

# Asset inventory at CNAF and Tecnopolo

Andrea Chierici

**Giusy Sergi**

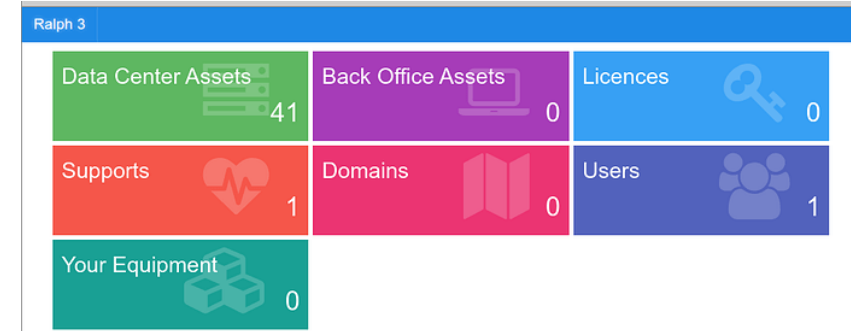
# Requirements

---

- Track expanding data center inventory
- Regulatory compliance
- Leave the old asset management tool
  - Internally developed, no recent updates
  - Not easy to maintain and to add assets
- Ldap authentication

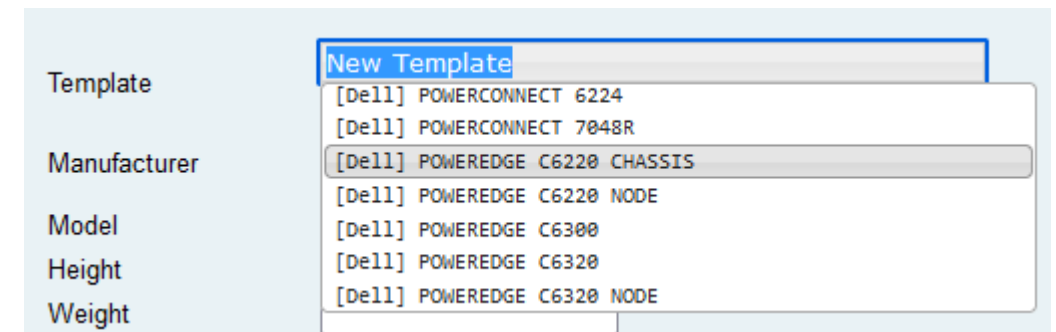
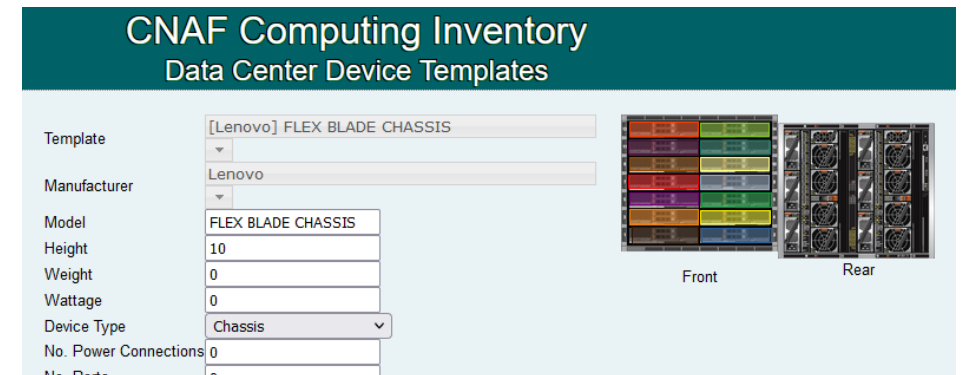
# Products evaluated

- Insight
- Ralph
- **OpenDCIM**
  - Free web-based application
  - Lightweight
  - Data center oriented
- All solutions have pros and cons



# Features

- DC/Rack/Rows visibility and placement in space
  - Flexible blade and twin management
- Templates
- Supports multiple data centers
- Network connections
- Customizable asset information
- Bulk import (via csv)

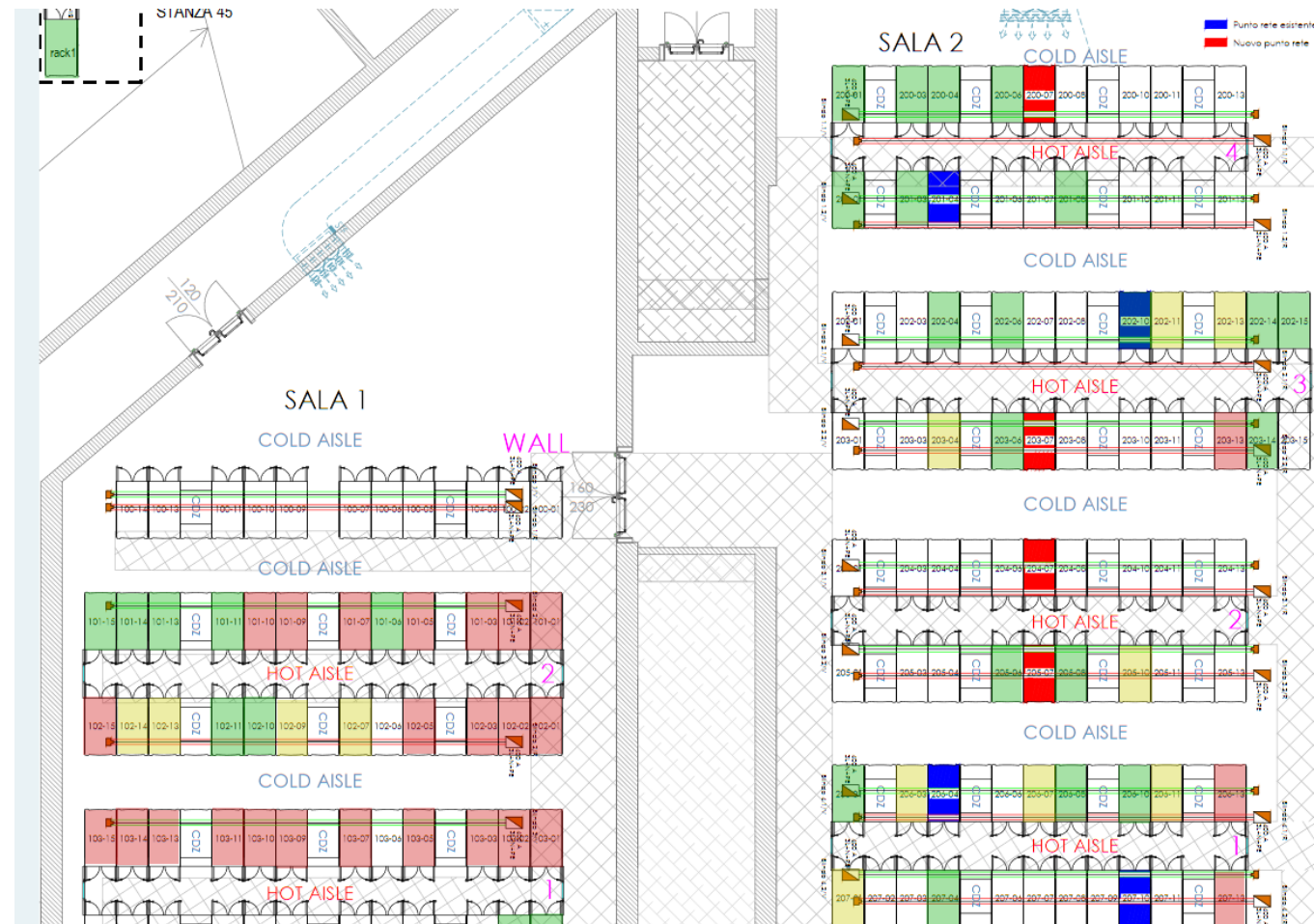


# Our instance: [inventory.cnaf.infn.it](https://inventory.cnaf.infn.it)

---

- Initial evaluation to accomplish with ISO requirements
  - Positive outcome
- Adopted for **Tecnopolo** and **current T1** data centers
  - Only recent assets have been inserted
  - LDAP authentication with users provided through freeIPA

# Data center view



# Row view

INFN CNAF Computing Infrastructure Data Center Cabinet Inventory

Search by Name:

[ Advanced ] [ Custom Search ]

Reports

- Rack Request Form
- User Administration >
- Issue Escalation >
- Project Catalog
- Template Management >
- Infrastructure Management >
- Bulk Importer >
- Materiel Management >
- Power Management >
- Path Connections >
- Edit Configuration
- Logout

Home

- INFN CNAF
- CNAF-DC
  - Centrostella Rete
  - Library zone
  - Offices
  - Sala 1
  - Sala 2
    - 200
    - 201
    - 202
    - 203
    - 205
    - 206
    - 207
  - Stanza 45
    - Storage Room
  - Tecnopolo
  - INFN-Test
    - General Storage Room

API Documentation

Swagger

Rear View Add new cabinet

Images Labels Position

Pos	Device
42	
41	(I) SW-206-13-02
40	(I) SW-206-13-02
39	
38	SW-206-13-01
37	NOVA-206-13-36/37
36	
35	NOVA-206-13-34/35
34	
33	CLOUD-NET01
32	CLOUD-NET02
31	HV03
30	
29	SDDS-OVIRT11
28	NOVA-R1-206-13-27/28
27	
26	NOVA-R1-206-13-25/26
25	
24	NODOMONITORAGGIO
23	HV01
22	HV02
21	HV04
20	
19	STOR00
18	
17	
16	STOR01
15	
14	


Pos	Device
42	
41	
40	STOR05
39	
38	
37	
36	STOR04
35	
34	
33	GPFS-206-11-32/33
32	
31	
30	
29	
28	
27	
26	
25	
24	SW-206-11-01
23	
22	
21	
20	SW-206-11-02
19	
18	POWERSVAULT
17	
16	
15	
14	

Pos	Device
42	(I) SW-206-10-02
41	
40	
39	
38	
37	NOVA-206-10-36/37
36	
35	CLOUD-TESTBED-206-10-34/35
34	
33	NOVA-206-10-32/33
32	
31	NOVA-206-10-30/31
30	
29	NOVA-206-10-28/29
28	
27	NOVA-206-10-26/27
26	
25	
24	
23	(I) SW-206-10-01
22	
21	NOVA-206-10-20/21
20	
19	NOVA-206-10-18/19
18	
17	NOVA-206-10-16/17
16	
15	NOVA-206-10-14/15
14	

Pos	Device
42	
41	(I) SW-206-08
40	
39	
38	
37	
36	
35	
34	
33	
32	
31	
30	NOVA-206-08
29	
28	NOVA-206-08
27	
26	NOVA-206-08
25	
24	NOVA-206-08
23	
22	NOVA-206-08
21	
20	
19	
18	(I) SW-206-08
17	
16	
15	
14	



# Rack view



## CNAF Computing Inventory Data Center Cabinet Inventory

Search by Name:

[ Advanced ] [ Custom Search ]

- Reports
- Rack Request Form
- User Administration
- Issue Escalation
- Project Catalog
- Template Management
- Infrastructure Management
- Bulk Importer
- Materiel Management
- Power Management
- Path Connections
- Edit Configuration
- Logout

Home

- INFN CNAF
  - CNAF-DC
    - Centrostella Rete
    - Library zone
    - Offices
    - Sala 1
    - Sala 2
      - 200
      - 201
      - 202
      - 203
      - 205
      - 206
        - 206-01
        - 206-03
        - 206-07

Images Labels Position

206-13		206-13 (Rear)	
Pos	Device	Pos	Device
42		42	
41	(T)SW-206-13-02	41	(T)SW-206-13-02
40	(T)SW-206-13-02	40	(T)SW-206-13-02
39		39	
38	SW-206-13-01	38	SW-206-13-01(Rear)
37	NOVA-206-13-36/37	37	HV06 (Rear) HV08 (Rear)
36		36	HV05 (Rear) HV07 (Rear)
35	NOVA-206-13-34/35	35	NOVA-206-13-34/35(Rear)
34		34	
33	CLOUD-NET01	33	CLOUD-NET01(Rear)
32	CLOUD-NET02	32	CLOUD-NET02(Rear)
31	HV03	31	HV03(Rear)
30		30	
29	SDDS-OVIRT11	29	SDDS-OVIRT11(Rear)
28	NOVA-R1-206-13-27/28	28	NOVA-R1-206-13-27/28(Rear)
27		27	
26	NOVA-R1-206-13-25/26	26	NOVA-R1-206-13-25/26(Rear)
25		25	
24	NODOMONITORAGGIO	24	NODOMONITORAGGIO(Rear)
23	HV01	23	HV01(Rear)
22	HV02	22	HV02(Rear)
21	HV04	21	HV04(Rear)
20		20	
19	STOR00	19	STOR00(Rear)
18		18	
17		17	

Markup Key

- Production
- SDDS
- (T) - Template Unassigned

Zero-U Devices

HV03

Power Distribution

Add CDU

Last Audit: Never

Model:

Data Center: CNAF-DC

Install Date: 2021-06-11

Zone: Sala 2

Row: 206

Tags:

Certify Audit

Add Device

Audit Report

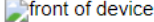
Map Coordinates


Edit Cabinet

Delete Cabinet



# Device Informations

<b>Asset Tracking</b> Device ID Status: <span>Reserved</span> Label Serial Number Asset Tag Primary IP / Host Name Manufacture Date Install Date: 2022-05-17 Warranty Company Warranty Expiration: 1970-01-01 Last Audit Completed Departmental Owner: <span>Farming</span> <span>Show Contacts</span> <b>Escalation Information</b> Time Period: <span>Select...</span> Details: <span>Select...</span> Primary Contact: <span>Unassigned</span> Tags: <span>Awaiting input...</span>		<b>Physical Infrastructure</b> Cabinet: <span>CNAF-DC / rack1</span> Device Class: <span>Select a template...</span> Height Position Half Depth: <input type="checkbox"/> Back Side: <input type="checkbox"/> Number of Data Ports Nominal Draw (Watts) Weight Power Connections Device Type: <span>Select...</span>	
<b>Custom Attributes</b> Classification		<b>Device Images</b> 	
		<b>SNMP Configuration</b> SNMP Version: <span>Configuration Default</span> SNMP Read Only Community Consecutive SNMP Failures* *Polling is disabled after three consecutive failures.	

Preview  


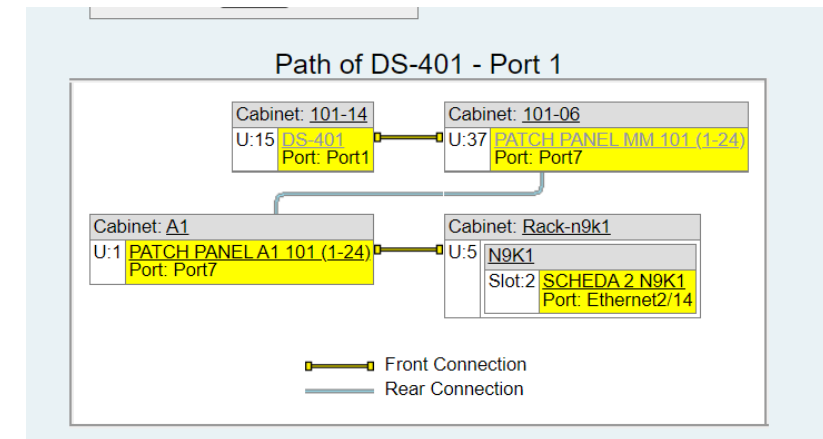
# Network connections

## Simple connections of a switch element

#	Port Name	Device	Device Port	Notes	Status	Media Type	Color Code
1	Gi/01	NOVA-206-01-24-4	Port1		✖	ethernet	
2	Gi/02	NOVA-206-01-24-4	Port2		✖	ethernet	
3	Gi/03	NOVA-206-01-25-3	Port1		✖	ethernet	
4	Gi/04	NOVA-206-01-25-3	Port2		✖	ethernet	
5	Gi/05	NOVA-206-01-26-4	Port1		✖	ethernet	
6	Gi/06	NOVA-206-01-26-4	Port2		✖	ethernet	
7	Gi/07	NOVA-206-01-27-3	Port1		✖	ethernet	
8	Gi/08	NOVA-206-01-27-3	Port2		✖	ethernet	
9	Gi/09	NOVA-206-01-28-4	Port1		✖	ethernet	
10	Gi/10	NOVA-206-01-28-4	Port2		✖	ethernet	
11	Gi/11	NOVA-206-01-29-3	Port1		✖	ethernet	
12	Gi/12	NOVA-206-01-29-3	Port2		✖	ethernet	
13	Gi/13				✖		
14	Gi/14				✖		
15	Gi/15				✖		
16	Gi/16				✖		
17	Gi/17				✖		
18	Gi/18				✖		
19	Gi/19				✖		
20	Gi/20				✖		
21	Gi/21				✖		
22	Gi/22				✖		
23	Gi/23				✖		
24	Gi/24				✖		
25	Gi/25				✖		
26	Gi/26				✖		
27	Gi/27				✖		
28	Gi/28				✖		
29	Gi/29				✖		
30	Gi/30				✖		
31	Gi/31				✖		
32	Gi/32				✖		
33	Gi/33				✖		
34	Gi/34				✖		
35	Gi/35				✖		
36	Gi/36				✖		
37	Gi/37	NOVA-206-01-29-1	Port1		✖	ethernet	
38	Gi/38	NOVA-206-01-29-1	Port2		✖	ethernet	
39	Gi/39	NOVA-206-01-28-2	Port1		✖	ethernet	
40	Gi/40	NOVA-206-01-28-2	Port2		✖	ethernet	
41	Gi/41	NOVA-206-01-27-1	Port1		✖	ethernet	
42	Gi/42	NOVA-206-01-27-1	Port2		✖	ethernet	
43	Gi/43	NOVA-206-01-26-2	Port1		✖	ethernet	
44	Gi/44	NOVA-206-01-26-2	Port2		✖	ethernet	
45	Gi/45	NOVA-206-01-25-1	Port1		✖	ethernet	
46	Gi/46	NOVA-206-01-25-1	Port2		✖	ethernet	
47	Gi/47	NOVA-206-01-24-2	Port1		✖	ethernet	
48	Gi/48	NOVA-206-01-24-2	Port2		✖	ethernet	
49	SFP01				✖		
50	SFP02				✖		
51	SFP03				✖		
52	SFP04				✖		
53	SFP05				✖		
54	SFP06				✖		



## Complete path connections with patch panels

#	Port Name	Device	Device Port	Notes	Media Type	Color Code
1	Port1	PATCH PANEL MM 101 (1-24)	Port7		fiber	
DS-401[Port1]→PATCH PANEL MM 101 (1-24)[Port7]→PATCH PANEL A1 101 (1-24)[Port7]→SCHEDA 2 N9K1[Ethernet2/14]						
2	Port2					



# Use-case: inventorying GPU devices

## Server

30		30	
29		29	
28		28	
27		27	
26	NOVA-ML-206-07-24	26	NOVA-ML-206-07-24(Rear)
25		25	
24		24	
23		23	

Asset Tracking	
Device ID	1313
Status	Production
Label	NOVA-ML-206-07-24
Serial Number	RK018480
Asset Tag	4666

Connections	#	Port Name	Device	Device Port
	1	Port1		
	2	Port2		
	3	PCI1	GPU_A30_ML_INFN_01	A30_GPU
	4	PCI2		

## GPU

Asset Tracking	
Device ID	1355
Status	Reserved
Label	GPU_A30_ML_INFN_01
Serial Number	1321821044985
Asset Tag	71211-0
Primary IP / Host Name	
Manufacture Date	1970-01-01
Install Date	2022-02-11
Warranty Company	NVIDIA
Warranty Expiration	2024-02-01
Last Audit Completed	Cabinet: Never
Departmental Owner	SDDS
Escalation Information	
Time Period	Select...
Details	Select...
Primary Contact	Dai Pra, Stefano
Tags	GPU

Physical Infrastructure	
Cabinet	CNAF-DC / 206-07
Device Class	Select a template...
Height	0
Position	0
Half Depth	<input type="checkbox"/>
Back Side	<input type="checkbox"/>
Number of Data Ports	1
Nominal Draw (Watts)	230
Weight	0
Power Connections	0
Device Type	Appliance

Device Images	
front of device	

SNMP Configuration	
SNMP Version	2c
SNMP Read Only Community	
Consecutive SNMP Failures*	0

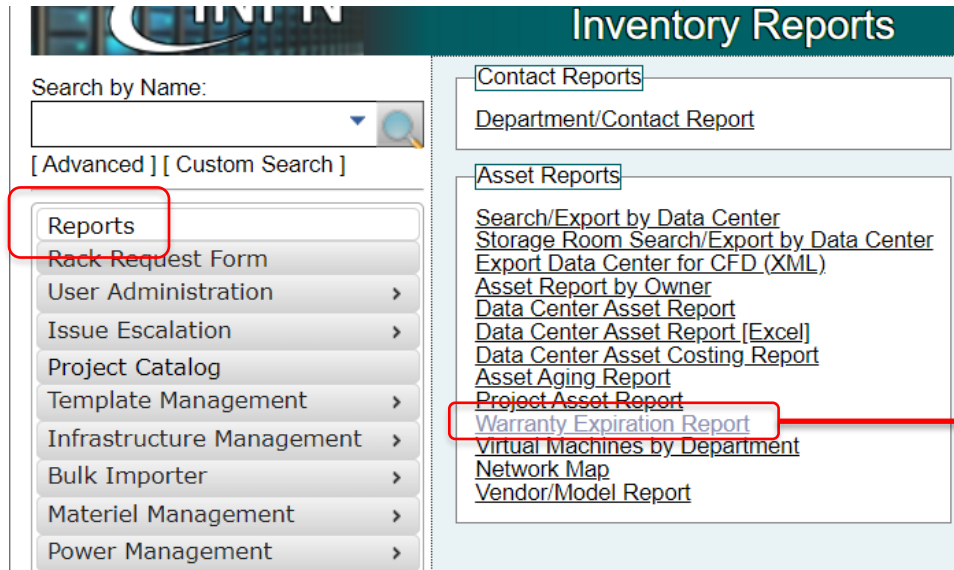
\*Polling is disabled after three consecutive failures.

Connections	#	Port Name	Device	Device Port	Note
	1	A30_GPU	NOVA-ML-206-07-24	PCI1	

# Verify warranty expirations

From **Reports** section



Collects warranty status in a PDF file

## Devices with 0-1 years of remaining warranty

Label	Remaining	Owner	Primary Contact
EQL 205-06_13-14	0 y 6 m 30 d	Farming	Andrea Chierici
BLADE_OVIRT_CLOUD	0 y 7 m 17 d	Farming	
CE02-HTC	0 y 7 m 17 d	Farming	Andrea Chierici
DBFARM-4	0 y 7 m 17 d	Farming	Andrea Chierici
QUANTA-ENC-205-06_31-3	0 y 7 m 17 d	Farming	Andrea Chierici

## Devices with 1-2 years of remaining warranty

Label	Remaining	Owner	Primary Contact
OVIRT05-SGSI	1 y 1 m 24 d	Farming	Andrea Chierici
OVIRT06-SGSI	1 y 1 m 24 d	Farming	Andrea Chierici
OVIRT07-SGSI	1 y 1 m 24 d	Farming	Andrea Chierici
OVIRT08-SGSI	1 y 1 m 24 d	Farming	Andrea Chierici

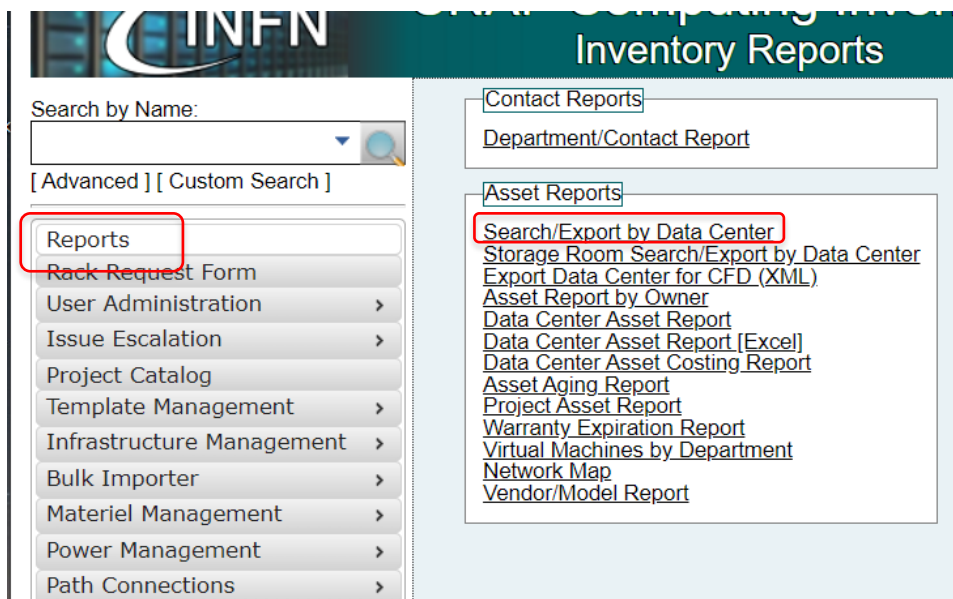
## Devices with 2-3 years of remaining warranty

Label	Remaining	Owner	Primary Contact
ENCL-NOVA-104-04-17	2 y 2 m 18 d	Farming	Andrea Chierici
ENCL-NOVA-104-05-17	2 y 2 m 18 d	Farming	Andrea Chierici
NOVA-104-04-17-01-SGSI	2 y 2 m 18 d	Farming	Andrea Chierici
NOVA-104-04-17-02-SGSI	2 y 2 m 18 d	Farming	Andrea Chierici

## Devices with expired warranty

Label	Expired	Owner	Primary Contact
CONSOLEISO27001.CNAF	52 y 4 m 12 d		Andrea Chierici
DOCUMENTALE SGSI	52 y 4 m 12 d		Barbara Martelli
ENCLOSURE 2U STANDAR	52 y 4 m 12 d		

# Verify warranty expirations



INFN Inventory Reports

Search by Name:

[ Advanced ] [ Custom Search ]

**Reports**

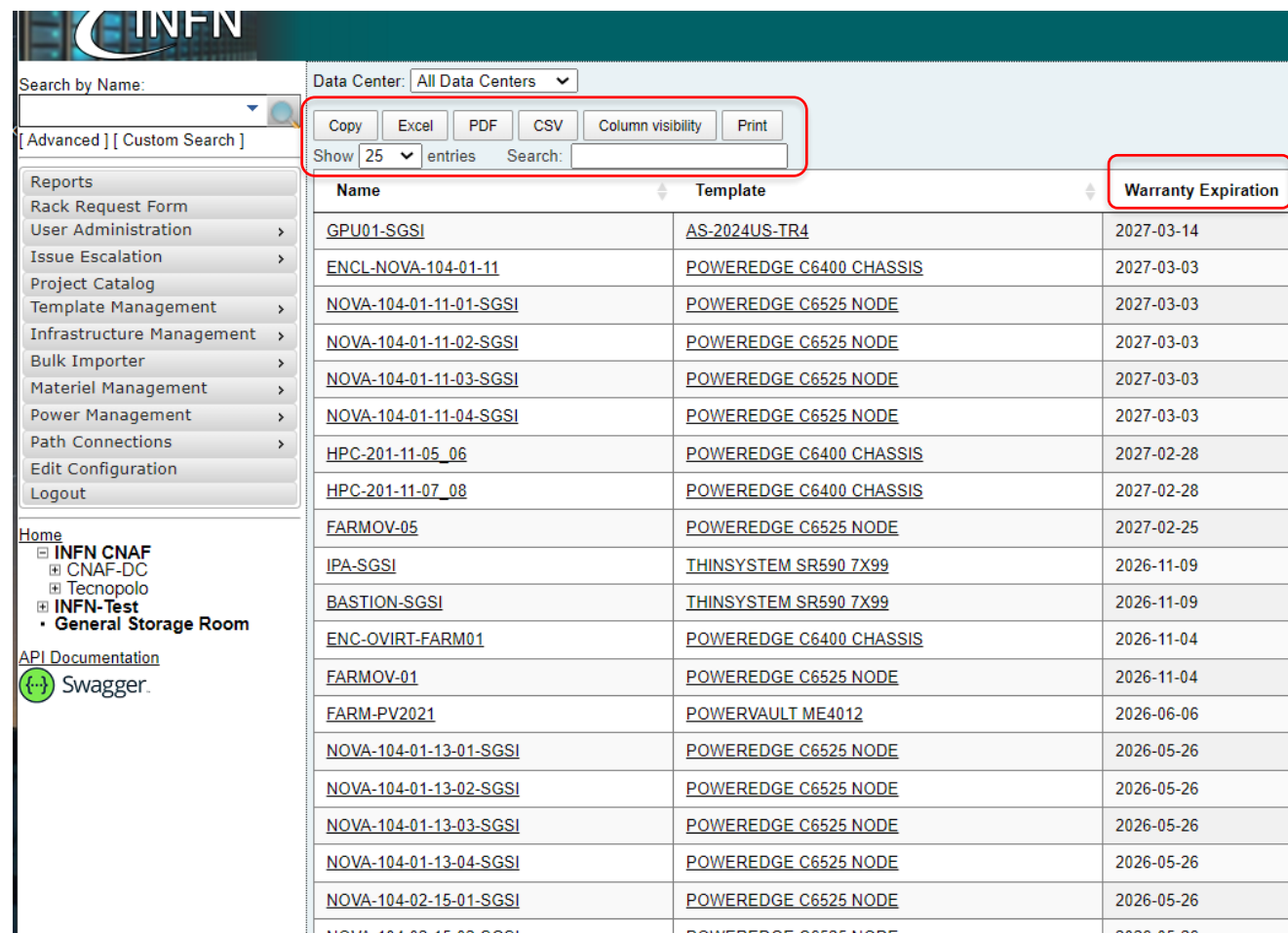
- Rack Request Form
- User Administration >
- Issue Escalation >
- Project Catalog
- Template Management >
- Infrastructure Management >
- Bulk Importer >
- Materiel Management >
- Power Management >
- Path Connections >

**Contact Reports**

- Department/Contact Report

**Asset Reports**

- Search/Export by Data Center**
- Storage Room Search/Export by Data Center
- Export Data Center for CFD (XML)
- Asset Report by Owner
- Data Center Asset Report
- Data Center Asset Report [Excel]
- Data Center Asset Costing Report
- Asset Aging Report
- Project Asset Report
- Warranty Expiration Report
- Virtual Machines by Department
- Network Map
- Vendor/Model Report



INFN Inventory Reports

Search by Name:

Data Center: All Data Centers

[ Advanced ] [ Custom Search ]

Copy Excel PDF CSV Column visibility Print

Show 25 entries Search:

Name	Template	Warranty Expiration
GPU01-SGSI	AS-2024US-TR4	2027-03-14
ENCL-NOVA-104-01-11	POWEREDGE C6400 CHASSIS	2027-03-03
NOVA-104-01-11-01-SGSI	POWEREDGE C6525 NODE	2027-03-03
NOVA-104-01-11-02-SGSI	POWEREDGE C6525 NODE	2027-03-03
NOVA-104-01-11-03-SGSI	POWEREDGE C6525 NODE	2027-03-03
NOVA-104-01-11-04-SGSI	POWEREDGE C6525 NODE	2027-03-03
HPC-201-11-05_06	POWEREDGE C6400 CHASSIS	2027-02-28
HPC-201-11-07_08	POWEREDGE C6400 CHASSIS	2027-02-28
FARMOV-05	POWEREDGE C6525 NODE	2027-02-25
IPA-SGSI	THINSYSTEM SR590 7X99	2026-11-09
BASTION-SGSI	THINSYSTEM SR590 7X99	2026-11-09
ENC-QVIRT-FARM01	POWEREDGE C6400 CHASSIS	2026-11-04
FARMOV-01	POWEREDGE C6525 NODE	2026-11-04
FARM-PV2021	POWERSVULT ME4012	2026-06-06
NOVA-104-01-13-01-SGSI	POWEREDGE C6525 NODE	2026-05-26
NOVA-104-01-13-02-SGSI	POWEREDGE C6525 NODE	2026-05-26
NOVA-104-01-13-03-SGSI	POWEREDGE C6525 NODE	2026-05-26
NOVA-104-01-13-04-SGSI	POWEREDGE C6525 NODE	2026-05-26
NOVA-104-02-15-01-SGSI	POWEREDGE C6525 NODE	2026-05-26
NOVA-104-02-15-02-SGSI	POWEREDGE C6525 NODE	2026-05-26

Home

- INFN CNAF
  - CNAF-DC
  - Tecnopolo
- INFN-Test
  - General Storage Room

API Documentation

Swagger

Query asset information and export them in one of the available formats

# Future ideas and developments

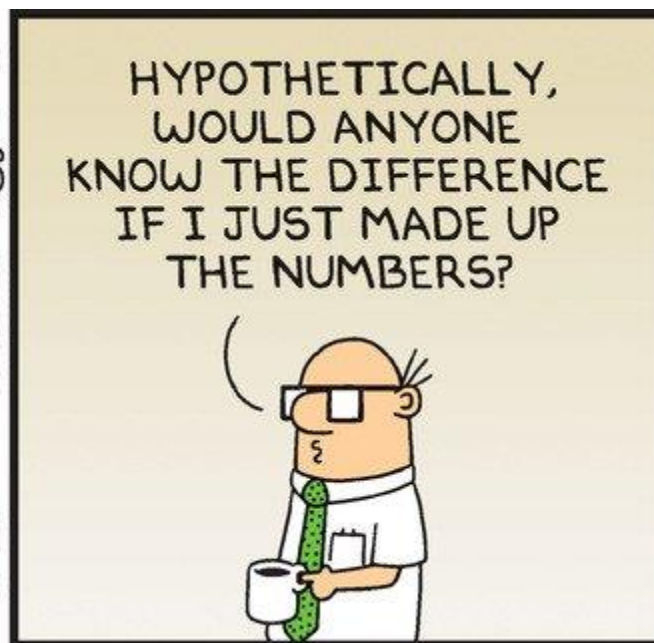
- Query the asset DB to populate a DHCP for IPMI connections
  - Obtain information by directly querying the database underneath
- Inspect and evaluate the use of Rest API
- Integration with barcode reader
  - Serial number acquisition
  - MAC addresses







Dilbert.com DilbertCartoonist@gmail.com



10-10-09 © 2009 Scott Adams, Inc./Dist. by UFS, Inc.

