

// Guidelines

FNT CI-Library Version 4.0 - Maintaining

Change table

Change Date	Version	Changed section	Description of the change
Februar 17	3.1	4.1	Network component Active/Passive and Manufacturer/item no:
Mai 18	4.0	4.2	Technical Data Efficiency and Battery data
Mai 18	4.0	4.3.2	Cards/slots extended by "Fuses" and "CFP"
Mai 18	4.0	4.4.2.1	Power ports nomenclature Battery ports
Mai 18	4.0	4.5.1	Slots naming nomenclature extended by fuses
Mai 18	4.0	4.10.17	Battery
Mai 18	4.0	4.12.6	Revision UPS
Mai 18	4.0	4.12.8	New Power categorie "Battery"
Mai 18	4.0	4.12.9	New Power categorie "Fuse"
Mai 18	4.0	4.12.10	New Power categorie "Power converter"
Mai 18	4.0	6.3	Revision Batteries
Mai 18	4.0	6.5.1	PDU with fuse

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1 Introduction

The guidelines for creating a standard component in accordance with FNT specifications for the Command CI Library are specified in this document.

This should make transparent for FNT GmbH customers and partners to which extent and in which form master data for devices are covered by the standard maintenance contract. As specified in the general business conditions, FNT does not accept any warranty for the completeness and the correctness of the created components.

2 Guidelines for the procurement of information required for creating a component

FNT creates device types for the CI-Library in the West European standard as realistic as possible. This requires that all technical data is available for a device type so it can be modeled completely.

Because not all information for all manufacturers is freely available even though the customer deploys the device and so normally receives the associated information, the customer is obliged to supply this information during the new request for device types.

Although the FNT Support Team supports as well as possible during the search for information, it depends on customer support.

The following details must be provided by the customer (obligatory details are marked with an *); the creation of the component in accordance with the FNT standard is not possible without their details:

- * Manufacturer
- * Type or order number
- Description
- Function
- * Dimensions (width/height/depth) with details of the measurement unit, e.g. cm
- Technical data
 - o Power consumption (kW, kVA or W)
 - o Heat emission(BTU/h, kW or W)
 - o Cooling capacity (BTU/h)
 - o Weight (empty weight) with details of the weight unit
- * Data port details
 - o Number:
All data ports of the device type must be specified, not just those relevant for the customer
 - o Designation and specification, e.g. console (RS-232), ETH-01 (RJ45):
The manufacturer designations must be specified
 - o Counting direction, e.g. from left to right, from top to bottom
 - o Any internal connection of the data ports
- * Slot details
 - o Number:
All slot data of the device type must be specified, not just those relevant for the customer
 - o Designation:
The manufacturer designations must be specified
 - o Counting direction, e.g. from left to right, from top to bottom
- * Power port details
 - o Number:
All power ports of the device type must be specified, not just those relevant for the customer
 - o Designation:
The manufacturer designations must be specified
 - o Specification:
Power consumer or power supplier
 - o Counting direction, e.g. from left to right, from top to bottom
 - o Any internal connection of the power ports
- * Assignment card - slot - chassis
 - o The chassis and the slot in which the card can be installed

The specified details are explained again in more detail in the document.

So-called user and installation guides are helpful for creating device types as components. If the customer has such documents, please make them available to FNT. In this case, the page numbers / chapter information should be specified so that the relevant information can be found. In addition, figures of the front and rear of the devices are required so that they can be represented graphically.

3 Standard/custom differentiation

FNT generally tries to create standard components so that all customers can benefit from the regular expansion of the CI Library. All standard components are available for download at <https://components.fntsoftware.com> for all customers with a valid maintenance contract.

'Custom components' are defined as being components that cannot be used generally because they were created at customer request or could not be created completely because of missing information. The created custom components are made available for download only by the associated customer (requester).

The decision whether a component is classified as standard or custom is made by FNT GmbH.

4 Master data guidelines

FNT creates master data with graphic that can be installed in the SWITCH CABINET program section. All other master data (device types without graphic, adapter, cable, cabinets (SC cabinet, power distributor and TC cabinet), assembly units, junction boxes, splice cassettes and climate devices) is created by the customer. This same is true for master data for any accessories.

The guidelines for creating a standard component are listed below.

In some areas it is not possible to make an exact specification of the configurations to be selected. In these areas (e.g. class), in Command the customer can customize the master data after it has been imported (before installation of individual devices of a type).

4.1 Basic data

All attributes of a device type are grouped in the basic data. A standard FNT component is created in accordance with the following criteria.

- Type:
 - o The unique designation (type, order number, etc.) from the manufacturer must be taken
 - o It must be unique
 - o No special characters may be used, except for – (minus) and _ (underscore)
 - o Maximum length **32** characters
 - o Notation = UPPER CASE
 - o Cannot be edited
- Description:
 - o A short English description of the device in the following form:
<manufacturer>, <device type> - <description>
 - o Maximum length **80** characters
 - o It can be edited by the customer later
- Manufacturer:
 - o Specification of the device manufacturer
 - o Selection from the selection list (data dictionary), can be extended
 - o Maximum length **20** characters
 - o No special characters are used, except for "-" (minus), "_" (underscore) and "&" (ampersand)
 - o It can no longer be changed by the application
- Function:

The function is a short description of the device and is selected in accordance with the manufacturer description / classification, e.g. Catalyst Switch = Switch function.

 - o Specification of the device function
 - o Selection from the selection list (data dictionary), can be extended
 - o Maximum length **20** characters
 - o It can be edited by the customer later
- ID-prefix:

The ID-prefix forms the Object-ID and is selected based on the type. The specified character string is used as prefix for the Object-ID.

 - o New input or selection from the selection list possible
 - o A – (dash) is always specified at the end to form the ID, e.g. PFO-
 - o Maximum length **12** characters
 - o It can be edited by the customer later
- Class:

The class controls the templates used in the Object Management and the use of the device type in the various Command modules.

 - o Selection from the selection list
 - o Can be edited only when the device is not yet being used
 - o Description of the various classes, see Device classes

- **Category:**
The category specifies the connection and internal connection possibility of the data ports and slots for the device type.
 - o Selection from the selection list
 - o Cannot be edited
 - o Description of the various categories, see Device categories

- **Power category:**
The power category specifies the connection and internal connection possibility of the power ports for the device type. Reports in the Power Management and Data Center Cockpit are also built based on these categories.
 - o Selection from the selection list
 - o Cannot be edited

Description of the various power categories, see

- Power categories

- Climate category:

The climate category specifies the connection and internal connection possibility of the climate ports for the device type. Active only for the "Climate devices" class.

- Selection from the selection list
- Cannot be edited

Description of the various climate categories, see

- Climate categories

- Splitter:

Specifies whether the device type can be placed in a splice cassette of a FIST junction box.

- Not set by FNT
- Can be used only for category = multiplexer and class = module

- Standard part:

Specifies whether the device type is a standard part and is provided for selection during placement.

- Set by FNT
- It can be edited by the customer later

- DC device:

Set by FNT when all work steps / information investigations required for a DC component have been made for a device type. There are also cases for which the investigation for the technical data produces no result or incomplete data. The "DC device" flag is still set in this case. Consequently, this flag means only that FNT had tried to obtain all information, but not whether this is complete!

- Open object data after placing:

Specifies whether the object data opens automatically after the placement.

- Not set by FNT
- Can be edited

- Placing from warehouse only:

Specifies whether the device type can be placed only from a warehouse.

- Not set by FNT
- Can be edited

- Deletion / scrapping only via warehouse:

Specifies whether the device type can be deleted only via a warehouse.

- Not set by FNT
- Can be edited

- Nomenclature object ID:

- Generated by system:
 - Used by all standalone devices
 - Cannot be edited

- Chassis/slot:

- Used by device types with flag "(Sub-)Card"
- This naming convention is always selected by FNT for device types with flag = "(Sub-)Card", blade servers are the exception, for which "Generated by system" is used
- Can be edited

- Network component Active/Passive:

- Set by FNT
- All devices and all available modules which have a power supply are marked as active (for example SFPs, PCIs)
- All devices which do not have any power supply are marked as passive
- Can be edited

- Manufacturer/item no:

- Not set by FNT
- Can be edited

- TC cabinet:

- TC ledge flag
 - Must be set for all devices offered for installation in the TC cabinet
 - Set by FNT for all symbolic ledges
- Dimensions in the X and Y directions
 - Specifies the dimensions in the TC cabinet when created with the " Use dimension" flag
 - Not set by FNT

- Side occupancy in switch cabinet:

Specifies whether the device type occupies just one or both sides when placed. The definition of the side occupancy is selected in accordance with the graphical representation of the component; see

Graphical representation of the component.

- Occupies one side:
 - Set automatically when the device type is created only with a graphic of the front side
 - Set automatically for cards and cannot be edited
 - If the device type is not used, this setting can be edited without any further check
 - If the device type is used, this setting can be edited only after performing the " Change side occupancy in switch cabinet" action
- Occupies both sides:
 - Set automatically when the device type is created with a graphic of the front and rear side
 - Can be edited when no graphic exists of the rear side but an occupancy should also be displayed graphically

4.2 Technical data

FNT maintains only known manufacturer values; the experience values remain empty and can be used by the customer for its own known values of its environment. If the manufacturer's values are not known or known only incomplete even after a comprehensive investigation, the no associated attributes or only the known attributes are maintained, respectively. FNT does not accept any responsibility for the correctness of the data.

- Power consumption (kVA):
Details of the power consumption
For the power consumption, FNT always takes the specified AC value; the associated DC value is taken only for DC devices. FNT takes the AC value for device types that have both AC and DC power ports. If the customer wants to use the DC value, he can maintain it for the device type (as experience value or manufacturer value).
- o Maintained only for standalone devices, this attribute is not maintained for cards.
 - o The following criteria give the power consumption value:
 - o Standalone device with permanently integrated power ports:
The maximum configuration value of the device is taken
 - o Standalone device with modular power supplies (cards):
 - If the device maximum configuration value is specified, this value is taken, otherwise the following rules apply:
 - Device has one power supply slot:
The value of the largest installed power supply is taken.
 - Device has two power supply slots:
1x the value of the largest installed power supply is taken, because one power supply slot is normally used for the redundant power supply
 - Device has three power supply slots:
2x the value of the largest installed power supply is taken, because one power supply slot is normally used for the redundant power supply
 - Device has four or more power supply slots:
No value is taken because no rule for the redundancy can be made
- Heat emission (BTU/h):
Details of the heat emission
For the heatemission, FNT always takes the specified AC value; the associated DC value is taken only for DC devices. FNT takes the AC value for device types that have both AC and DC power ports. If the customer wants to use the DC value, he can maintain it for the device type (as experience value or manufacturer value).
- o Maintained only for standalone devices, this attribute is not maintained for cards
- o The following criteria give the heat emission value:
 - o Standalone device with permanently integrated power ports:
The maximum configuration value of the device is taken
 - o Standalone device with modular power supplies (cards):
 - If the device maximum configuration value is specified, this value is taken, otherwise the following rules apply:
 - Device has one power supply slot:
The value of the largest installed power supply is taken.
 - Device has two power supply slots:
1x the value of the largest installed power supply is taken, because one power supply slot is normally used for the redundant power supply
 - Device has three power supply slots:
2x the value of the largest installed power supply is taken, because one power supply slot is normally used for the redundant power supply
 - Device has four or more power supply slots:
No value is taken because no rule for the redundancy can be made
- Cooling capacity (BTU/h):
Details of the cooling capacity (cooling capacity, output power)
 - o Active only for the "Climate devices" class
 - o Not maintained by FNT, see Climate components (Command Aircon module)

- Weight (kg):
 - o Details of the empty weight
 - o Maintained only for standalone devices, this attribute is not maintained for cards
- Width (cm):
 - o Details in millimeter values, i.e. 1 digit after the decimal point
 - o Maintained only for standalone devices, this attribute is not maintained for cards
 - o It is maintained only when all three values (width, height and depth) of the dimension are present
- Height (cm):
 - o Details in millimeter values, i.e. 1 digit after the decimal point
 - o Maintained only for standalone devices, this attribute is not maintained for cards
 - o It is maintained only when all three values (width, height and depth) of the dimension are present
- Depth (cm):
 - o Details in millimeter values, i.e. 1 digit after the decimal point
 - o Maintained only for standalone devices, this attribute is not maintained for cards
 - o It is maintained only when all three values (width, height and depth) of the dimension are present
- Efficiency (%):
 - o Active only for power category "PDU" and "UPS"
 - o Not maintained by FNT, the default value is 100%
- Power emission:
 - Details of the power emission
 - o Active only for power category "PDU" and "UPS".
 - o Nominal current (A)
The maximum current emission of the object in amperes (A). The object cannot emission or make available more power.
 - o Line voltage (V)
The typical line voltage (e.g. 230 V or 400 V) with which the object is operated.
 - o Nominal capacity (kVA)
This value results from the nominal current (A) and line voltage (V) details.
It is the maximum power that the device can supply. The device cannot be loaded more.
 - o Threshold (%):
The threshold as percentage. A typical threshold is 50%. This value and the nominal capacity give automatically the threshold value. FNT specifies a threshold of 100%.
 - o Threshold (A)
The maximum current output of the object in amperes (A). The object cannot output or make available more power.
The value of the nominal current (A) is entered automatically; it is not changed by FNT. This value can be edited.
 - o Threshold (kVA)
The limited power that the device can supply.
This value results from the nominal current (A), line voltage (V) and threshold (%) values.
- Battery data:
 - Details of the battery data
 - o Active only for power category "Battery"
 - o Battery type
Drop-down menu with the values Lead-acid battery, Wet-cell battery, VRLA
 - o Nominal voltage (V)
Drop-down menu with the values 12, 48, 60
 - o Number of battery strings
 - o Nominal capacity (Ah)
 - o Max. power output (kVA)
 - o Max. discharge current (A)

4.3 Graphic

4.3.1 Graphic format

Only BMP files with **256 gray levels** are created; the color depth 190 (R: 190; G: 190, B: 190) is defined as standardized background color. The BMP files are changed automatically to PNG and SWF during the master data import.

4.3.2 Size calculation for components

- Standalone devices

The size for standalone devices is calculated as follows

- o Width: 19 inch = 540 pixels / 13.5 width units
21 inch = 600 pixels / 15 width units
23 inch = 700 pixels / 17.5 width units
- o Height: 1 height unit (HU) = 40 pixels

Because the switch cabinet has a raster of 20 pixels, both the width and the height must always be divisible by 20.

- Cards/slots

The size for cards/slots is not calculated, but rather selected according to the view. Because cards can often be installed in different chassis, not only the individual requirement, but rather the complete series must be considered.

The following cards are created cross-manufacturer with standard sizes:

- o PCI: 122 * 24 pixels
- o Low-profile PCI: 60 * 20 pixels
- o GBIC: 26 * 14 pixels
- o SFP: 16 * 12 pixels
- o XFP: 16 * 12 pixels
- o XENPAK: 38 * 14 pixels
- o Network adapter card: 50 * 20 pixels (example: IBM_NA-02SFP)
- o PICMG platform: see Card size
- o Mezzanine Card (Server): 50 * 20 pixels
- o LOM / FlexibleLOM: 60 * 20 pixels (example 629135-B21)
- o Fuse: 10 * 16 pixels
- o 3-phase fuse: 30 * 16 pixels (from command version 10.4)
- o GMT-fuse: 6 * 16 pixels
- o CFP: 80* 14 pixels
- o CFP2: 26* 14 pixels
- o CFP4: 16* 12 pixels

- Deployed standard sizes

Some devices are created with standard sizes:

- o Manufacturer-independent data sockets: 80 * 80 pixels
- o Symbolic devices for the TC cabinet: 100 * 60 pixels

This value is relevant only for NFM C6000. In Command, the symbolic devices for the TC cabinet are created as device type without bitmap with the TC ledge setting (flag to the basic data).

4.3.3 Graphical representation of the component

Site occupancy in switch cabinet:

To represent active device types as realistically as possible they are created with front and rear graphic.

This means:

- All active device types are created with front and rear graphic.
- Passive device types (patch panels, multiple socket strip etc.) are created only with front graphic as before.
- For older Command versions (< Command 8.9.3) the data ports and slots should be represented in one side view. If only one view is not possible because of limited space, two types will be created (<TYPE>_FRONT / <TYPE>_REAR)

If possible, the view of the components should be realistic. Deviations can occur for the following items:

- PCI slots are created for all manufacturers with the same size.
The size for PCI slots = 122 x 24 pixels, for low-profile = 60 x 20 pixels. Correspondingly, for 3 HU (120 pixels) servers, the PCI slots that in reality are vertical are shown horizontal.
- PCI Dual:
A new variant of PCI cards, so-called Dual PCI cards exist. Because these Dual PCI cards require two PCI slots, we are forced during the creation of components to place the PCI slots directly next to / under each other without any gaps.
- LSA ledges are represented only symbolically for the TC cabinet. In this case, it suffices to create a device type without bitmap with the TC ledge setting (flag on the basic data).
- Ports are placed only horizontal and/or vertical, a rotation of 45°, for example, is not represented.
- Slots for any accessory (memory cards, hard disks, etc.) are not defined/represented as slots.
- The orientation (horizontal/vertical) of the port designation from the manufacturer is transferred. If this is not known, the orientation of the standard is selected correspondingly:
Horizontal = from left to right
Vertical = from bottom to top

4.3.4 Caption blocks

The captions for device type, port and slot designation are placed only as free text on the graphic. If the manufacturer has a specific logo and this is visible on the device, it will be used. If not or when there is insufficient space, the manufacturer is also defined as free text.

Exceptions:

Patch panels with universal port names, e.g. when the port numbering is consecutive on a type; if no free text is used for the port drawing, but rather a display string is defined for the associated A port, this can be then adapted by the customer appropriately for each placed device. These patch panels end in the type correspondingly with *_UNIV and in the description at the end (universal port name).

4.4 Port data

4.4.1 Data ports

Definition of the properties of the data ports.

- The "Side" and "Port" values are specified by FNT and cannot be edited.
- The values for connector, medium, wire type and name are specified by FNT. These settings can be adapted provided the device type is not being used. The exception is the "Name" value that can always be edited.
- The "Director port" flag is required for the Connection Matrix module when the device type should be deployed as director. It is not preassigned by FNT; a change is possible at any time when the function is changed to director.
- "Logical connections" allow an internal connection of the data ports to be defined (effect in the signal tracing). This is defined by FNT only for the appropriate manufacturer details.

4.4.1.1 Data ports nomenclature

In general, the port designations from the specifications/manuals, etc. of the manufacturer are taken. The port designations are always placed on the graphic, provided sufficient space exists on the graphic. If no port designations can be found in the specifications/manuals or on the supplied photos, the following rules apply:

- o Successive data ports are designated consecutively
Side A: A-01 to A-xx
Side B: B-01 to B-xx
- o If several different data ports exist on a component, they are also numbered consecutively in accordance with the connector type, e.g. DSUB9-01
- o Duplex ports are numbered consecutively in the name for each duplex port and the individual ports of the duplex port designated with TX or RX, e.g. one duplex port corresponds to two individual ports with the names
A-01 (TX)
A-01 (RX)

4.4.1.2 FO connector

- o If the manufacturer specifies unambiguously the special information for angled/standard polish for FO connectors, it is considered for the connector (e.g. E2000APC or E2000HLR). If the customer is prepared to ignore this special information and document the connectors "generally", the customer can adapt the connector provided the device has not yet been used. The connector may need to be stored as value in the "SDDSPC_NETWORK_CONNECTOR" data dictionary. The connector is not changed for existing device types.
- o If the ports are identified as duplex ports in the specification of the device type, they are also created by FNT as such. There is no customer-specific change into simplex ports. The individual cabling of duplex ports is possible in the Connections program section in Command. Individually cabled duplex ports are displayed currently as fully occupied in the switch cabinet.

4.4.1.3 USB connector

If the manufacturer specifies unambiguously the special information of the transmission rate and physical requirements for USB connectors, it is considered for the connector (e.g. USB 2.0 Type A or USB 3.0 Type B).

If the customer is prepared to ignore this special information and document the connectors "generally", the customer can adapt the connector provided the device has not yet been used. The connector may need to be stored as value in the "SDDSPC_NETWORK_CONNECTOR" data dictionary. The connector is not changed for existing device types.

4.4.2 Power ports

Definition of the properties of the power ports.

- The "Side" and "Port" values are specified by FNT and cannot be edited.
- The values for connector, medium, wire type, name and port category are specified by FNT. These settings can be adapted provided the device type is not being used. The exception is the "Name" value that can always be edited.
- "Logical connections" allow the internal connection of the power ports to be defined (effect in the signal tracing). This is defined by FNT only for the appropriate manufacturer details.

4.4.2.1 Power ports nomenclature

In general, the port designations from the specifications/manuals, etc. of the manufacturer are taken. The port designations are always placed on the graphic, provided sufficient space exists on the graphic. If no port designations can be found in the specifications/manuals or on the supplied photos, the following rules apply:

- o AC power ports are given the name PWR-xx (consecutively)
- o DC power ports are given the name DC-xx (consecutively)
- o For multiple socket strips, the port name A-0x is used for the power supplier ports (A side) and B-01 for the power consumer ports (B side).
- o The following rules apply to devices with power consumption and power supplier ports:
 - Port name for power consumption port = Input, for several correspondingly Input-xx (consecutively)
 - Port name for power supplier port = Output, for several correspondingly Output-xx (consecutively)
- o For battery ports the port name BAT Output-0x is used for the power supplier ports and BAT Input-0x for the power consumer ports, connector "BATTERY"

4.4.2.2 AC/DC port

Some components use a port for both alternating current (AC) and direct current (DC). For this purpose, a port with connector = "TERMINAL" is used. The AC values are taken as "technical data".

4.4.2.3 Features for three-phase power ports

Only the phase conductors (L1 – L3) are documented for three-phase power ports. The "N" and "PE" conductors are not documented.

For a three-phase power port, the selection of the port category in Command creates the corresponding number of ports, e.g. for a three-phase system, three ports are created in Command, for a two-phase system, only two ports.

4.4.2.4 Power Compact Port features

Power Compact Ports can possess both power consumption ports "L in" and power supplier ports "L out". The power consumption port "L in" and the power supplier port "L out" are each created as separate power port and then connected internally with each other. The "N" and "PE" conductors are not documented.

4.4.3 Climate port

FNT does not currently create any climate components; see Climate components (Command Aircon module). The definition of the properties of the climate ports follows.

- The "Side" and "Port" values are specified by FNT and cannot be edited.
- The values for connector, medium, wire type and name are specified by FNT. These settings can be adapted provided the device type is not being used. The exception is the "Name" value that can always be edited.

4.4.3.1 Climate ports nomenclature

The specification of the port names for climate devices is based on the climate category. The rules are described below.

Climate category, climate device:

- Input (A side) = C (cold)
For multiple ports, correspondingly 01 C; 02 C
- Output (B side) = H (hot)
For multiple ports, correspondingly 01 H; 02 H

Climate category, climate generator:

Port 1: C (cold)

Port 2: H (hot)

For multiple ports, correspondingly

Port 1: 01 C

Port 2: 01 H

Port 3: 02 C

Port 4: 02 H

4.4.4 Logical ports

FNT in the standard does not create any device types with logical ports. A project definition is possible or the definition can be created by the customer.

4.5 Slot data

Definition of the properties of the slots.

- The "Side", "Slot", "Width" and "Height" values are specified by FNT and cannot be edited.
- The value for "Slot name" specified by FNT can always be edited.
- FNT does not specify the value for "Start port numbering with" (relevant only for directors; if a director card is placed in this slot, the port names of the card ports are incremented starting at this number). It can be edited.

4.5.1 Slots naming nomenclature

In general, the slot designations from the specifications/manuals, etc. of the manufacturer are taken. The slot designations are always placed on the graphic, provided sufficient space exists on the graphic. If no slot designations can be found in the specifications/manuals or on the supplied photos, the following rules apply:

- Slots are given the name Slot 01 (consecutively) unless a special rule applies
- Slots for GBICs are given the name GBIC 01 (consecutively)
- Slots for SFPs are given the name SFP 01 (consecutively)
- Slots for XFPs are given the name XFP 01 (consecutively)
- Slots for PCI are given the name PCI 01 (consecutively)
- Slots for power supplies are given the name PWR 01 (consecutively)
- Slots for fans are given the name FAN 01 (consecutively)
- Slots for fuses are given the name Fuse 01 (consecutively)

4.6 Module/slot

Definition of cards that can be installed in slots.

- FNT creates the assignment of the cards to slots, manufacturer- and series-based
- Although this definition can be edited, if a card is installed in the associated assignment, only deactivation is possible

4.7 Port mapping

FNT does not create any port mapping as standard. The master data import creates the names specified in the port data as Default Map. A project definition is possible or the definition can be created by the customer.

4.8 Slot mapping

FNT does not create any slot mapping as standard. The master data import creates the names specified in the slot data as Default Map. A project definition is possible or the definition can be created by the customer.

4.9 Change types

FNT does not create any change types as standard.

4.10 Device classes

FNT assigns device types to device classes. These are suggested values that are selected in accordance with specific criteria. The class can be changed during the master data import or, provided the component is not yet being used, in the basic data. Note that in specific Command modules the device class controls the use of the device type. The various device classes and their specifications are described below. The specified class names already apply to Command Version 9.

4.10.1 Person

The *Person* (STCACM_PERSON) class is assigned device types of the person kind. This class is available for selection only for the case that persons from the customer are documented in rooms as for physical devices. Device types of the Person class are not provided by FNT but can be maintained by the customer because they are managed logically in the Command Standard using Accessory Management.

From Command version 10.0 on the person class is omitted.

4.10.2 Switch cabinet

The *Cabinet* (STCDEV_CABINET) class is assigned device types of the cabinet kind. They are managed as a separate "Switch cabinet" item under master data. Device types of the *Cabinet* class are not provided by FNT but must be maintained by the customer.

4.10.3 Cabinet accessories

The *Cabinet accessories* (STCDEV_CABINET_ACCESSORY) class is assigned standalone device types of the cabinet accessories kind. Examples of the *Cabinet accessories* class are shelves, placeholders, etc.

4.10.4 Chassis

The *Chassis* (STCDEV_CHASSIS) class is assigned standalone master data records of the chassis kind. This class is used for all active technology (exceptions are carriers, for which the Chassis class is also used). Its construction can be both modular (chassis + cards) and non-modular. Examples of the *Chassis* class are switches, routers, hubs, firewalls, carriers, blade center/blade enclosures (not the blades!), etc. This class is also used for active device types whose description is not unique and so cannot be assigned to any other class.

4.10.5 Chattels

The *Chattels* (STCDEV_CHATTEL) class is assigned device types of the chattels kind. Device types of the Chattels class are not provided by FNT but can be maintained by the customer. Possible examples for use of this class are: Tables, chairs.

4.10.6 Terminal

The *Terminal* (STCDEV_CLIENT) class is assigned device types of the terminal kind. This class is used for standalone device types. Its construction can be both modular (chassis + cards) and non-modular. This class is also used to control whether the device type can be used in the Client Management module. Examples of the *Terminal* are telephones, PCs, etc.

4.10.7 Climate device

The *Climate device* (STCDEV_CLIMATE) class is assigned master data records of the climate devices kind. Further description, see Climate components (Command Aircon module).

4.10.8 Data socket

The *Data socket* (STCDEV_DATA_OUTLET) class is assigned master data records of the socket kind. Exceptions are modular sockets that are assigned to the Chassis and Module classes. Examples of the *Data socket* class are sockets, data sockets, connection sockets, power sockets, etc.

4.10.9 Device

The *Device* (STCDEV_DEVICE) class is assigned master data records of the device kind. This class is used for standalone device types whose construction can be both modular (chassis + cards) and non-modular. Examples of the *Device* class are transceivers, modems, PDUs, UPSs, etc.

4.10.10 Junction box

The *Junction box* (STCDEV_JUNCTIONBOX) class is assigned all devices used as standard or FIST junction boxes in the Junction Box module. They are managed as a separate "Junction boxes" item under master data. Device types of the Junction box class are not provided by FNT but must be maintained by the customer.

4.10.11 Module

The *Module* (STCDEV_MODULE) class is assigned master data records of the (Sub-) Card kind that can be placed in slots. This class is used in active and passive areas. Examples of the *Module* class are network cards, switch modules, PCIs, SFPs, controller modules, cartridges (modular patch panel), etc.

4.10.12 NM module

The *NM module* (STCDEV_NM_MODULE) class is assigned master data records of the management module kind that can be placed in slots. Examples are supervisor modules, etc.

4.10.13 Passive module

The *Passive module* (STCDEV_PASSIVE_MODULE) class is assigned passive master data records. Exceptions are sockets that are assigned to the Data socket class and passive elements with modular construction that are assigned to the Chassis and Module classes. Examples of the *Passive module* are patch panels, jumper blocks, etc.

4.10.14 PDU

The *PDU* (STCDEV_PDU) class is not currently used by FNT for the creation; newly created components for the Power Management are assigned to other classes according to the criteria. The class can, however, be selected by the customer after the master data import, if a special grouping for components is required for the power documentation.

4.10.15 Server

The *Server* (STCDEV_SERVER) class is assigned master data records of the server kind. These are considered to be devices with an operating system that are connected to a network and on which software is made available for several users.

This class is also used to control whether the device type can be used in the Server Management module. Examples of the *Server* class are servers, workstations, blades for blade centers, etc.

Warning: Blade centers / blade enclosures (carriers for blade servers) are maintained in the *Chassis* class because they do not act as server, but only ensure the power supply and the network connectivity of the blade servers.

4.10.16 Storages

The *Storage* (STCDEV_STORAGE) class is assigned Storage master data records. The *Storage* class is used by FNT for device types that the manufacturer maintains unambiguously as storage or whose designation contains the word "storage". These types provide storage resources without any further functionality in the network. Examples of the *Storage* class are tape libraries, RAID systems / disk arrays, storage controllers, NAS devices, etc. In particular, in this environment, however, no exact assignment can be made, because the use can be interpreted differently for modern devices, e.g. NetApp Filer because of its operating system could be classified as being a server. Consequently, the class can be changed by the customer after the master data import depending on the application.

4.10.17 Battery

The *Battery* (STCDEV_BATTERY) class is assigned Battery master data records. The *Battery* class is used by FNT for device types that the manufacturer maintains unambiguously as a pure battery.

4.11 Device categories

The various device categories and their specifications are described below.

4.11.1 Terminal

The *Terminal* category is used for all device types that have only inputs but no outputs. Examples are workstations, printers, phones, faxes, etc.

The inputs can be connected logically with each other via "Logical connections". If the manufacturer specifies a unique logical connection, it is defined, otherwise no logical connections are made.

Port definitions:

Inputs (Command port side A): any number – at least 1

Outputs (port side B): none

Slots: none

Can also be used as (Sub-) Card.

4.11.2 Passive

The *Passive* category is used for all device types whose inputs and outputs are connected 1:1. Examples are junction boxes, patch panels, LSA ledges, etc.

For passive device types, internal connection is not possible since the inputs are permanently connected with the outputs.

Port definitions:

Inputs (Command port side A): any number – at least 1

Outputs (Command port side B): the same number as the inputs

Slots: none

Can also be used as (Sub-) Card.

4.11.3 Multiplexer

The *Multiplexer* category is used for all device types that have any number of inputs and are all connected to one output.

The inputs can be connected logically with each other via "Logical connections". If the manufacturer specifies a unique logical connection, it is defined, otherwise no logical connections are made.

Port definitions:

Inputs (Command port side A): any number – at least 1

Outputs (Command port side B): 1

Slots: none

Can also be used as (Sub-) Card.

4.11.4 Blackbox

The *Blackbox* category is used for all device types that have any number of inputs and outputs. The inputs and outputs can be connected internally with each other in any way via "Connections" or "Logical connections", up to multiple connections of inputs and outputs.

Port definitions:

Inputs (Command port side A): any number – at least 1

Outputs (Command port side B): any number – at least 1

Slots: none

Can also be used as (Sub-) Card.

4.11.5 Hub

The *Hub* category is used for all device types that have any number of slots and inputs. Outputs of the *Hub* category are always bus systems. By default, FNT defines device types with the *Hub* category always with one output (Command port side B).

The inputs can be connected logically with each other via "Logical connections". If the manufacturer specifies a unique logical connection, it is defined, otherwise no logical connections are made.

The slots can be equipped with device types of the (Sub-) Card definition.

Port slot definitions:

Inputs (Command port side A): any number – at least 1 or 1 slot

Outputs (Command port side B): any number of bus systems – at least 1

Slots: any number – at least 1 or 1 network port

4.11.6 Card

The *Card* category is used for device types that are placed in slots. Cards can have any number of inputs and slots or plug-in boards. The output is defined as bus system. Cards can contain other cards. The inputs can be connected logically with each other via "Logical connections". If the manufacturer specifies a unique logical connection, it is defined, otherwise no logical connections are made.

Inputs (Command port side A):	any number – at least 1 or 1 slot
Outputs (Command port side B):	1
Slots:	any number – at least 1 or 1 network port

4.11.7 Carrier

FNT no longer uses the Carrier category that has been superseded by the Hub category. Any existing device types are not adapted.

4.12 Power categories

The various power categories and their specifications are described below.

4.12.1 Device

This category contains all devices (switches, servers, routers, power supplies, etc.) with power consumer port(s). The power consumption ports are always defined on the A side.

4.12.2 PDU

This comprises the following devices:

- Devices that normally have one power consumer and several power supplier ports.
- Power base devices for redundant power supplies (usually chassis with cards) for which the chassis has one power consumer and the cards have power supplier ports.
- Devices with "n" consumption ports and "n" supply ports.

Port definitions:

- The power consumption ports and the power supplier ports are defined on the A side.
- If the feeding (consumer) is a fix port (the power cable is integrated in the device), it is defined on the B side.
- The power ports are created in the following order: First the "Input" power consumers and then the "Output" power suppliers.
- The connection between the power consumer ports and the power supplier ports must be added manually via the "Logical connection" function (effect in the signal tracing). Note: Although the power consumer ports can be connected with several power supplier ports (1:n), a multiple installation of different power consumer ports with the same power supplier ports (n:1) is not possible. FNT creates these connections only when they have been named in a specification or can be identified uniquely (e.g. two power suppliers and one power consumer).

4.12.3 RPS

These are devices that have a redundant power connection (usually DC ports). The device can be supplied either via the AC port or the RPS input port. The device then uses the RPS output ports to provide power for further devices of the same series. The first device in an RPS group is normally connected to an AC power source (e.g. multiple socket strip). The other devices are then connected with this using the RPS ports (cascaded).

- Devices that have an AC input and a DC input are created with the "device" power category.
- Devices that have an AC input, a DC input and an AC output are created with the "RPS" power category.

Port definitions:

- The power consumer ports and the power supplier ports are defined on the A side.
- The power ports are created in the following order: First the "Input" power consumers and then the "Output" power suppliers.
- The connection between the power consumer ports and the power supplier ports must be added manually via the "Logical connection" function (effect in the signal tracing). Note: Although the power consumer ports can be connected with several power supplier ports (1:n), a multiple installation of different power consumer ports with the same power supplier ports (n:1) is not possible. FNT creates these connections only when they have been named in a specification or can be identified uniquely (e.g. two power suppliers and one power consumer).

4.12.4 Stack

Stacks are considered to be all devices (switches, servers, routers, power supplies, etc.) that have power consumer port(s) and additional power supplier port(s).

Port definition:

- The power consumer ports and the power supplier ports are defined on the A side.
- The power ports are created in the following order: First the "Input" power consumers and then the "Output" power suppliers.
- The connection between the power consumer ports and the power supplier ports must be added manually via the "Logical connection" function (effect in the signal tracing). Note: Although the power consumer ports can be connected with several power supplier ports (1:n), a multiple installation of different power consumer ports with the same power supplier ports (n:1) is not possible. FNT creates these connections only when they have been named in a specification or can be identified uniquely (e.g. two power suppliers and one power consumer).

4.12.5 Power board

This comprises the usual multiple socket strips, power sockets, etc., with one power consumer port and several power supplier ports.

Port definition:

- The power supplier ports are defined on the A side; the power consumer port is defined on the B side.
- The internal connection of the power ports is made automatically.

4.12.6 UPS

This comprises UPS devices that have power consumer ports and power supplier ports.

Port definition:

- The power consumer ports and the power supplier ports are defined on the A side.
- If the feeding (consumer) is a fix port, it is defined on the B side.
- The power ports are created in the following order: First the "Input" power consumers and then the "Output" power suppliers.
- The connection between the power consumer ports and the power supplier ports must be added manually via the "Logical connection" function (effect in the signal tracing). Note: Although a power consumer port can be connected with several power supplier ports (1:n) as primary connection, a multiple installation of different power consumer ports with the same power supplier ports (n:1) must be defined as secondary connection. FNT creates these connections only when they have been named in a specification or can be identified uniquely.

4.12.7 Changeover switch

This comprises the following devices:

- Devices that normally have two power consumers and one power supplier port.
- 'Large changeover switches (normally chassis with cards)' for which the chassis has "n" power consumers and the cards each have one power supplier port.
- Devices with "n" power consumer ports and "n" power supplier ports.

Port definitions:

- The power consumer ports and the power supplier ports are defined on the A side.
- If the feeding (consumer) is a fix port (the power cable is integrated in the device), it is defined on the B side.
- The power ports are created in the following order: First the "Input" power consumers and then the "Output" power suppliers.
- The connection between the power consumer ports and the power supplier ports must be added manually via the "Logical connection" function (effect in the signal tracing). Note: Although a power consumer port can be connected with several power supplier ports (1:n) as primary connection, a multiple installation of different power consumer ports with the same power supplier ports (n:1) must be defined as secondary connection. FNT creates these connections only when they have been named in a specification or can be identified uniquely.

4.12.8 Battery

This comprises pure battery.

Port definitions:

- Devices of the "Battery" power category require exactly one power port on each side.
- The power supplier ports are defined on the A side, the power consumers on the B side.
- The internal connection of the power ports is made automatically.

4.12.9 Fuse

This comprises fuses. Fuses can be created only as card. For this purpose, the **(Sub-) card** flag must be set in the basic data.

Port definitions:

- Devices of the "Fuse" power category require at least one power category per side.
- Devices of the "Fuse" power category always have the same number of input ports and output ports (consumer ports and supplier ports).
- The power supplier ports are defined on the A side, the power consumer ports are defined on the B side.
- The power ports are created in the following order: First the "Input" power consumers and then the "Output" power suppliers.
- During the creation, each output port is linked automatically with an input port (1 to 1 relation) A-01 with B-01, A-02 with B-02, A-03 with B-03, ...
- The logical connections cannot be modified subsequently.

4.12.10 Power converter

This power category allows devices to be created whose input voltage differs from their output voltage. A transition from direct current to alternating current (or vice versa) is also possible. This allows transformers, rectifiers and inverters to be represented (**Function** attribute).

Port definitions:

- Devices of the power category "Power converter" can possess 1-n power consumer ports and 1-m power supplier ports.
- The power consumer ports and the power supplier ports are defined on the A side.
- If the feeding (consumer) is a fix port (the power cable is integrated in the device), it is defined on the B side.
- The power ports are created in the following order: First the "Input" power consumers and then the "Output" power suppliers.
- The connection between the power consumer ports and the power supplier ports must be added manually via the "Logical connection" function (effect in the signal tracing).
- An n:1 connection between the power consumer ports and the power supplier ports is possible.
- A 1:n connection between the power consumer ports and the power supplier ports is possible.

4.13 Climate categories

4.13.1 Climate device

This Climate category is used for climate devices. Climate devices accept the cooling capacity from the heat exchanger or directly from the climate generator and dissipate it at the appropriate climate zones.

Port definitions:

The same number of A-side and B-side ports.

4.13.2 Climate generator

This Climate category is used for climate generators and heat exchangers. Climate generators produce cooling capacity that is dissipated at a climate loop (cold water loop) and so to the connected climate devices. Heat exchangers (also climate generators) accept the heat load (via a coolant loop) and cool this down to a defined value and then dissipate the warmed medium again.

Port definitions:

n ports on the A-side (at least two, because always the same number for cold and hot).

5 General items

5.1 Types

In general, the unique designation (type, order number, etc.) of the manufacturer should be used as types for each device type. This is not possible for generally-valid devices (manufacturer normally UNKNOWN). For this purpose, the following nomenclature has been defined for some device types.

5.1.1 Patch panels

For patch panels with an unknown type, the type has the following form:

`<prefix>-<number of ports><connector>-<U>` e.g. PFO-06SC-1

Prefix

- PFO** prefix for **F**iber **O**ptic **P**atch panels
- P** prefix for general **P**atch panels
- PC3** prefix for **C**AT**3** **P**atch panels
- PC5** prefix for **C**AT**5** **P**atch panels
- PC6** prefix for **C**AT**6** **P**atch panels
- PC7** prefix for **C**AT**7** **P**atch panels

Number of ports: Number of ports used (two digits)

Connector: Specification of the deployed connector

U: Specification of the device height in height units

The type is used for patch panels with 19-inch width. If the patch panels have a different width, it is appended in pixels at the end of the type separated with an _ (underscore):

½ 19 inch: `<prefix>-<number of ports><connector>-<U>_<260PIXEL>`

e.g. PFO-06SC-1_260PIXEL

Other size: `<prefix>-<number of ports><connector>_<widthXheight>`

e.g. PC5-08RJ45_160X40

The type is used for patch panels with unknown manufacturer. If the manufacturer is known, it is specified in front of the type separated with an _ (underscore):

`<manufacturer>_<prefix>-<number of ports><connector>-<U>` e.g. BRUGG_PFO-24ST-1

Long manufacturer designations should be abbreviated uniquely and this abbreviation used for the type, e.g. BM_PFO-12E2000-1 → BM = Becker Mining

_UNV is appended at the end of the type for patch panels with universal portnames. The description also has the comment (universal port name) at the end.

5.1.2 Modular patch panels

For modular patch panels (hub + (Sub-) Card) with an unknown type, the type has the following form:

Hub:

`CARRIER-<number of slots>-<U>` e.g. CARRIER-02S-1

Number of slots: Number of slots used (two digits)

U: Specification of the device height in height units

The type is used for carriers with 19-inch width. If the carriers have a different width, it is appended in pixels at the end of the type separated with an _ (underscore):

½ 19 inch: `<prefix>-<number of slots>-<U>_<260PIXEL>`

Other size: `<prefix>-<number of slots>_<widthXheight>`

Card:

`<carrier type>_<number of ports><connector>` e.g. CARRIER-02S-1_12E2000_01-12

Carrier type: Type of the associated carrier

Number of ports: Number of ports used (two digits)

Connector: Specification of the deployed connector

The types are used for patch panels with unknown manufacturer. If the manufacturer is known, it is specified in front of the type separated with an _ (underscore):

`<manufacturer>_<prefix>-<number of slots>-<U>`

`<manufacturer>_<carrier type>-<number of ports><connector>`

5.1.3 Data socket

For data sockets with an unknown type, the type has the following form:

CS-<number of ports><connector> e.g. CS-1SC-SP

CS: Connection Socket

Number of ports: Number of ports used (two digits)

Connector: Specification of the deployed connector

The type is used for data sockets with unknown manufacturer. If the manufacturer is known, it is specified in front of the type separated with an _ (underscore):

<manufacturer>_<prefix>-<number of ports><connector>

5.1.4 Cards (PCI, PCI Low-Profile, GBIC, SFP, Power Supplies, Network Adapter Cards and Mezzanine Cards)

5.1.4.1 PCI

For PCIs with an unknown type, the type has the following form:

PCI-<number of ports><connector> e.g. PCI-01LC

Number of ports: Number of ports used (two digits)

Connector: Specification of the deployed connector

It is often necessary that existing Low-Profile PCI cards are also created in "normal" size (122 x 24 pixels). In this case, _FZ is appended to the type and the comment (full-size) added to the description: (full-size).

The type is used for PCIs with unknown manufacturer. If the manufacturer is known, it is specified in front of the type separated with an _ (underscore):

<manufacturer>_PCI-<number of ports><connector>

5.1.4.2 Low-profile PCI

For low-profile PCIs with an unknown type, the type has the following form:

PCI-<number of ports><connector>_LP e.g. PCI-01LC_LP

Number of ports: Number of ports used (two digits)

Connector: Specification of the deployed connector

The type is used for low-profile PCIs with unknown manufacturer. If the manufacturer is known, it is specified in front of the type separated with an _ (underscore):

<manufacturer>_PCI-<number of ports><connector>_LP

5.1.4.3 GBIC

For GBICs with an unknown type, the type has the following form:

GBIC-<number of ports><connector> e.g. GBIC-01SC

Number of ports: Number of ports used (two digits)

Connector: Specification of the deployed connector

After consultation with the customer, the core diameter can also be entered in the type for GBICs:

GBIC-<number of ports><connector>-<core diameter>

Number of ports: Number of ports used (two digits)

Connector: Specification of the deployed connector

Core diameter: Core diameter specification *SMF = single-mode fiber*
MMF = multi-mode fiber

The type is used for GBICs with unknown manufacturer. If the manufacturer is known, it is specified in front of the type separated with an _ (underscore):

<manufacturer>_GBIC-<number of ports><connector>

5.1.4.4 SFP

For SFPs with an unknown type, the type has the following form:

SFP-*<number of ports><connector>*

Number of ports: Number of ports used (two digits)

Connector: Specification of the deployed connector

After consultation with the customer, the core diameter can also be entered in the type for SFPs:

SFP-*<number of ports><connector>-<core diameter>*

Number of ports: Number of ports used (two digits)

Connector: Specification of the deployed connector

Core diameter: Core diameter specification *SMF = single-mode fiber*
MMF = multi-mode fiber

The type is used for SFPs with unknown manufacturer. If the manufacturer is known, it is specified in front of the type separated with an _ (underscore):

<manufacturer>_SFP-<number of ports><connector>**

5.1.4.5 Power supplies

For power supplies with an unknown type, the watt and AC/DC values (if known) are specified. The type has the following form:

<Chassis or series type>_PWR-AC-xxxW e.g. 69XX_PWR-AC-750W

<Chassis or series type>_PWR-DC-xxxW e.g. ERX14XX_PWR-DC-2400W

If the watt value is not known, the suffix -xxxW is omitted.

5.1.4.6 Network adapter card

For network adapter cards with unknown type, the type has the following form:

NA-*<number of ports><connector>*

Number of ports: Number of ports used (two digits)

Connector: Specification of the deployed connector

The type is used for network adapter cards with unknown manufacturer. If the manufacturer is known, it is specified in front of the type separated with an _ (underscore):

<manufacturer>_NA-<number of ports><connector>** e.g. IBM_NA-02SFP

5.1.4.7 Mezzanine card

For mezzanine cards with an unknown type, the type has the following form:

MC-*<number of ports><connector>*

Number of ports: Number of ports used (two digits)

Connector: Specification of the deployed connector

The type is used for mezzanine cards with unknown manufacturer. If the manufacturer is known, it is specified in front of the type separated with an _ (underscore):

<manufacturer>_MC-<number of ports><connector>**

5.1.5 Devices for the TC cabinet

The type for TC cabinet devices always have _SYM (*<TYPE>_SYM*), symbolic representation, at the end.

5.1.6 Data center dummy devices

For data center dummy devices with an unknown type, the type has the following form:

`<power category>-<number of ports><connector>-<U>`

- Power category: Specification of the power category used
- Number of ports: Number of ports used (two digits)
- Connector: Specification of the deployed connector
- U: Specification of the device height in height units

The type is used for data center dummy devices with 19-inch width. If they have a different width, it is appended in pixels at the end of the type separated with an `_` (underscore):

- ½ 19 inch: `<power category>-<number of ports><connector>-<U>_<260PIXEL>`
- Other size: `<power category>-<number of ports><connector>_<widthXheight>`

The type is used for data center dummy devices with unknown manufacturer. If the manufacturer is known, it is specified in front of the type separated with an `_` (underscore):

`<manufacturer>_<power category>-<number of ports><connector>-<U>`

5.1.7 Multiple socket strip

For multiple socket strips with an unknown type, the type has the following form:

`MSS-<number of ports><connector>-<U>`

- MSS **M**ultiple **s**ocket **s**trip
- Number of ports: Number of ports used (two digits)
- Connector: Specification of the deployed connector
- U: Specification of the device height in height units

The type is used for multiple socket strips with 19-inch width. If they have a different width, it is appended in pixels at the end of the type separated with an `_` (underscore):

- ½ 19 inch: `MSS-<number of ports><connector>-<U>_<260PIXEL>`
- Other size: `MSS-<number of ports><connector>_<widthXheight>`

The type is used for multiple socket strips with unknown manufacturer. If the manufacturer is known, it is specified in front of the type separated with an `_` (underscore):

`<manufacturer>_MSS-<number of ports><connector>-<U>`

5.1.8 Type of rotated components

Standalone device types (usually servers, PDUs, patch panels) are often requested in horizontal and vertical versions. The vertical version should also be differentiated between clockwise and counter-clockwise rotated versions. The form of the type for rotated components follows:

- Rotated 90 degrees counter-clockwise: `[TYPE]_90L`
- Rotated 90 degrees clockwise: `[TYPE]_90R`
- 180 degrees (mirrored horizontally): `[TYPE]_180`

5.2 Manufacturer with special characters in the company designation

Currently, special characters in manufacturer designations (data dictionary entry) cause problems for some operating systems / Webserver combinations when saving the component graphics on the server and for the URL call from the Command switch cabinet. Consequently, the special characters, except for "-" (minus), "_" (underscore), "." (point) and "&" (ampersand), are not used for creating FNT components.

5.3 Device types without graphic (bitmap)

Device types not installed in the switch cabinet whose documentation in Command does not require any graphic or because of their size an associated graphic is inappropriate are created as device type without bitmap. The device types without bitmap are not created by FNT during the support, but rather they can be created by the customer in the Administration.

5.4 Relay port

Relay ports are not currently created as standard; they are represented only graphically and do not have any function.

For previous Command / NFM C6000 versions, some relay ports have been created provisionally as data ports. As cleanup, a deletion of these ports is not possible because the device types have been used already by customers and the connections may have been cabled already. Consequently, existing data types are not changed.

6 Data center components special cases

6.1 Power port created as data port

Prior to the introduction of the Power Management, for previous Command / NFM C6000 versions, some power ports have been created provisionally as data ports. As cleanup, a deletion of these ports is not possible because the device types have been used already by customers and the connections may have been cabled already.

Consequently, FNT has defined the following procedure for the cleanup:

- The defined data port is renamed as '<port name> Mgmt.'
- The graphic entry (sprite) for this data port is removed so that the data port is no longer visible graphically (it can then only be seen in the Connection editor).
- The port is defined correctly as power port.

6.2 Data center components – Power over Ethernet

Power over Ethernet (PoE) ports are maintained as data ports because only low-voltage power supply is switched via the LAN connection and the main use of the port is the LAN connection. As workaround to determine whether too many Power over Ethernet devices are connected to a switch, the port, for example, could be marked with a border color.

6.3 Batteries

For previous Command / NFM C6000 versions, some battery ports have been created provisionally as data ports. As cleanup, a deletion of these ports is not possible because the device types have been used already by customers and the connections may have been cabled already.

Consequently, FNT has defined the following procedure for the cleanup:

- The defined data port is renamed as 'BAT-01' (numbered consecutively for multiple ports)
- The graphic entry (sprite) for this data port is removed so that the data port is no longer visible graphically (it can then only be seen in the Connection editor).

6.4 Data center components – changing previously created power supplies

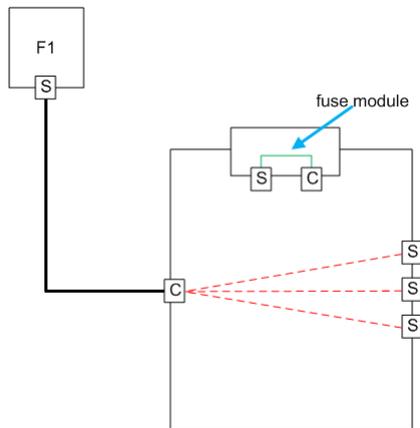
Currently, the power supplies for some device types (normally servers) are permanently defined for the device type although they are actually modular. Because of the wide distribution of these devices and the lack of compatibility, a change is not made in a modular version but rather the power ports of the power supplies are placed on the device type.

6.5 Power supply systems with integrated fuses

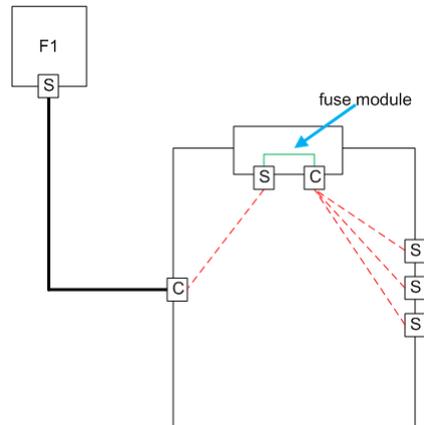
Device types with integrated fuses are mounted modular in Command. They are differentiated into various types.

6.5.1 PDU with fuse

FNT definition



Possible internal connection via the Connection Matrix

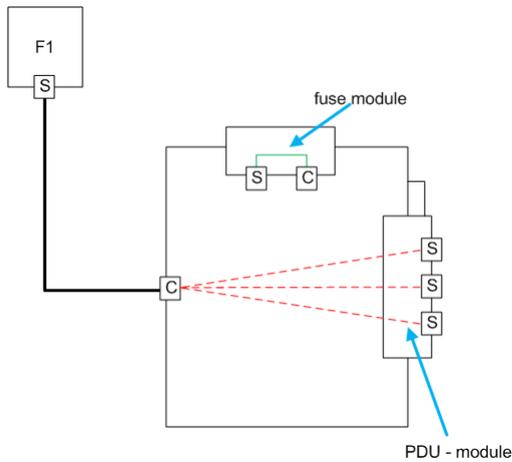


This comprises the following devices:

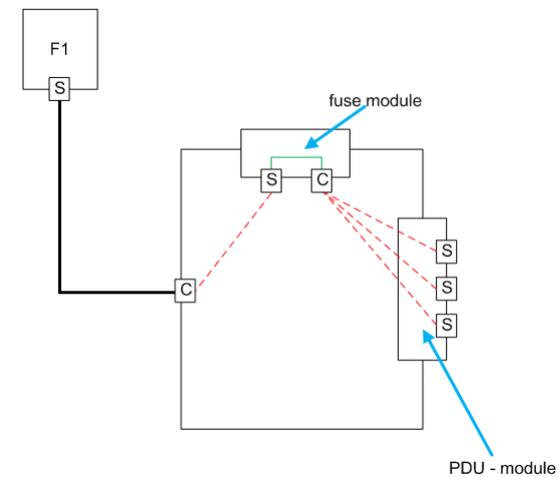
- PDUs documented with fuses or have a fuse.
- The connection from the power consumer port (input port) on the power supplier port (output port) must be added manually via the "Logical connection" function (effect in the signal tracing). FNT creates these connections only when they have been named in a specification or can be identified uniquely.
- To include the fuse in the signal tracing, the PDU must be added manually as a "Parent device" via the "Logical connection" function or via the Connection Matrix. The internal connection must be made by the customer.

6.5.2 Modular PDU

FNT definition



Possible internal connection via the Connection Matrix

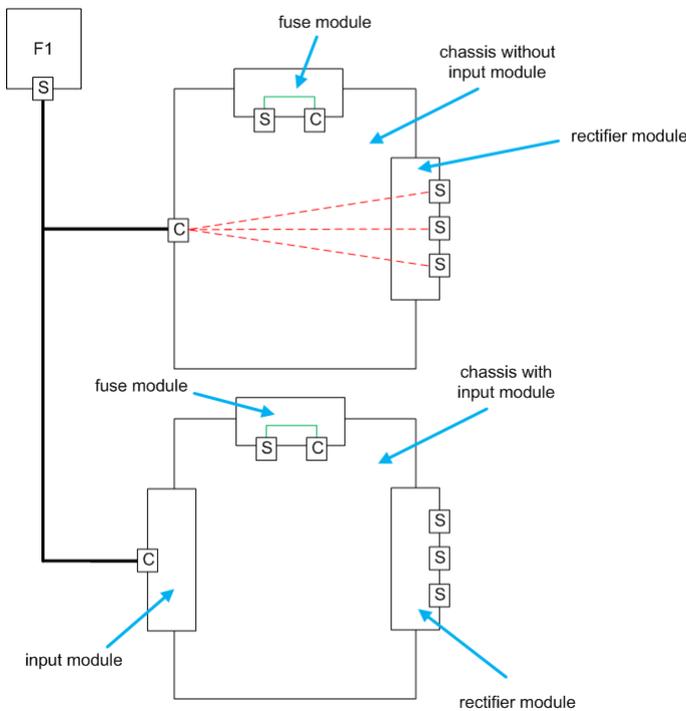


This comprises the following devices:

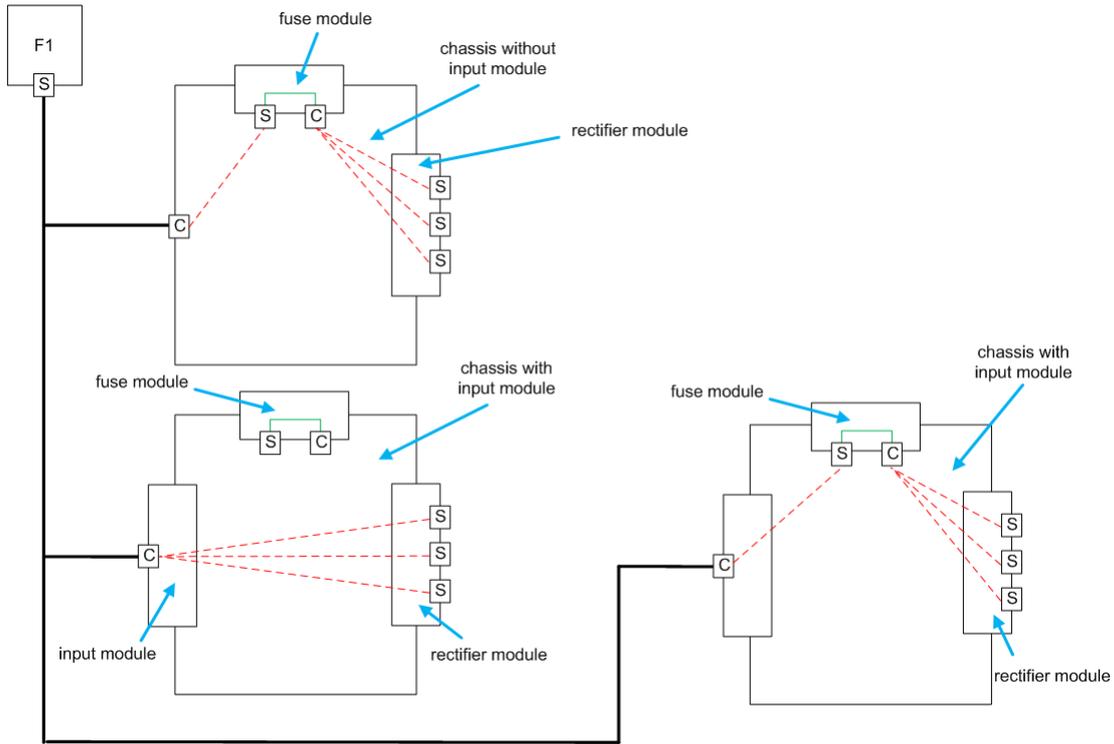
- PDUs documented with fuses or have a fuse.
- The connection from the power consumer port (input port) on the power supplier port (output port) must be added manually via the "Logical connection" function (effect in the signal tracing). FNT creates these connections only when they have been named in a specification or can be identified uniquely.
- To include the fuse in the signal tracing, the internal connection must be made by the customer via the Connection Matrix.

6.5.3 Rectifier chassis

FNT definition



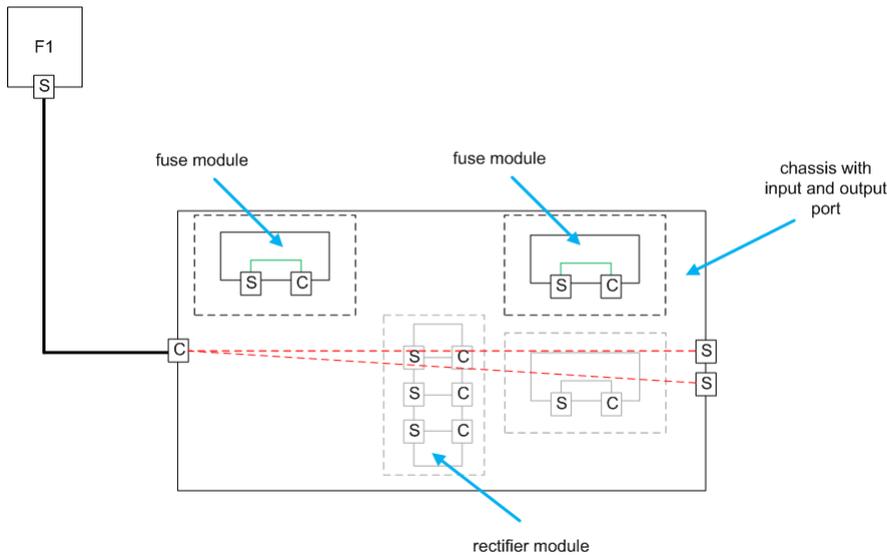
Possible internal connection via the Connection Matrix



This comprises the following devices:

- Rectifier chassis documented with fuses or have a fuse.
- The connection from the power consumer port (input port) of the chassis or of the input module on the power supplier port (output port) of the rectifier module must be added manually via the "Logical connection" function (effect in the signal tracing). FNT creates these connections only when they have been named in a specification or can be identified uniquely.
- To include the fuses in the signal tracing, the internal connection must be made by the customer via the Connection Matrix.
- For rectifier chassis that also have an input module, the customer must make the complete internal connection via the Connection Matrix because no support from module to module can be created in the Administration (see the "Possible internal connection via the Connection Matrix" rectifier chassis graphic).

6.5.4 Rectifier chassis with input fuse / pre-fuse FNT definition



This comprises the following devices:

- Rectifier chassis documented with fuses or have a fuse.
- The connection from the power consumer port (input port) on the power supplier port (output port) must be added manually via the "Logical connection" function (effect in the signal tracing). FNT creates these connections only when they have been named in a specification or can be identified uniquely.
- For this type of component, the fuses cannot be included in the signal tracing because the power ports cannot be interconnected via the Connection Matrix (a multiple connection of different power consumer ports with the same power supplier ports would result. This is currently not permitted!)

7 Climate components (Command Aircon module)

After consultation with leading manufacturers, climate devices are not normally installed in switch cabinets and consequently do not need any graphic.

Interface cards that can be installed in components and can fetch the agent data of the device for evaluations are not currently documented in Command because climate devices still focus on the evaluations for climate capacity, supply and the spatial structure in footprints rather than representing the devices graphically.

Consequently, climate devices are created as device types without graphic in accordance with the Command standard and can be created by the customer. Ports for interfaces, connections, etc. should be avoided, cards are not created.

If the customer requires a device with graphic, it can be created currently as custom component or the customer can for master data import of cabinet accessories, e.g. for trim strips, change the class to climate device and maintain the required technical data for this type. The evaluations (e.g. accumulation of the climate capacity in the technical data for switch cabinets) currently contained in Command are already provided for this case and any expansions in the switch cabinet with regard to special areas for climate devices in switch cabinets.

8 Coax components

Coax components are created in Command as device types with or without graphic depending on the function. Because net elements and remote power supply devices are also installed in cabinets, they are created with graphic. In accordance with the Command standard, coax devices and transfer points are created without graphic and so can be created by the customer.

Amplifier note: Because these modules contain control cards, they are created with the category hub (chassis). The modules in Command, however, do not influence the internal connection, they only need to be able to be documented/planned in Command. The amplifier inputs can be connected internally via "Logical connections" depending on the installed modules for placed devices.

8.1 Coax device class components

To permit the maintaining of additional information, Command provides specific device classes for coax components. Because of the downwards compatibility to older Command releases, FNT, however, does not consider the classes for the creation. The class, however, can be changed by the customer during the master data import or it can be customized by FNT because this is not possible for earlier Command 9 versions. The classes are explained in more detail below.

8.1.1 Coax device (STCDEV_COAX_DEVICE)

The following devices are classified as coax device:

Coupling: A coupling permits a passive cable connection. Such devices normally have one input and one output.

Splitter: A splitter permits a passive distribution of the signal to several following coax devices. Such devices normally have one input and several outputs.

Distributor: A distributor permits a passive distribution of the signal to several master net plans. Such devices normally have one input, one gateway and one splitter (namely, one input and two outputs).

8.1.2 Amplifier point / net element (STCDEV_COAX_NET_ELEMENT)

A coaxial amplifier is designated as net element in Command. Such a device amplifies the signal and forwards it to the following coax devices.

- Fiber node
- Amplifier point

8.1.3 Remote supply device (STCDEV_COAX_RM_POWER_SUPPLY)

Such a device establishes the power supply for net elements.

8.1.4 Transfer point (STCDEV_COAX_TRANSFER_POINT)

A building transfer point represents the last element of the trunk network before the direct customer connection. It so identifies the cable transfer of the external underground cable of the cable television network to the installation within a building.

- Building transfer point
- Termination point of the line technology (end of the coax net in the building)

8.2 Maintaining the coax data attributes

Special attributes for the coax classes can be maintained in Command. FNT does not maintain the "Starting current", " Power consumption max. assy. (W)", "Asset class" and "Amplifying" attributes because it does not normally have available any default values from the manufacturer. Such data is provided by the customer in the project.

8.3 Power ports

Power ports for coax devices are acquired and maintained in accordance with the FNT standard.

8.4 Port data - data ports

The port type (input port, junction port, signal source, gateway port) and network allocation (line network, trunk network) attributes are available for each port. FNT does not maintain these attributes because the device type can be used in different functions (in the line network and also in the trunk network).

8.5 Port data – attenuation

An attenuation can be maintained for each port and frequency. FNT does not enter any specifications because different frequencies can be used in each project. FNT does not currently have any default values from the manufacturer.

9 Accessory vs. device master data

The introduction of the Server Management / Accessory Management allows assembly parts in these modules to be defined via the assembly parts master data. Consequently, the associated object types / assembly parts are no longer created as device type; some examples follow:

- All not visible / integrated / embedded assembly parts
- Memory
- Disk drive
- Drive type
- DVD drives

Because it was not possible to define assembly parts in older Command / NFM C6000 versions, some assembly parts are created as device type and the appropriate slots also defined for these. These device types are not changed.

10 Autodiscovery mapping

FNT as standard does not create any slot mapping for Auto Discovery and Cisco Works Gateway. The master data import creates the names specified in the slot/port data as Default Map. A project definition is possible or the definition can be created by the customer.

11 Mainframe control, including data center information

11.1 Explanation

Mainframe computers or storage cabinets, subsequently also called mainframes, are normally supplied by the manufacturer as complete cabinet with the appropriate individual components and can also be specified as one component with regard to the technical data. One problem is that even when these mainframes are considered as being one component, they are still cabinets with various individual components. Such devices normally contain storage components, servers, switches, etc. that can also be replaced and installed individually. Consequently, FNT has decided to build these mainframes modularly so that customers have flexibility, such as the replacement of various assembly parts, and the device types can also be used individually. This means the usual component information for each individual component installed in a mainframe is required from the customer as described under Guidelines of the procurement for information required for creating a component.

A placement as one device type is possible from the "Assembly unit" functionality. The customer must make the appropriate definition.

11.2 Mainframe – cabinet

The size of the required switch cabinet must be determined based on the installed individual components.

11.2.1 Cabinet content / assembly parts

After the entry of the component requirements of the required assembly parts, they are created as device type in accordance with the master data guidelines and as usual made available via our component download. If required, a documentation for the overall structure of the cabinet can be created if required.

11.2.2 Mainframe technical data

The technical data is not maintained for the switch cabinet, but for the associated assembly part as described under Technical Data. The technical data is accumulated when assembly parts are placed.

12 Device type bundle

Bundles are normally supplied by the manufacturer as complete assembly unit with the appropriate individual components and can also be specified as one component with regard to the technical data. One problem is that even when these bundles are considered as being one component, they are still chassis with different cards that can be replaced. The basic chassis also has its own type. Consequently, FNT has decided to build these bundles as modules so that customers have flexibility, such as the replacement of various cards. This means for a bundle, the basic chassis is created with the associated cards and the customer can then define an appropriate assembly unit with these components.

13 SFP+ / QSFP cables

SFP+ and QSFP cables have an SFP+ / QSFP connector on both sides; these connectors are connected with a cable. A cable with permanently integrated SFP (card) cannot be represented currently in Command. Consequently, the following workaround using the manufacturer Cisco as example is used for this SFP+ / QSFP cable:

Type SFP+ Twinax cable = **SFP-H10GB-CU3M**

A "normal" SFP with the following port definitions with the type **SFP-H10GB-CU** is created:

Medium = Cu

Wire type = Twinax

Connector = SFP-10G

The associated cable types with the length values are created; for this purpose, the Cisco types can be used, **SFP-H10GB-CU1M** (for 1 m length) **SFP-H10GB-CU3M** (for 3 m length).

The properties of the SFP+ and QSFPs follow:

SFP+ Fiber Optic:

Medium = FO

Wire type = fiber

Connector = SFP-10G

SFP+ Copper:

Medium = Cu

Wire type = Twinax

Connector = SFP-10G

QSFP Fiber Optic:

Medium = FO

Wire type = fiber

Connector = QSFP-40G

QSFP Copper:

Medium = Cu

Wire type = Twinax

Connector = QSFP-40G

14 Manufacturer change

During company takeovers or for changes of the company name, it is possible that the manufacturer designations stored by FNT must be checked. A general guideline for changes of the manufacturers cannot be specified, but rather made by FNT in the specific case with the following decision principles:

- Number of components in the DB (manufacturer size)
- Number of downloads of the manufacturer
- Type of takeover: Does the manufacturer name remain in circulation?

If the decision for changing the manufacturer cannot be made by FNT alone, the change is made in cooperation between the FNT component manager and several customers who deploy the types of the affected manufacturer.

15 DIN rail system representation

DIN rail systems are only a mounting rail on which the various terminals from different manufacturers and with different sizes can be mounted. The realistic representation of the DIN rail as mounting rail with flexible "modules" is not currently possible in Command. Consequently, FNT has defined the following workaround:

The DIN rail (mounting rail) is ignored in Command and the terminals defined as "standalone device".

16 PICMG (PCI Industrial Computers Manufacturing Group) / AdvancedTCA, MicroTCA and AdvancedMC

PICMG platforms are cross-manufacturer and cross-user standards for system solutions. Accordingly, a standard size of the cards for all manufacturers is required for these platforms. They are listed below.

16.1 Description of the various platforms

- **AdvancedTCA:**
AdvancedTCA (Advanced Telecom Computing Architecture) is the first standard for very heavy data traffic and new communications services in telecommunications. AdvancedTCA was adopted in December 2002 by the PICMG (PCI Industrial Computers Manufacturing Group).
- **MicroTCA:**
MicroTCA (Micro Telecom Computing Architecture) is a modular standard for small, flexible system solutions. MicroTCA was adopted in 2006 by the PICMG.
- **AdvancedMC:**
AdvancedMC (Advanced Mezzanine Card) is an important component of the AdvancedTCA platform. The specification was adopted in 2004 by the PICMG.

16.2 Card size

16.2.1 AdvancedTCA Module

- Standard board: 32 x 320 pixels (corresponds to 6 HP / 8 HU)

16.2.2 AdvancedMC Module (AMC), Rear Transition Module (RTM), Micro Carrier Hub (MCH) Module and Power Entry Module (PEM)

- Single Compact AMC: 10 x 80 pixels (corresponds to 3 HP)
- Single Mid-Size AMC: 20 x 80 pixels (corresponds to 4 HP)
- Single Full-Size AMC: 30 x 80 pixels (corresponds to 6 HP)
- Single Compact RTM: 10 x 80 pixels (corresponds to 3 HP)
- Single Mid-Size RTM: 20 x 80 pixels (corresponds to 4 HP)
- Single Full-Size RTM: 30 x 80 pixels (corresponds to 6 HP)
- Single MCH: 30 x 80 pixels (corresponds to 6 HP)
- Single PEM: 30 x 80 pixels (corresponds to 6 HP)
- Double Compact AMC: 10 x 160 pixels (corresponds to 3 HP)
- Double Mid-Size AMC: 20 x 160 pixels (corresponds to 4 HP)
- Double Full-Size AMC: 30 x 160 pixels (corresponds to 6 HP)
- Double Compact RTM: 10 x 160 pixels (corresponds to 3 HP)
- Double Mid-Size RTM: 20 x 160 pixels (corresponds to 4 HP)
- Double Full-Size RTM: 30 x 160 pixels (corresponds to 6 HP)
- Double MCH: 30 x 160 pixels (corresponds to 6 HP)
- Double PEM: 30 x 160 pixels (corresponds to 6 HP)

17 Abbreviations

Abbreviation	Explanation
180	180 degrees (mirrored horizontally)
90L	Rotated 90 degrees counter-clockwise
90R	Rotated 90 degrees clockwise
A	Ampere
AC	Alternating Current
WU	Width Unit
BMP	Windows Bitmap
BTU	British Thermal Unit
CAT3	Category 3 - operating frequencies up to 16 MHz
CAT5	Category 5 - operating frequencies up to 100 MHz
CAT6	Category 6 - operating frequencies up to 250 MHz
CAT7	Category 7 - operating frequencies up to 600 MHz
CS	Connection Socket
DC	Direct Current
FZ	Full-size (PCI cards)
GBIC	Gigabit Interface Converter
HU	Height Unit
kVA	Kilovoltampere
kW	Kilowatt
LP	Low-Profile (PCI cards)
LSA	Solderless-, screwfree- and non-baring technology
MHz	Megahertz
MMF	Multi-mode fiber
MSS	Multiple Socket Strip
P	Patch panel
PC3	CAT3 patch panel

Abbreviation	Explanation
PC5	CAT5 patch panel
PC6	CAT6 patch panel
PC7	CAT7 patch panel
PCI	Peripheral Component Interconnect
PDU	Power Distribution Unit
PFO	Patch panel Fiber Optic
PNG	Portable Network Graphics
PoE	Power over Ethernet
QSFP	Quad small form-factor pluggable transceiver
RPS	Redundant Power System
DC	Data Center
SFP	Small form-factor pluggable transceiver
SFP+	10 Gigabit small form-factor pluggable plus transceiver
SMF	Single-mode fiber
SWF	Shockwave Flash
U	Rack Unit
UPS	Uninterruptible Power Supply
V	Volt
W	Watt
XENPAK	10 Gigabit fiber optic transceiver
XFP	10 Gigabit small form-factor pluggable transceiver

Table 17-1 List of abbreviations

Note: Abbreviations are not listed alphabetically.