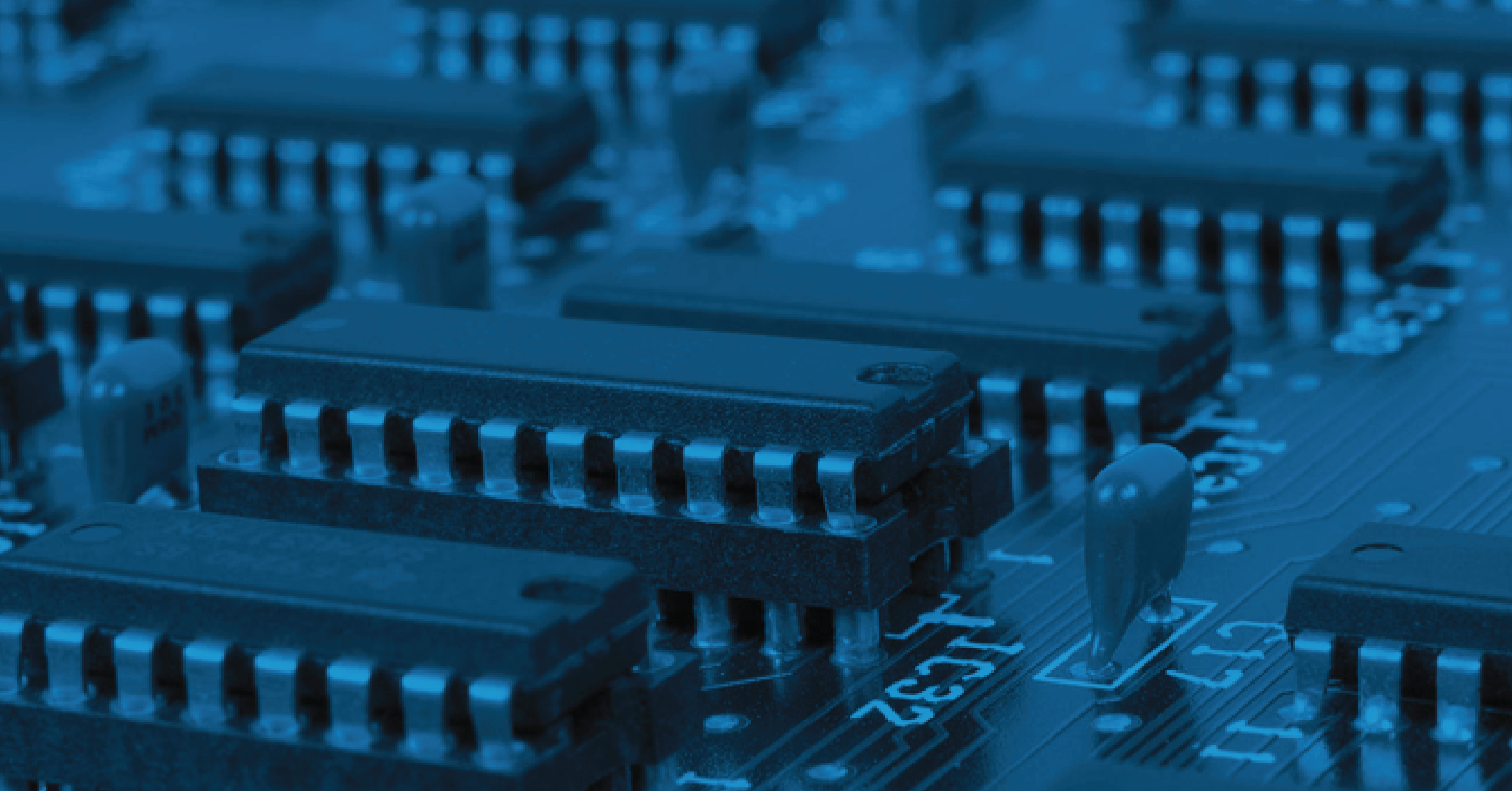
One important thing that all companies must know and follow is the TM Forum standard. It is an international guidebook of rules and best practices to organize APIs and other frameworks.

The TM Forum is a global industry association for service providers and suppliers in the telecommunications segment created in 1998 to solve system and operational management issues. Through an open and collaborative environment, the Forum has over 850 member companies.

The organizations that follow the TM Forum standards have some important benefits, such as:

- Market recognition
- Reduced cost of applications integration
- Reduced risk in transformation projects
- IT architecture simplification and agility
- And much more!





## | The REST concept

REST is an acronym for Representational State Transfer and it consists of some principles, rules, and constraints that, when followed correctly, can allow the development of a project with well-defined interfaces.

Described by Roy Fielding - one of the main creators of the HTTP protocol - in his doctoral thesis, REST is a model to be used in the architecture projection of distributed software based on network communication.

But, what does that mean? By following the rest principles, applications and software are built in a manner that makes it easier for them to communicate. And, therefore, build well-defined APIs.

So, we can say that REST is one kind of architecture and communication model that is mostly used in the development of web services. Thus, with the growth of cloud services, REST has been the main and most logical choice to create and build APIs that allow users to connect and interact with other applications and software.

# Stateless Communication: what is that?

As seen before, the main system that uses the REST model is the web. We all know that today the internet has billions of clients connected to it, exchanging information and data all the time. But, what makes it possible for the web to manage this huge amount of users and information without crashing and with such a good performance and scalability?

The answer to this question is stateless communication. This principle means that all requisitions made by a client through a REST service must contain all the necessary information for the server to understand and execute them correctly.

Therefore, any state data must be maintained by the client and not the server. The client must not depend on any information previously stored in the server to process a requisition. That is what makes it possible to enhance the REST service scalability and reduce the need for a whole amount of physical resources to store data.

# | How to use the APIs

It is known that all applications manage information and data. For example, a telecommunications application handles its users, technologies, pieces of equipment and so on. All those things are called resources in the REST model.

So, a resource can be defined as the type of information that this application manages and, following the REST model, each one must have a unique identification. This ID is used so that the application can differentiate which of the resources must be manipulated in a request.

To do that, the resource identification follows the Uniform Resource Identifier (URI) concept. This notion is one of the standards used on the web and they are the interface for using your application services. They act as a contract for your users to access your system.

But how does that work?

All the resources can be manipulated in many ways: you can create, update, delete and make many other operations with them. To do that, one of the most used models is the HTTP protocol.



When a client sends an HTTP request for a service, besides the URI, it is important that they also assign which resources he wants to change and the type of manipulation he wishes to make. All this information comes with the HTTP protocol and each one of the manipulation methods, or verbs, has its own meaning:

- **Get:** obtain data from a resource.
- **Post:** create a new resource.
- **Put:** replace data from a resource.
- **Patch:** partially update a resource.
- **Delete:** delete a resource.

**Examples:**

Let's imagine a resource named **Client** to see how the HTTP methods in a REST service can be used:

Method	URI	Use
GET	/clients	Recover all clients data
GET	/clients/id	Recover a specific client data
POST	/clients	Create a new client
PUT	/clients/id	Update a specific client data
DELETE	/clients/id	Delete a specific client

# Bwtech's External API

Knowing the importance of having a service that is not only portable but that can interoperate with other applications, Bwtech developed its own External APIs. Following TM Forum standards and the REST concept model, the feature was created to allow clients to integrate NetChart's data with other programs they use in their daily routines.

And the new feature has been a success! With clients already using it to enable NetChart's data to communicate with other programs, the feedback has been really positive. Therefore, some of the benefits Bwtech's External API can bring to a business are:

- Expansion of the knowledge gathered throughout the time.
- Increased reach of all the intelligence that is inside NetChart and its modules.
- Removal of the multivendor complexity, so the user can consume only the KPIs he needs.
- Integration with the tools used by the operators.
- Possibility of extending the types of data provided by the system (FM, core, transmission, geolocation, etc.).

But to do all that - and more -, the NetChart's External API has the goal to let users search and use the following data to communicate with other programs:

- All KPIs registered in the NetChart database.
- All objects inserted in the database by element or technology.
- All PM and CM charts that are available in the database by technology.
- All PM and CM chart columns inserted in NetChart's database.
- All KPI values that are available in the system.
- Raw PM and CM data by element or time frame.

# About Bwtech

**Bwtech** is an innovative company that has the main focus to develop tools for monitoring and optimization of mobile networks. With end-to-end solutions, it has more than 20 communication providers in 15 different countries throughout the globe. With operations in Latin America, Europe, Africa, and the Middle East, Bwtech provides services for:

- Fixed and Mobile Operator Managed Service Providers
- Telecom Regulators
- MVNE/Os

Its main product, **NetChart**, is a complete solution that addresses the challenge of dealing with the modern, huge, and complex mobile networks that generate vast and diverse volumes of data. Therefore, it provides advanced network analytics and the correlation of various network information sources, such as counters, parameters, inventory, alarms, CDRs, traces and drive tests with each other.





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