NetworkTree

A centralized architecture to manage IOC networks

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Outline

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Motivation

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- Managing IOCs networks can become quite challenging for big facilities.
- IOCs are or can be organized in a logic tree structures (areas, subsystems, crates, cpus, etc..).
- There are a number of components on the control system that depend on this logical tree structure
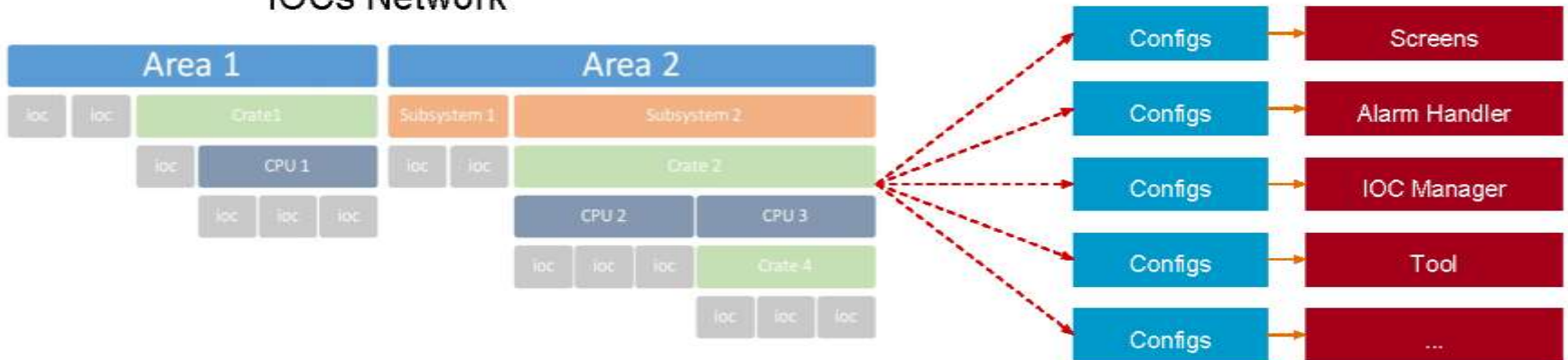
Motivation

- As IOCs are deployed or decommissioned, all of these components need to be reconfigured, redesigned and updated.
- This is usually a lot of work and might easily lead to incoherences.
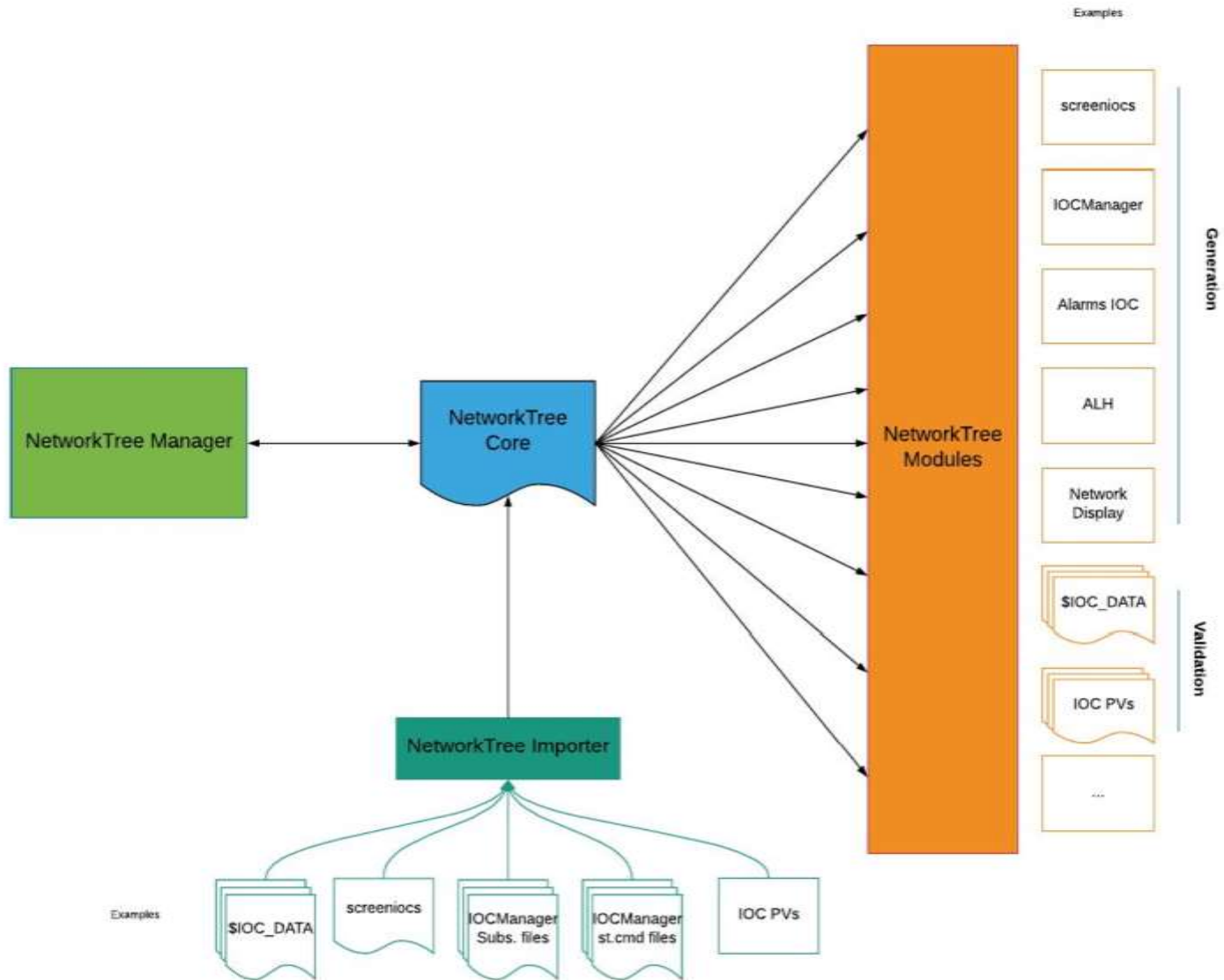- What is the source of truth?
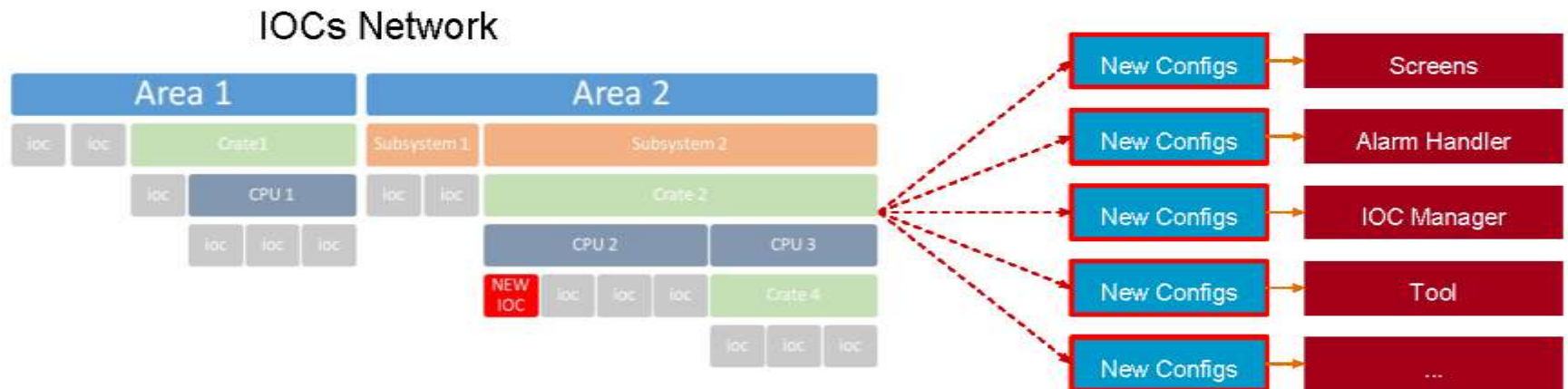
Objectives

- Keep and maintain the logical structure of the IOC network at a single point that becomes the source of truth for all other elements.

- Prevent incoherencies and ambiguities between the different elements of the system.
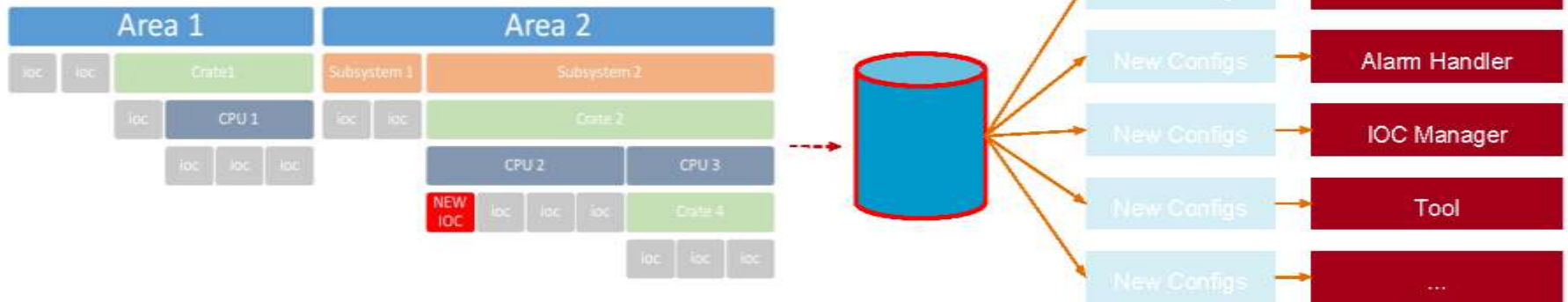
Architecture

NetworkTree Core

- The NetworkTree Core has the description of the **logic structure** of the IOCs network.

- It includes **all the information** that all the NetworkTree modules need to generate theirs configuration files.

- It's **flexible** to accommodate different **network architectures**.

- It doesn't have necessarily to be a tree. Some relations are not linear.

- It's **flexible** to accommodate different **type of devices** that not being IOCs are part of the IOCs network (some examples are terminal servers, power switches,...).

- Now it is implemented in a JSON file.

- We might evaluate the possibility of using a different way of storing this information (YAML, Relational DBs, …).

- The Core also includes a set of scripts to manage and run the Manager, importer and different modules.
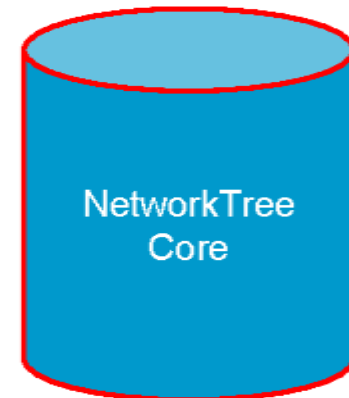
NetworkTree Core

NetworkTree Importer and Manager

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- Tools to feed the NetworkTree Core

- **NetworkTree Importer**
  - Import IOCs Network structure from existing sources. Check for coherence.
- **NetworkTree Manager**
  - GUI Tool to explore, add, remove or update elements to the tree.

- The NetworkTree core can always be edited by hand, but these tools make it easier for the user and do some validations to avoid human errors.
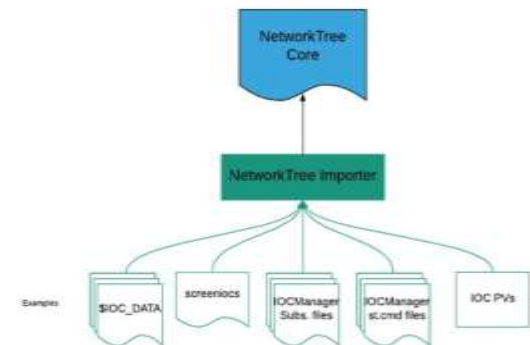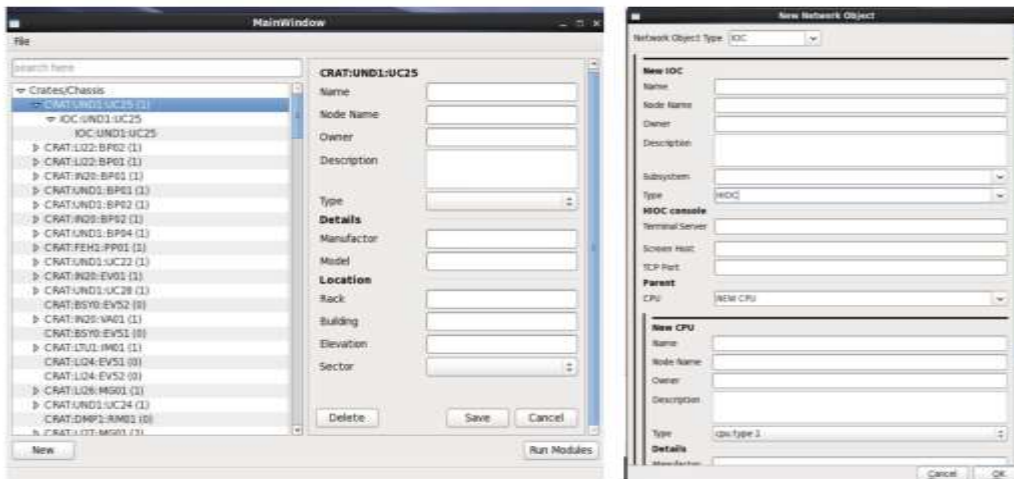
NetworkTree Modules

- NetworkTree Modules are responsible for **propagating changes** in the NetworkTree Core to all the others control system components that depend on it.
- **Automate** config files generation (something that can be very time consuming).
- Guarantees **coherence** across the whole system.
- Each module does **version control** keeping a relation between generated config files and NetworkTree Core versions.
- NetworkTree Modules can also be used for validation instead of generation.
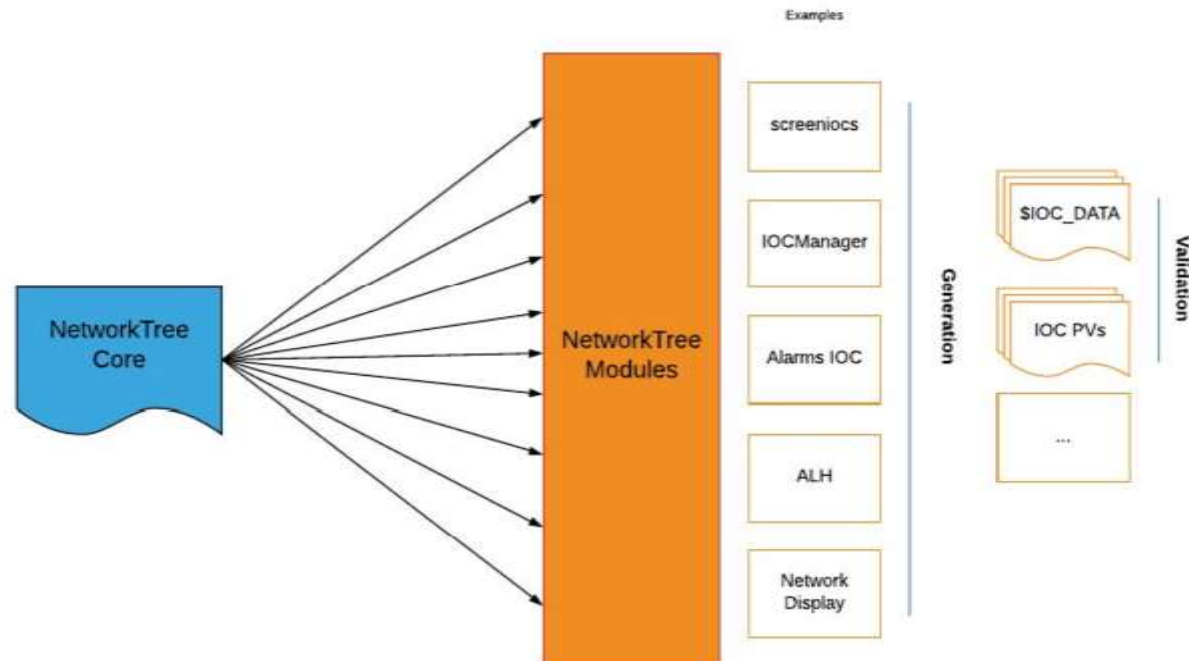
LCLS Example: Network Screen

- Screens to browse, overview the status and and have access to the configuration of all IOCs in LCLS

LCLS Example: PyDM Network Screens

- Screens to browse, overview the status and and have access to the configuration of all IOCs in LCLS

LCLS Example: AHL

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- Generate AHL configuration files to automatically create group alarms per IOC, Subsystems and Sectors.

Thank you!

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