

Ametsa: a Generic Home Control System based on UPnP

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Outline

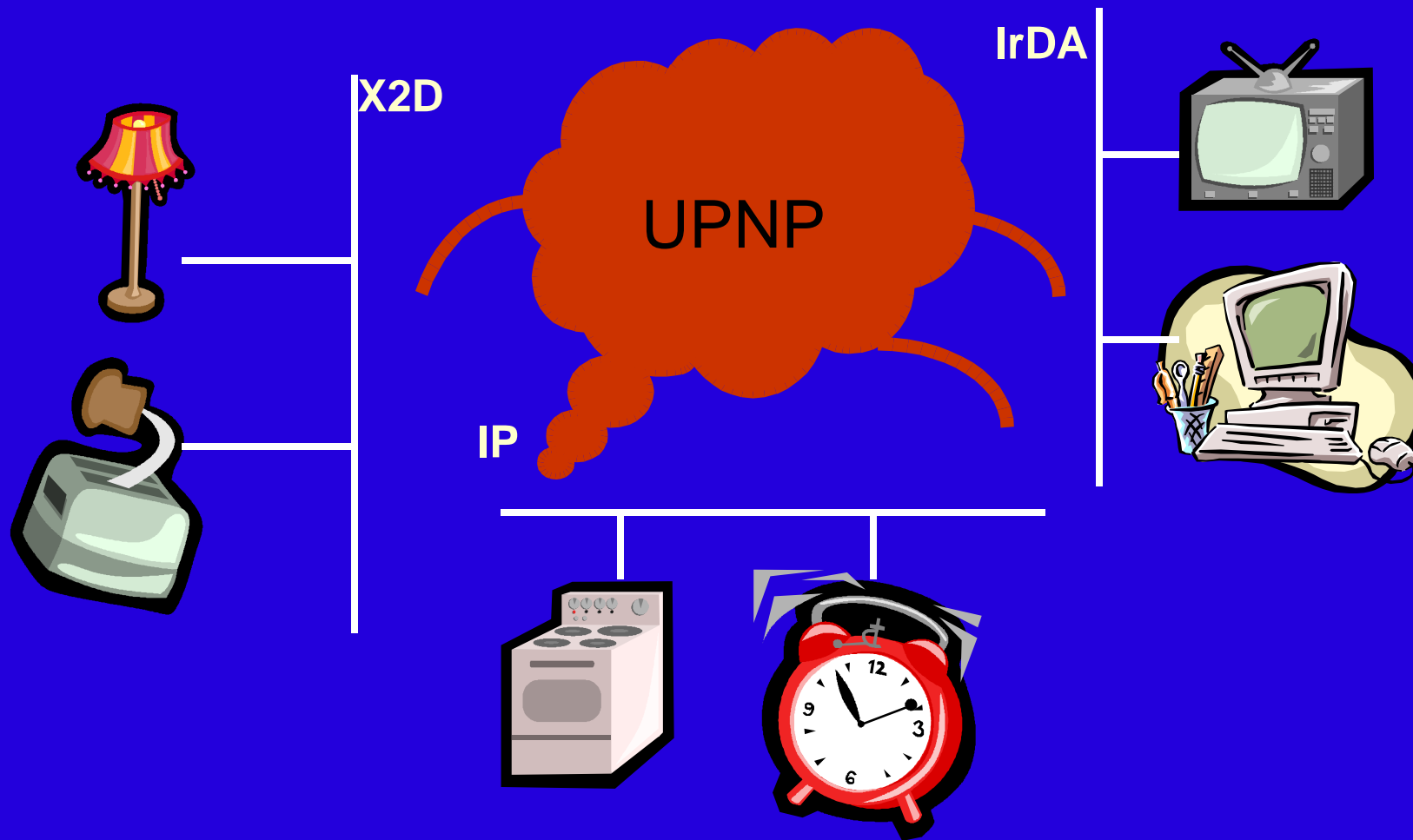
- x "Maison Intelligente" Project
- x UPnP Technology
- x Ametsa Control Point
- x UPnP-X2D/X10 Gateways
- x Conclusion and Future Work

"Maison Intelligente" Project

x Goals

- ✓ Improve autonomy of impaired people by proposing a universal home control device
 - Devices manufacturer independent

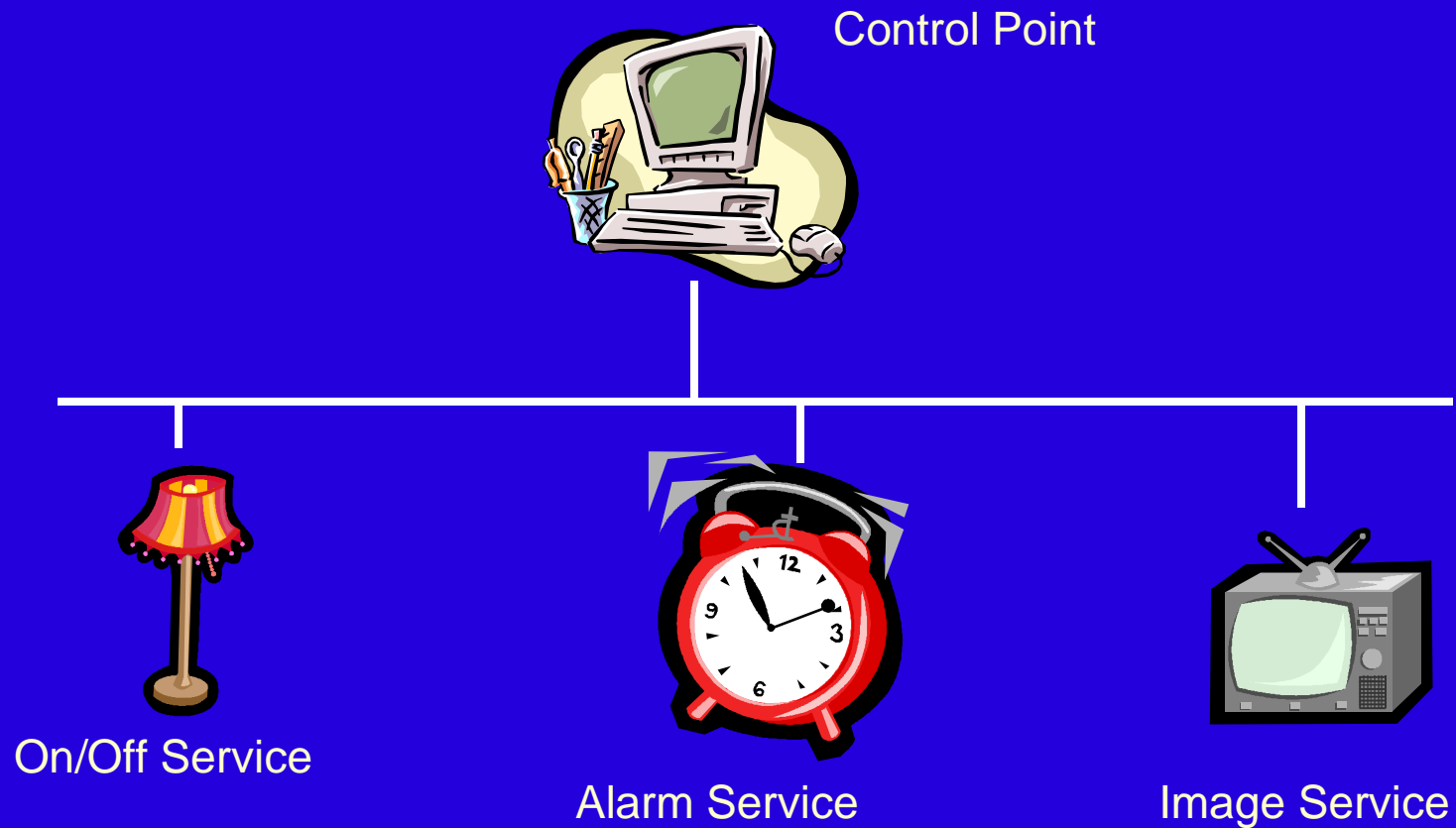
"Maison Intelligente" Project (2)



UPnP: Universal Plug and Play

- x Peer-to-Peer local network connectivity of intelligent appliances, wireless devices and PCs
- x Standard-based connectivity to ad-hoc or unmanaged networks
- x Uses IP, TCP, UDP, HTTP, and XML

UPnP Components



UPnP (2)

- x UPnP devices
 - ✓ Auto IP configuration
 - ✓ Convey their capabilities
 - ✓ Leave the network smoothly
- x UPnP control points
 - ✓ Learn about the presence and capabilities of devices
 - ✓ Use those capabilities

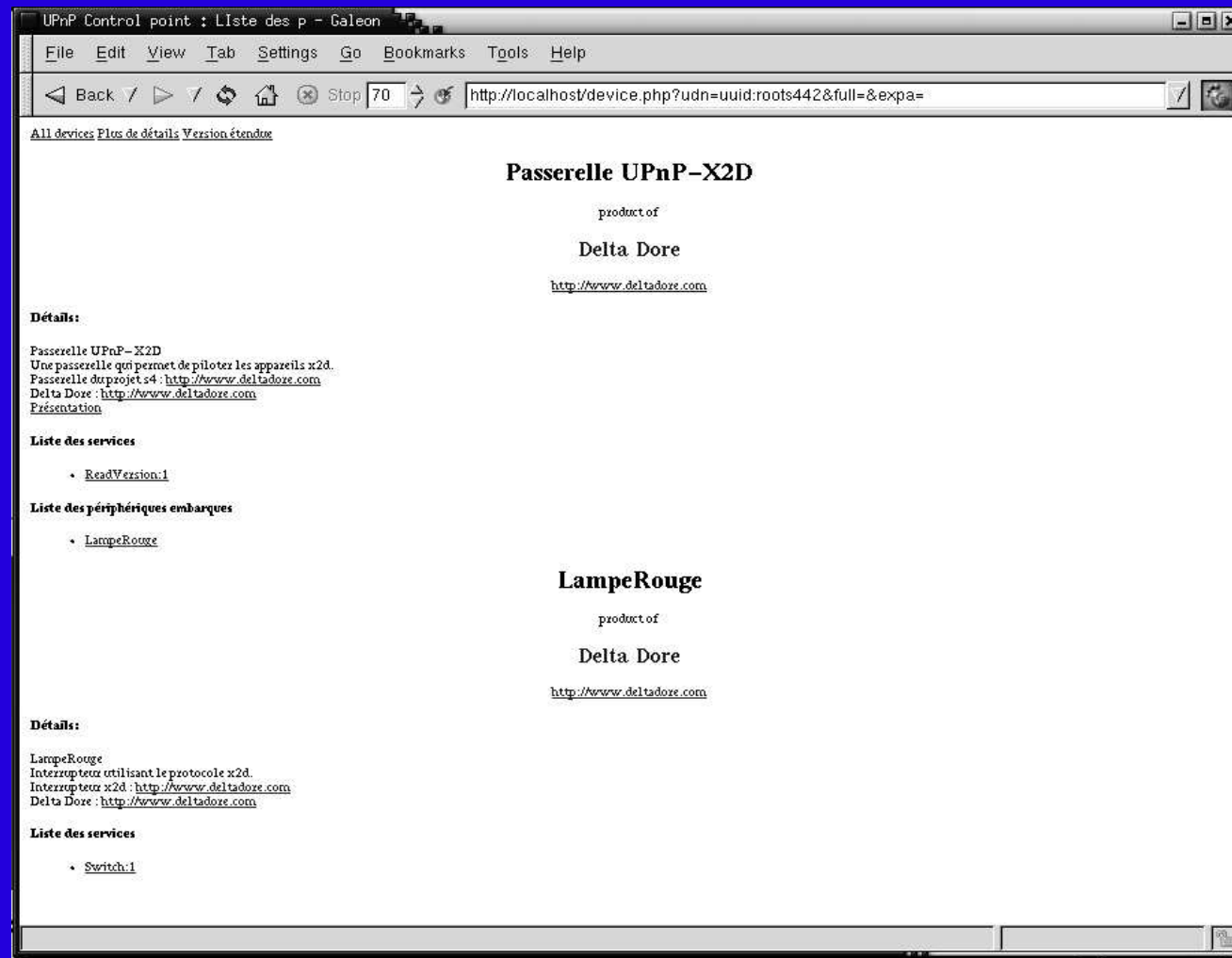
UPnP Protocols

- x Address configuration
 - ✓ Auto-IP, DHCP
- x Discovery and search
 - ✓ SSDP, MSEARCH
- x Control
 - ✓ SOAP
- x Events
 - ✓ GENA

Ametsa Control Point

- x Developped upon the Intel's UPnP implementation
- x Learns about the state of the UPnP network
 - ✓ Available UPnP devices
 - ✓ State of their services represented by a (set of) variable (e.g. *Control* variable for the On/Off service of a lamp)
- x Sends actions to devices
- x Accessible via a shell and SOAP interfaces

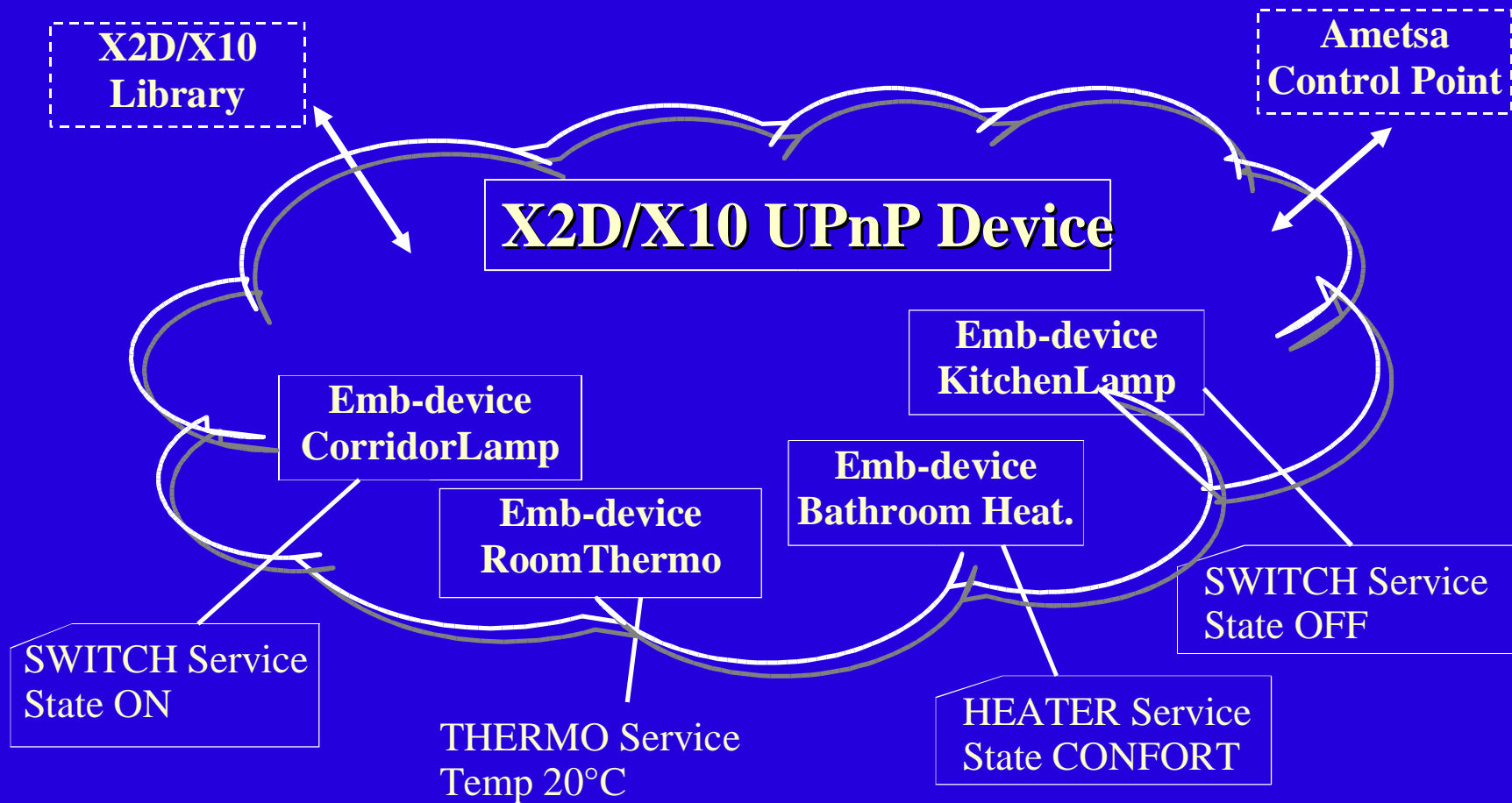
Ametsa User Interface



UPnP-X2D/X10 Gateways

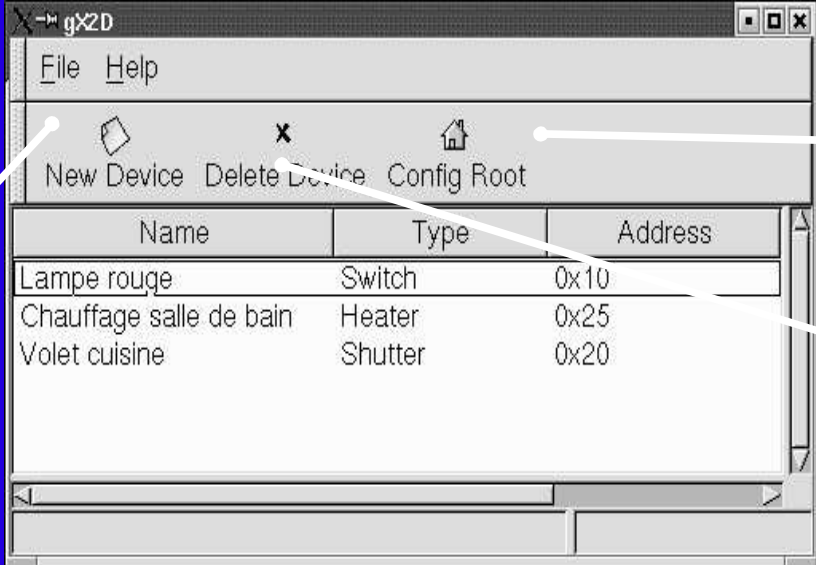
- x X2D, X10
 - ✓ Powerline and radio communication protocols
 - ✓ Frequently used to control home devices
- x Need for a gateway to the UPnP network
 - ✓ Implemented as an UPnP device giving access to X2D/X10 physical devices (lamps, shutters, heating)

UPnP-X2D/X10 Gateways (2)



Gateways Administration Interface

- x Add/delete a X2D/X10 device



The screenshot shows a window titled "gX2D" with a menu bar containing "File" and "Help". Below the menu bar is a toolbar with three icons: a diamond, a crossed-out diamond, and a house. Below the toolbar is a table with three columns: "Name", "Type", and "Address". The table contains three rows of data. To the left of the window, the word "Add" is written in white, with an arrow pointing to the diamond icon in the toolbar. To the right of the window, the words "Basic Configuration" and "Delete" are written in white, with arrows pointing to the house icon and the crossed-out diamond icon respectively.

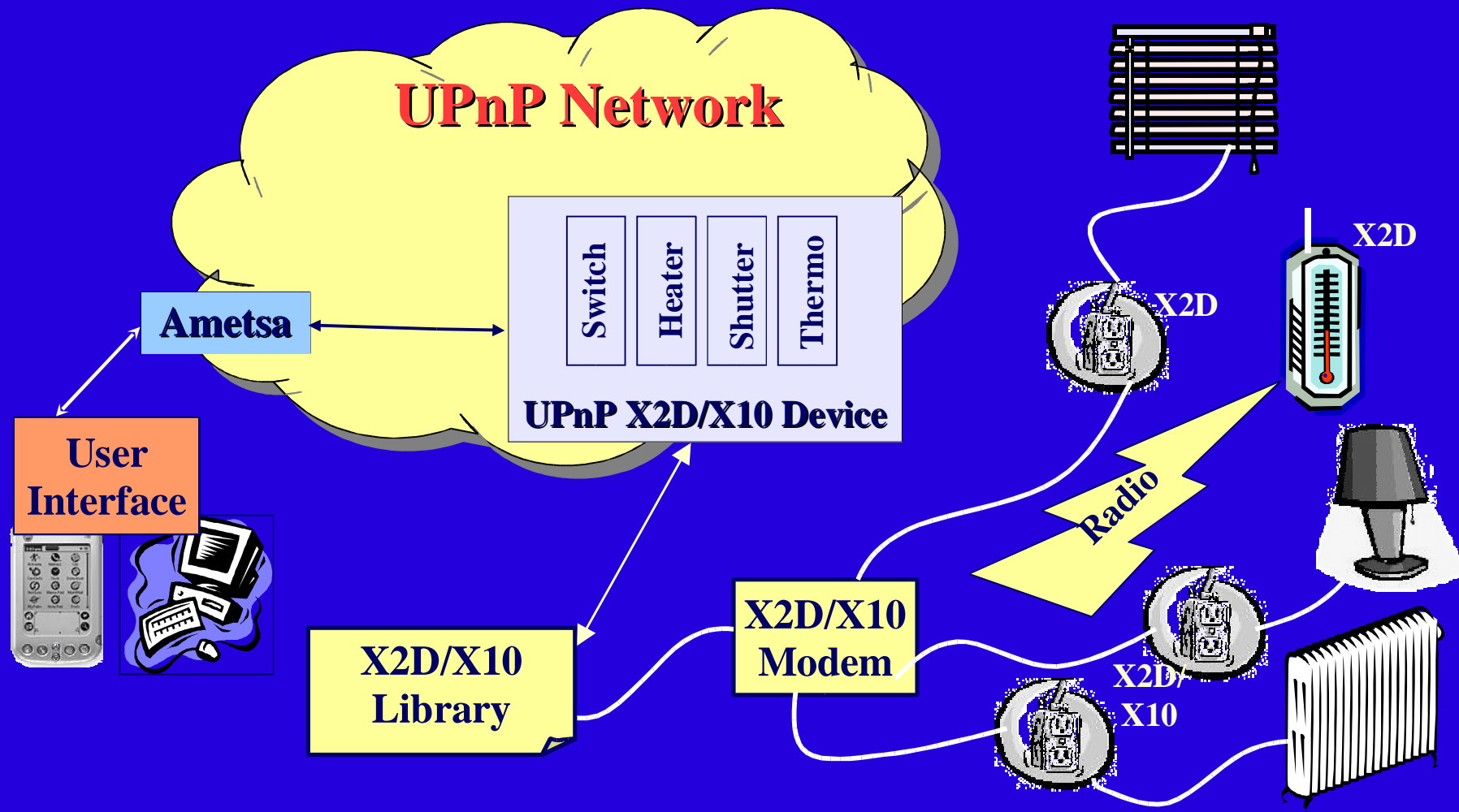
Name	Type	Address
Lampe rouge	Switch	0x10
Chauffage salle de bain	Heater	0x25
Volet cuisine	Shutter	0x20

Add

Basic Configuration

Delete

Experimentation Platform



Conclusion and Future Work

- x Generic home control system
 - ✓ Based on a standard technology
 - ✓ Devices manufacturers independent
- x Work in progress
 - ✓ Python-based UPnP implementation
 - ✓ Ametsa v2: CORBA interface+python UPnP
 - ✓ Adaptation to blind people
 - ✓ Programming a list of actions to be performed

