

# An enterprise grade project with



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# Introduction

The project need erected based on the needs of the client that spent 25 years in office buildings with no automation, or very poor automation for the tenants.

The relocation of their offices required the fit-out to very well detailed specifications.

Requirements:

- presence detection for the office area
- movement detection for corridors
- constant lighting
- HVAC control
- access control integrated with presence detection
- UPS management and control
- electrical loads monitoring
- server room monitoring
- control of LCD privacy films on the meeting rooms glass walls
- meeting room management system
- web based application for the monitoring and control of all the automated equipment
- integration with the building existing BMS

# Our services for the project

- HVAC detailed design
- Electrical detailed design
- Security/Safety systems detailed design
- Execution of the electrical systems (including the automation systems)
- Commissioning of all M&E systems
- Software integration of all the systems

# Technologies/Protocols used

- DALI – Lighting control and monitoring
- KNX – HVAC control, presence, movement detection and user input devices
- RS-485 – Access control
- bacNet – Integration with the building's BMS
- TCP/IP – Meeting room management system and overall integration
- SNMP – UPS management
- RS-232 – Multimedia devices specific control



# Sheer numbers

- 5700 sqm area equally devised on 3 floors (17-19 out of 26 floors)
- 12 KNX bus lines
- 143 thermostats with 4 freely programmable push buttons
- 143 presence detectors
- 143 fan coil actuators
- 81 movement detectors
- 4 Blind actuators
- 4 switch actuators
- 15 DALI gateways
- 12 KNX/IP routers
- 4 KNX/Mitsubishi AC interfaces
- 1 weather station (installed on the roof above the 26th floor)
- 15 DALI bus lines (800 DALI drivers controlling 500 LED and fluorescent luminaries and 2500 meters of LED strip)
- 2 SNMP cards
- 7 in wall mounted tablets
- 2 TB iSCSI shared storage and MySQL embedded server
- 3 clustered Intel NUC Celeron 3700 with 8GB of RAM and 120GB SSD each installed in different locations
- 1 10/100 Mbps PoE 48 port switch
- 1 Gigabit managed switch
- 1 IP router with VPN

# Why openHAB

- very short period of time needed for the integration of all the protocols/functions
- modular architecture
- logging
- rule engine
- reliable back end server

# openHAB setup

- Version:1.8.2 (there will never be an upgrade to this setup, unless a special requirement comes from the client)

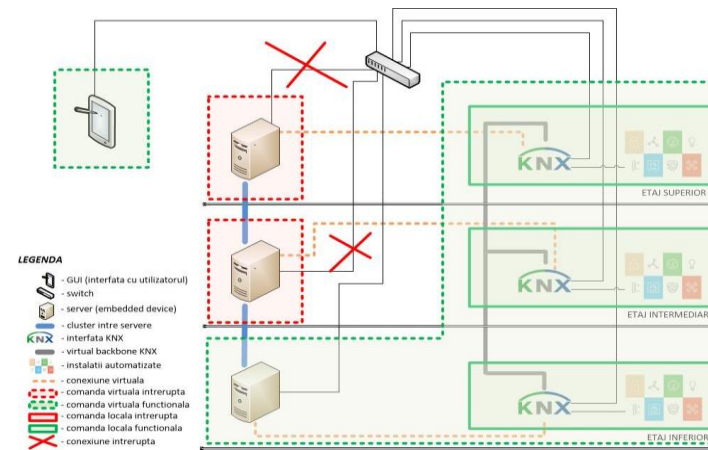
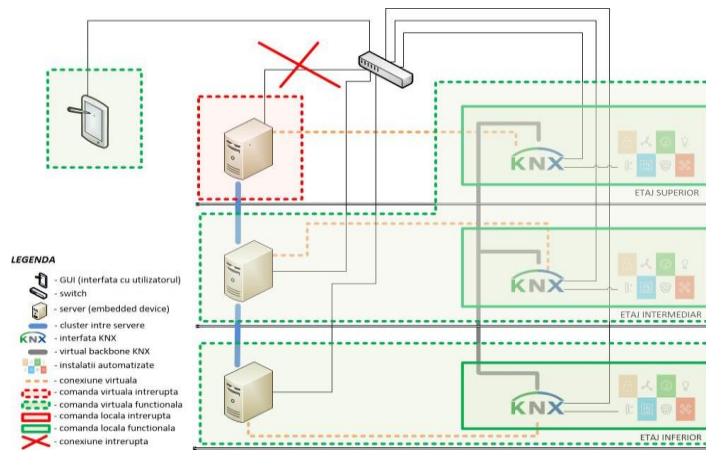
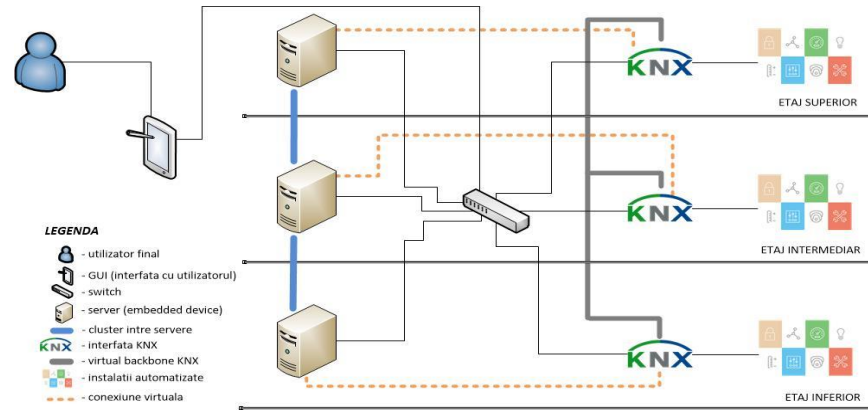
## Addons:

- KNX binding
- TCP UDP binding
- HTTP Binding
- Network binding
- NTP binding
- MapDB persistence
- MySQL persistence

## openHAB textual configuration

- 15700 items (e.g.: each lighting zone has 4 items)
- 260 rules (e.g.: user intervenes on setting his lighting outside of the constant lighting control)

# openHAB setup





# openHAB setup

Dashboard Administrare Vizualizeaza Securitate Exit

### Temperaturi masurate si setate

List - Temperaturi masurate si setate 10/22/2017

Quick search Columns Sorting Export Search

Descriere NNOKP	Descriere GTE	Temperatura masurata	Temperatura setata
17-01 Dr. muncii	N1-39	27.00	24.00
17-02 Dr. muncii	N1-40	26.70	24.00
17-03 Dr. muncii	N1-41	27.10	27.00
17-04 Concurenta	N1-42	26.90	28.00
17-05 Concurenta	N1-43	27.30	28.50
17-06 Proprietate Intelctuala	N1-44	26.70	24.00
17-07 Proprietate Intelctuala	N1-45	26.80	26.00
17-08 Proprietate Intelctuala	N1-24	26.60	27.00
17-09 Proprietate Intelctuala	N1-25	26.60	22.00
17-10 Proprietate Intelctuala	N1-26	26.90	24.00
17-11 Litigii	N1-27	26.80	22.00
17-12 Litigii	N1-28	27.10	29.00
17-13 Litigii	N1-29	27.10	22.00
17-14 Litigii	N1-30	26.50	26.00
17-15 Litigii	N1-31	26.80	24.00
17-16 Litigii	N1-32	27.00	27.00
17-17 Litigii	N1-33	26.20	21.50
17-18 Litigii	N1-34	25.50	21.50
17-19 Litigii	N1-35	25.50	21.50

List - Temperaturi masurate si setate

### Climatizare Server si UPS

N2-18/N2-19

Detalii functionare climatizare - unitati interne

Unitate interna 1 ON/OFF ☒

Unitate interna 2 ON/OFF ☒

Setpoint unitati interne 20.0 °C

Temperatura masurata UPS - unitate 1 19.0 °C

Temperatura masurata UPS - unitate 2 19.0 °C

Temperatura masurata Server - unitate 1 19.0 °C

Temperatura masurata Server - unitate 2 19.0 °C

Treapta ventilator UPS - unitate 1 4

Treapta ventilator UPS - unitate 2 4

Treapta ventilator Server - unitate 1 4

Treapta ventilator Server - unitate 2 4

Seteaza treapta ventilator pozitia 1 ☐

Seteaza treapta ventilator pozitia 2 ☐

Seteaza treapta ventilator pozitia 3 ☐

Seteaza treapta ventilator pozitia 4 ☒

Seteaza dirijor aer pozitia orizontala ☐

Seteaza dirijor aer pozitia verticala ☒

Seteaza dirijor aer pozitia intermediar 1 ☐

Seteaza dirijor aer pozitia intermediar 2 ☐

Seteaza dirijor aer pozitia intermediar 3 ☐

Remote control ON/OFF ☐

### Date climatice exterioare

Date climatice exterioare

Temperatura exterioara

Temperatura exterioara 17.1 °C

Nivel iluminare

Nivel iluminare Sud 0 Lux

Nivel iluminare Vest 0 Lux

Nivel iluminare Est 0 Lux

Viteza vant

Viteza vant 0.0 m/s

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Date climatice exterioare

# Data stored

openHAB creates 5000 inserts/hour in the MySQL database based on state changes and in some cases based on time settings for:

- Measured ambient temperature
- Setpoint for the ambient temperature
- Operating modes of the HVAC equipment
- Reported errors of all the equipment
- Brightness level
- User input (e.g. pressing of a push button)
- Reported operating hours of equipment
- ...

Basically... everything monitored!

# Photos





# Photos

