Category Selection

And

Validation Guidelines

Forward

Assuring that TL 9000 measurements data are as accurate as possible requires that organizations certified to TL 9000 select the correct product or service category. Reporting data using an incorrect category may impact the value of the performance data reports. These guidelines are to assist organizations in selecting the correct product category and assisting TL 9000 auditors in validation of the product category choice.

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https://www.tiaonline.org/what-we-do/business-performance/

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April 2022

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Purpose of These Guidelines

These guidelines are intended to help TL 9000 registered organizations, certification body (CB) auditors, and accreditation bodies (AB) assure that TL 9000 data is reported in the correct product or service category. Category selection is a responsibility of the TL 9000 registered organization, with verification of the correct choice by the CB auditor.

Responsible Parties for Proper TL 9000 Category Selection

- ➢ Organization – Responsible for category selection
- ➢ Certification Body (CB) – Responsible for validating the organization's category selection
- ➢ Accreditation Body (AB) – Responsible for verifying that the CB is effective in validation of organization's choice of category

Quick Start for Proper TL 9000 Category Selection

One of the first things an organization can do is to determine the scope of their registration, that is, define which parts of the organization will become certified. The organization provides product to customers and these products must be assigned to the correct category as part of the registration. TIA QuEST Forum has defined some 160+ product categories in a rigorous way as shown in the 'Rules for Classification of Products or Services' in the Appendix of this paper. Organizations can quickly make a first assignment of their products or services to categories by reviewing the examples for each category shown in Table A-1 of the category tables. The category tables, while part of the TL 9000 standard, are available free to the public through a link on https://tl9000.org/links.html. Next the organization refines and/or verifies the assignment through the following selection and verification steps.

Selection:
1. Consider the "scope" of the TL 9000 registration. The scope statement is something that is agreed to early in the process of certification by the organization and certification body. It describes the depth and breadth of the TL 9000 registered quality management system (QMS) and defines the products or services offered under that QMS. Customer requirements that would impact the scope or category selection must be checked.
2. Understand the primary function of the product(s) or service(s) offered to customers. Depending on the breadth of the product line or service offerings the organization may need to report data in multiple categories.
3. Compare the primary function of the product against the category definitions in Table A-1 of the category tables at https://tl9000.org/links.html.
4. Select the category(s) that best fits the primary function of the product or service delivered, while still meeting the rules for classification of products or services.

Verification:

1. Compare the data reporting requirements for each measurement relative to the business and to data availability; this will provide additional insight into proper selection. It should be that all or most of the data requirements can be fulfilled by the organization's existing processes. There may be a need to add processes to collect all of the required measurements.
2. Based on the required measurements (Table A-2) to be submitted for the selected category, determine if the selected category seems to be a reasonable fit for the organization.
3. Review the names of companies, and products, which report data into the selected category to understand what other companies report and review any similarities to help guide the category selection.
4. Review the selected categories with the organization's executive management to get their concurrence.
5. Before creating a TL 9000 registration on the TL 9000 Registration Management System, review the category selection with the chosen certification body (registrar) to get their concurrence on the category selection.
6. After entering the category into the organization's private profile in the Registration Management System, start the TIA QuEST Forum approval process described below. This process is mandatory beginning January 1, 2015.

Why Are Product Categories Important?

Table A-1 of the category tables found at https://tl9000.org/links.html defines the product categories identified by TIA QuEST Forum. The product categories allow for direct comparison of TL 9000 measurement data reported in the product categories.

There are over 1600 sites certified to TL 9000 and TL 9000 measurement data appropriate for the product categories certified at each site is submitted monthly to a secure measurements repository. TL 9000 measurements include:

➢ Problem Reports (NPR)
➢ Fix Response Time (FRT)
➢ Overdue Fix Responsiveness (OFR)
➢ Outage (SO, SONE, SSO,MTRS,GSI)
➢ On Time Delivery (OTD)
➢ Field Returns (FR,BRR)
➢ Software (SFQ, eSPR)
➢ Service Quality (SQ,CCRR,IRR)

Not all these measurements are reported in all categories. The registration option selected (H, S, and/or V) and the category determine which measurements are reported. Table A-2 identifies the measurements that can be reported by category and the registration option determines which of those measurements must be reported. For convenience, data submission templates are available that define the measurements to be reported. The templates are

publicly available through a link to Standardized Data Submission Templates on page
https://tl9000.org/links.html

The reported measurements are calculated into summary Performance Data Reports (PDRs) in a secure manner and made available to TIA QuEST Forum members (monthly) and TL 9000 registrants (annually) so that they can compare their measurements with the industry as a whole. To make sure that comparable data is used, each data submitter must report in the proper category. For example, a switch should be compared to other switches, and installation providers should be compared to other installers.

Proper category selection is most important to assure that comparable data is submitted. When data is submitted to the secure measurements repository it must be in the proper category. The reported data is placed into the category data folders and are then used to publish the PDRs, which include trend data for each measurement.

- ➢ Best in class
- ➢ Worst in class
- ➢ Industry average
- ➢ Monthly average

If data is not submitted in the correct category the integrity of the information used to generate the PDRs and annual data is reduced, thus making the data of less value to the users of the TL 9000 data.

Major Product Categories – Defined

From the category tables referenced at https://tl9000.org/links.html

Category Code	Category Name	Definition
1	Switching	Equipment for the physical or virtual interconnection of communication channels in response to a signaling system. The switching category is broadly defined to include packet or circuit switched architectures.
2	Signaling and Network Control	Equipment for the provision of signaling, i.e., states applied to operate and control the component groups of a telecommunications circuit to cause it to perform its intended function. In general, there are five basic categories of signals commonly used in the telecommunications network: supervisory signals, information signals, address signals, control signals, and alerting signals. This category includes those signaling products that function within the telecommunications network and excludes possibly similar products that normally provide enhanced services outside the network, or on the customer premises such as ACD, IVR, or voice messaging systems.
3	Transmission Systems	Equipment for the connection of the switched and interoffice networks with individual customers. An integral part of the distribution network is the loop that connects the customer to the local central office (CO), thus providing access to the interoffice network.
4	Operations & Maintenance	Equipment and systems for the management, upkeep, diagnosis and repair of the communications network.
5	Common Systems	Any of a variety of specialized shared equipment to support network elements. Common systems include power systems and the Network Equipment-Building System (NEBS) that provides space and environmental support for network elements. These systems are located in central offices and remote building locations.

Category Code	Category Name	Definition
6	Customer Premise and Enhanced Services	Equipment installed beyond the network demarcation point. Although commonly installed on the subscriber's premises, equipment with essentially identical function installed in the service provider's facility may also be classified as customer premises equipment.
7	Services	In addition to purchasing tangible hardware or software products, customers may also acquire service from an organization. Services include activities such as network engineering, installation and commissioning, product maintenance, network operation, etc., where the organization is responsible for the conduct of the activity in accordance with customer defined requirements. Services may be thought of as the result generated by activities at the interface between the organization and the customer and by the organization's internal activities to meet the customer needs. NOTES: • The interface between the customer and the organization may be represented by personnel or equipment. • Customer activities at the interface with the organization may be essential to the service delivery. • Delivery or use of tangible products may form part of the service delivery. • A service may be linked with the manufacture and supply of tangible product. • A contracted service is one where a legal agreement is reached between the customer and the organization to provide a service. Contracted services are services offered for sale to companies outside of the organization's company or its subsidiaries. • An internal service is a service activity performed for internal customers within the same company as the organization.
8	Components and Sub-assemblies	Individual components or assemblies provided for use in telecommunications systems excluding those already covered by a specific category in another category family. These items are typically used by other suppliers and not sold directly to service providers except as replacement parts.
9	End-Customer Services	End-user consumer and business customers acquire a vast variety of services from a service provider organization. These may be supplied on a buy, lease or rental basis and comprise services from simple pre-paid wireless phone service to complex solutions or outsourced facilities management of a customer organization's entire telecommunications facilities.

It is important to note some basic differences in the category tables to assist in making the proper selection. Review of the organization's scope statement should assist in focusing the selection on one of the 4 table items below.

Category(s)	Descriptions
1-6	These categories are primarily for suppliers of hardware and software products and are divided into sub categories focused on the specific function of the hardware or software product being sold to the customer. Included are products such as routers, switches, handsets and others.
7	This category is primarily for the provider of services and it is divided into sub categories focused on the specific type of service being provided. Included are services such as contract manufacturing, service center, repair and installation.
8	This category is primarily for the supply of sub-assemblies and components. It is divided into sub categories focused on the specific type of hardware/software component, sub-assembly, or tool being supplied. Included are products such as software components, optical sub-assemblies, and electronic assemblies.
9	This category is for the supplier of end-customer services. It is typically used by service providers instead of suppliers. It encompasses such offerings as voice service, wireless service, transport networks and internet access.

Which Organizations Report in A Particular Category?

When making a category selection it is often beneficial to determine which other organizations are reporting in a particular category. TIA QuEST Forum makes some TL 9000 certified registration information public:

> ➢ Company Name
> ➢ ISO 9001 Scope of Registration
> ➢ TL 9000 Scope of Registration
> ➢ Exclusions and Exemptions
> ➢ CB (registrar) Name
> ➢ Categories
> ➢ Locations

The public website, tl9000.org, provides an interface to the Registration Management System (RMS) which is the database where the registration records are stored. It is easy to search for TL 9000 certified organizations that are reporting data in a category. Start at tl9000.org then click on TL 9000 Registration from the main menu bar. Next select Certified Registrations from the left side menu and finally click on Advanced Search. Select the category from the drop-down list in the top search box then click on the button Search by Category. The RMS will return a list of organizations that are certified to TL 9000 in the selected category as shown here for category 1.2.9.1.1 "Legacy Core Routers". Clicking on the registration name provides all the publicly available information about the registration including which product categories are included.

TL ID	Registration Name	Company Name
TL 1531	CIENA Corporation	Ciena Corporation
TL 3463	Cisco Systems	Cisco Systems
TL 2207	Huawei Technologies Co., Ltd.	Huawei Technologies Co., Ltd.
TL 3428	Juniper Networks, Inc.	Juniper Networks, Inc.
TL 6109	New H3C Technologies Co., Ltd.	New H3C Technologies Co., Ltd.
TL 1193	Nokia Solutions and Networks	NOKIA
TL 3161	ZTE Corporation	ZTE Corporation

Accredited TL 9000 Certification Bodies

QuEST Forum keeps a list of the TL 9000 Certification Bodies (CB), also known as registrars and Accreditation Bodies (AB) on the TL 9000 web site at tl9000.org. There is a great deal of material on this site. Some specific topics are:

> ➢ TL 9000 Certification Bodies (CB) List
> ➢ TL 9000 Accreditation Bodies (AB) List
> ➢ CB/Auditor Resources
> ➢ Qualification Requirements for Auditors
> ➢ Code of Practice for CBs/Auditors
> ➢ Auditor Time Chart
> ➢ NACE Codes
> ➢ e-audits

These resources are all accessed by going to the TL 9000 website at tl9000.org and clicking on the ABs/CBs/Auditors button in the main menu bar.

Scope of TL 9000 Registration

Reviewing the scope of TL 9000 registration is a good place to begin the process of category selection. It outlines at a high level what products or services are covered under the TL 9000 QMS. Since it is acceptable to issue a TL 9000 registration by company, division or section, or a group of products or a particular product line, the scope statement helps provide focus for the selection of area to be certified to TL 9000.

Example Scope Statement #1 – HW & Software Systems Manufacturer
Design, Development, Manufacturing Operations and Support of Networking Solutions for the following product lines: DRS-1, x800, y800, z500, w7600, GGG 8800, GGG 8900, x0000, y0720, z2000, NMS x5310, NMS x5327, NMS x5454, NMS x5600, System Transport Manager, Solution Center (SC), Services Module (excluding other Line Cards) and including NMS Software and Port Adaptors. The Integration and Test Engineering group and the Technical Assistance Center (TAC) are included in their entirety.

Example #1 is a good example of a TL 9000 registration that is product specific. It would be likely that multiple categories would be selected for such a registration scope. Services such as "Technical Assistance Center" would likely fall into PC 7.5.1 "Technical Assistance and Customer support services". While products like "DRS-1" would likely fall into Category 1.2.9.1.1 "Legacy Core routers". Note that it is best not to enter the exact category numbers in the scope statement. Rather the category numbers are listed in a separate section of the registration profile.

Example Scope Statement #2 – Systems Networks Manufacturer
Design, development, provision and servicing of Core and Edge IP Routers, Firewall VPN devices running Systems Networks Security Operating System

The scope statement in Example #2 is much more general in nature and will require the company to collect and report measurements of all core or IP routers that they supply that are still "generally available". That conceivably could be up to four different router categories; 1.2.9.1.1 Legacy Core Routers, 1.2.9.1.2 Virtualized Core Routers, 1.2.9.2.1 Legacy Edge Routers, and 1.2.9.2.2 Virtualized Edge Routers, as well as another category for "Firewall VPN devices", which would most likely be category 6.6 "Internet Security Devices"

Example Scope Statement #3 – Installation Services
The provisioning and installation of central office equipment to specifications identified by telecommunications service providers.

The scope statement in Example #3 includes two different services. It would require the company to become certified in 7.1.1.1 Physical Installation and 7.1.2 Provisioning.

Category Tables

Appendix A (The Category Tables) listed below is part of the TL 9000 standard and is updated approximately every 12 months to add, modify or clarify the category tables. The current release of Appendix A of the Measurements Handbook may always be found on the TL 9000 website at tl9000.org under the main menu item Handbooks. Click next on Category Tables in the left side menu under Measurements Handbook. The effective dates for each release are embedded in the documents on the web site and that release is used until superseded by the next revision.

There are periods of times, usually six months, where more than one Category Table can be used. It is the choice of the data submitter to choose one of the Category Tables during those periods.

<u>List of Tables</u>
Table A-1	Category Definitions
Table A-2	Measurement Applicability Table (Normalized Units)
Table A-3	Network Element Impact Outage*
Table A-4	Transmission Standard Designations and Conversions*
Table A-5	Optical and Electrical Equivalency*
Table A-6	Measurements Summary Listing*
Table A-7	TL 9000 Data Submission Labels*

*not normally used for category selection

The "Primary Function" of the Product or Service

Category Definitions in Table A-1 of the category tables referenced at
https://tl9000.org/links.html may also include an indicator for the "primary function" of the
products or services assigned to that category. In complex product categories the primary
function is indicated in "bold" typeface within the table. That is, those complex product
categories will have an indicated primary function. Bolded text in the category definition
indicates the primary function of the category. This is the function to use for outage
measurements. Please note that many product categories are not so complex to require
amplification of "primary function". Also, use of the example column in Table A-1 will assist in
making a proper selection of category. See Table A-1 excerpt below:

Table A-1 Category Definitions			
Category Code	Category Name	Definition	Examples
1.1	Circuit Switch	Equipment used for the **termination of subscriber lines and/or trunk lines and the dynamic interconnection of these ports** or channels in a digital transmission facility. A circuit switch establishes a dedicated circuit, as opposed to a virtual circuit, in response to a signal. Stored Program Control (SPC) is the most common type of switching equipment used at end offices and tandem offices. These systems use either analog or digital switching. The switching system used must have the capability to send, receive and be actuated by signals, e.g., access line signals, or inter-office in-band or common-channel signaling. This category includes all circuit switches regardless of transmission medium, i.e., wireline or wireless.	• End-office • Tandem • Tandem access • Remote • Service switching point (SSP) • Mobile switching center (MSC)
1.2.9.1.1	Legacy Core Routers	Fully redundant routing equipment primarily intended for use in the backbone (core) of the network, connecting with edge routers and other core routers but not directly connecting with end users. Core routing equipment consisting of proprietary hardware and software.	• IP core router • Transport protocol converters • MPLS optimized packet router • Multi-service Core router • Multi-chassis router
3.2.1.2	Digital Cross Connect Systems	Equipment to provide a physical termination point for physical cables and individual conductors where changes in connections are performed electronically. These systems provide electrical cross-connection of network distribution facilities and equipment in the central office, electrical protection for conductive media, test access, temporary disconnection, and termination points for facilities and equipment. They may interface to the network either optically or metallically.	• Digital cross-connect system (DCS) • Electronic DSX
6.2.7	CPE Router	Packet routing equipment designed primarily for home or small office use to connect consumer computing, video, and IP phone equipment to the IP network. This equipment may have wireless network capability.	• 4 port router • Wireless home router • DSL/VoIP/Cable/Router (wired and/or wireless) combination box • DSL/VoIP/Satellite Router (wired and/or wireless) combination box • Intelligent Gateway

Additionally, look for an indication of the typical location of the product in the network in the
definition. For example, 1.2.9.1.1 Legacy Core routers are "in the core of the packet network
connecting other packet network elements together" while 1.2.9.2.1 Legacy Edge routers are
"at the edge of the core network", 1.2.9.3 Access routers provide an access/aggregation point
between customer premise equipment and the external network, and 6.2.7 CPE routers are
located in the "home or small office."

Multi-function Products

Sometimes a product will provide multiple functions. For such products, the following should be considered.

- ➢ If the product has a primary function, then that should be used to determine its category following both Rule 4 and Rule 5 in Section b) of the first page of Table A-1. These rules are included in Appendix A of this document.
- ➢ If multiple categories could still apply, then the reliability performance expectations for the product should be compared to those of other products in the category. This will ensure like for like comparison for the measurement data. The marketing material for the product and competitors will likely provide expectations for outage and reliability rates.

Maintenance

Category selections are required to be reviewed periodically. As noted above, the Category Tables themselves are updated on a regular basis. Categories may be split or combined, impacting your selection. Your product itself will likely change with time. It may evolve from one category into another. An example of this would be a SONET/SDH product (3.2.2.1.2.1) to which an optical switching matrix is added. This new capability would move the product to the ROADM category (3.2.2.1.2.3)

Category Approval Process

All new category selections require approval by TIA QuEST Forum before they are certified. This includes new registrations and additions to existing certifications.   The process is built into the Registration Management System. There is an option to start the process once a new category is entered into the organization's private profile. Once started the organization will be required to provide information about the product such as:

- ➢ Product or service description
- ➢ Product name and/or model number (hardware/software products – Families 1-6 and 8)
- ➢ Primary function (hardware/software products – Families 1-6 and 8)
- ➢ Competitors products name or model numbers (hardware/software products– Families 1-6 and 8)
- ➢ Link(s) to material on web
- ➢ Brochures

The approval process will be completed within 30 days.

Category Validation Program

TIA QuEST Forum has a program to actively validate an organization's category selection, should a question be raised about that selection. A team of subject matter experts whose primary concern is the accuracy of the industry data statistics will review the organization's scope statement and publicly available literature to determine the appropriateness of the category selection. If there is still an issue, a request is sent to the organization for more information. If there is a problem, the team works with the organization through the TL 9000 Administrator to determine the correct category. If a change is necessary, the TL 9000 Administrator works with the organization to move or delete prior data submissions. The organization's Certification Body will be notified of the correction.

Appendix A

Principles for Construction of the Category Tables

1) Categories shall be defined so that they can be clearly assigned within a hierarchy of classification.
2) There are well-established rules for classification.
3) Categories should not be separated artificially if they can be logically aggregated.
4) Categories should have clear definitions, which lend themselves to unambiguous interpretation.
5) For each category, the level to which measurements may be aggregated shall be defined.
6) Each category specification shall consist of standard elements.
7) The placement of the product or service in the hierarchy will reflect the dominant use of the product or service.
8) Terminology used shall reflect standard technical meanings; wherever possible aligned to relevant standards such as ITU-T, ETSI, ANSI, etc.

Rules for Classification of Products

TL 9000 Measurements Handbook – Appendix A

1) The definitions of categories in Table A-1 shall be used by organizations in categorizing their products.
2) An organization shall not classify a product or service in multiple categories. Therefore, any product or service from an organization must be classified in exactly one product or service category.
3) All new category selections must be approved by TIA QuEST Forum before the category can be added to the organization's TL 9000 Certification public profile.
4) General-purpose products, such as computers, shall be classified by specific function, e.g., signaling, when provided as a system designed for that function. Otherwise, they shall be classified in a separate category, for example, Common Systems-Computers, designed for the general-purpose product.
5) A product shall be classified according to its primary function. For example, a digital transmission facility product with performance monitoring will be classified as a transmission product instead of an operations and maintenance product.
6) The standard for classification is the product category, not the possible uses for the product. For example, if a product classification falls in the Outside Plant category, all products that are consistent with that category will be classified as such, even if the exact same product is sometimes used in the customer premises and even if a particular organization's product is sold primarily into the customer premises market.
7) Organizations choosing a category in Families 1 through 6 or Family 8 cannot exclude Clause 8.3 in the Requirements Handbook in its entirety. Organizations without responsibility for design and development should look to the service categories in Family 7 for the appropriate category.