

**DCGI**

DEPARTMENT OF COMPUTER GRAPHICS AND INTERACTION

# SMART HOME USER INTERFACES FOR ELDERLY AND PEOPLE WITH DISABILITIES

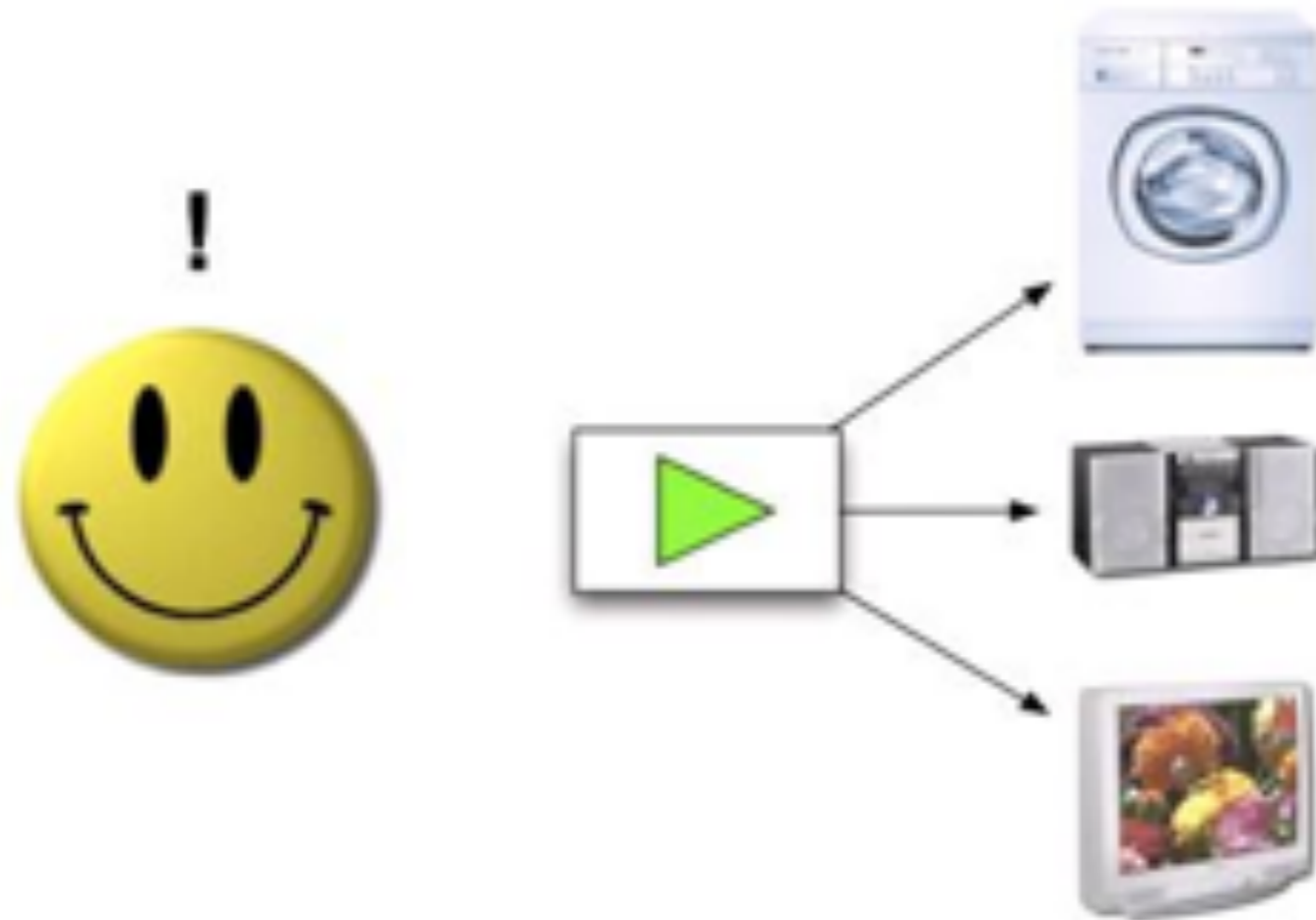
Miroslav Macík

Martin Klíma

# MOTIVATION



# MOTIVATION



# URC

- ▶ **U**niversal **R**emote **C**onsole
  - ... through which a user accesses and controls
  - ... any electronic & IT product or service
- ▶ ISO Standardised (ISO/IEC 24752)
- ▶ Core part - **U**niversal **C**ontrol **H**ub



# URC | MIDDLEWARE FOR SMART HOME

# URC | MIDDLEWARE FOR SMART HOME

WebClient

.NET Client

Smartphone

Clients

# URC | MIDDLEWARE FOR SMART HOME

WebClient

.NET Client

Smartphone

Clients

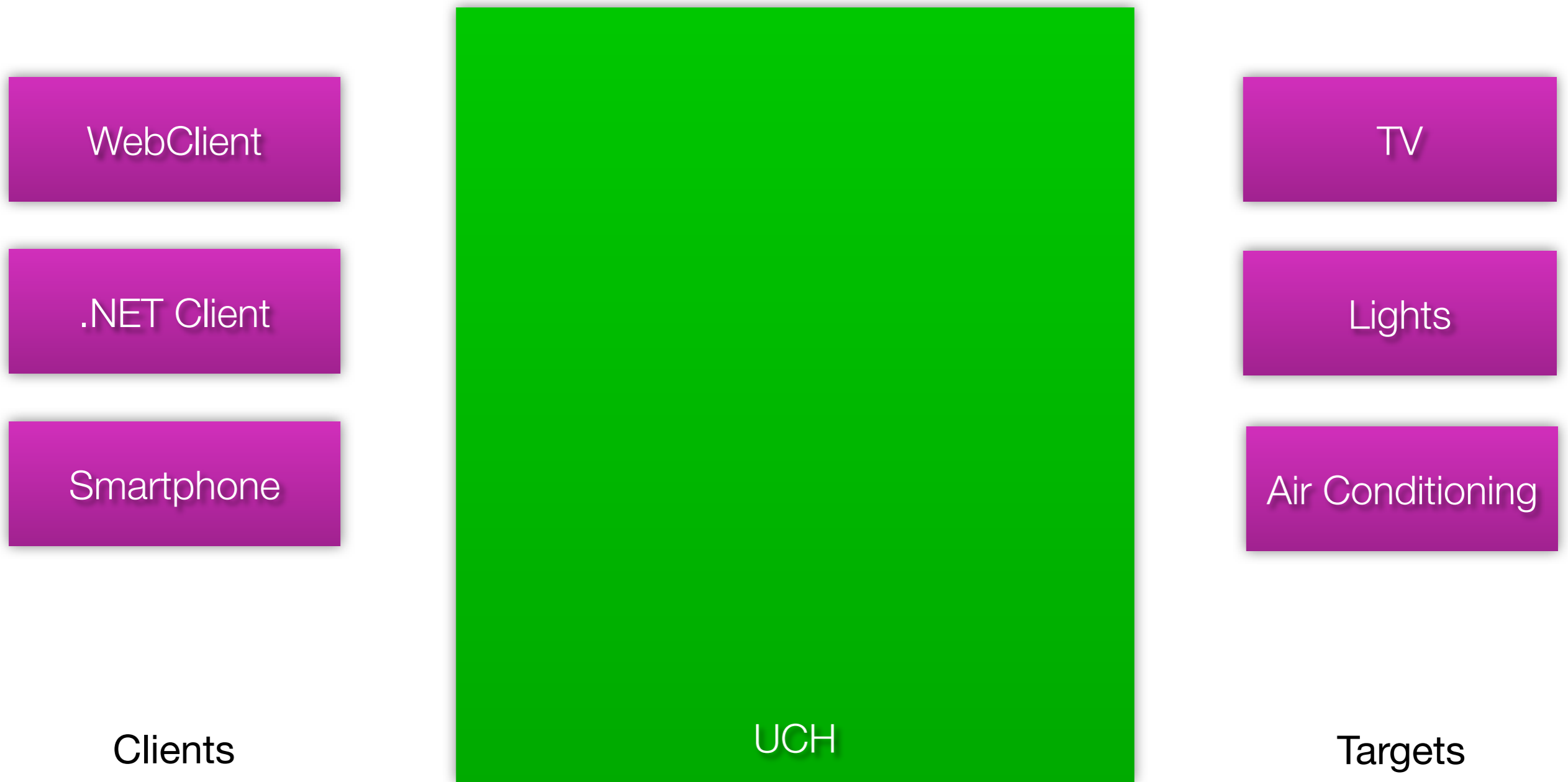
TV

Lights

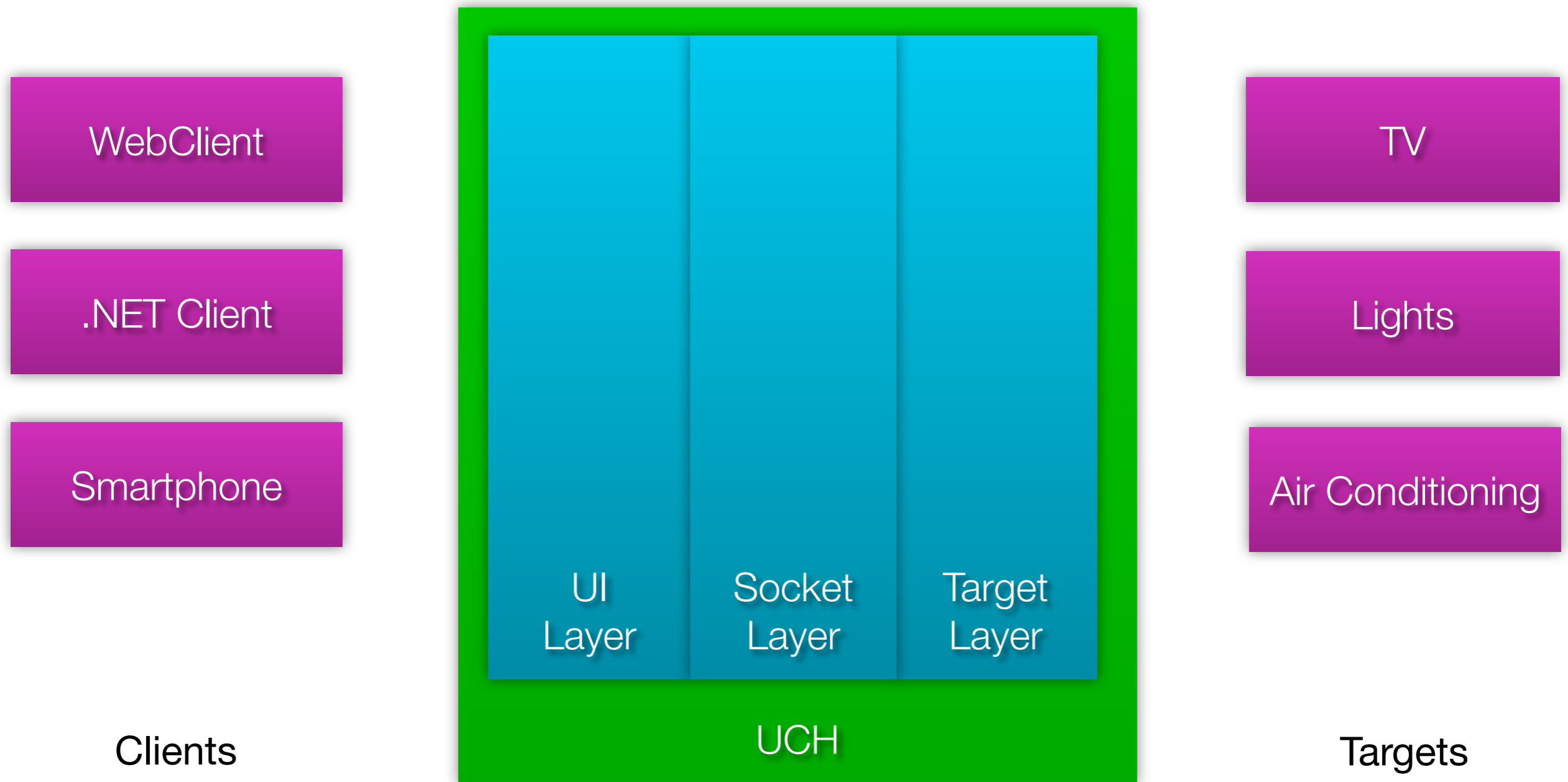
Air Conditioning

Targets

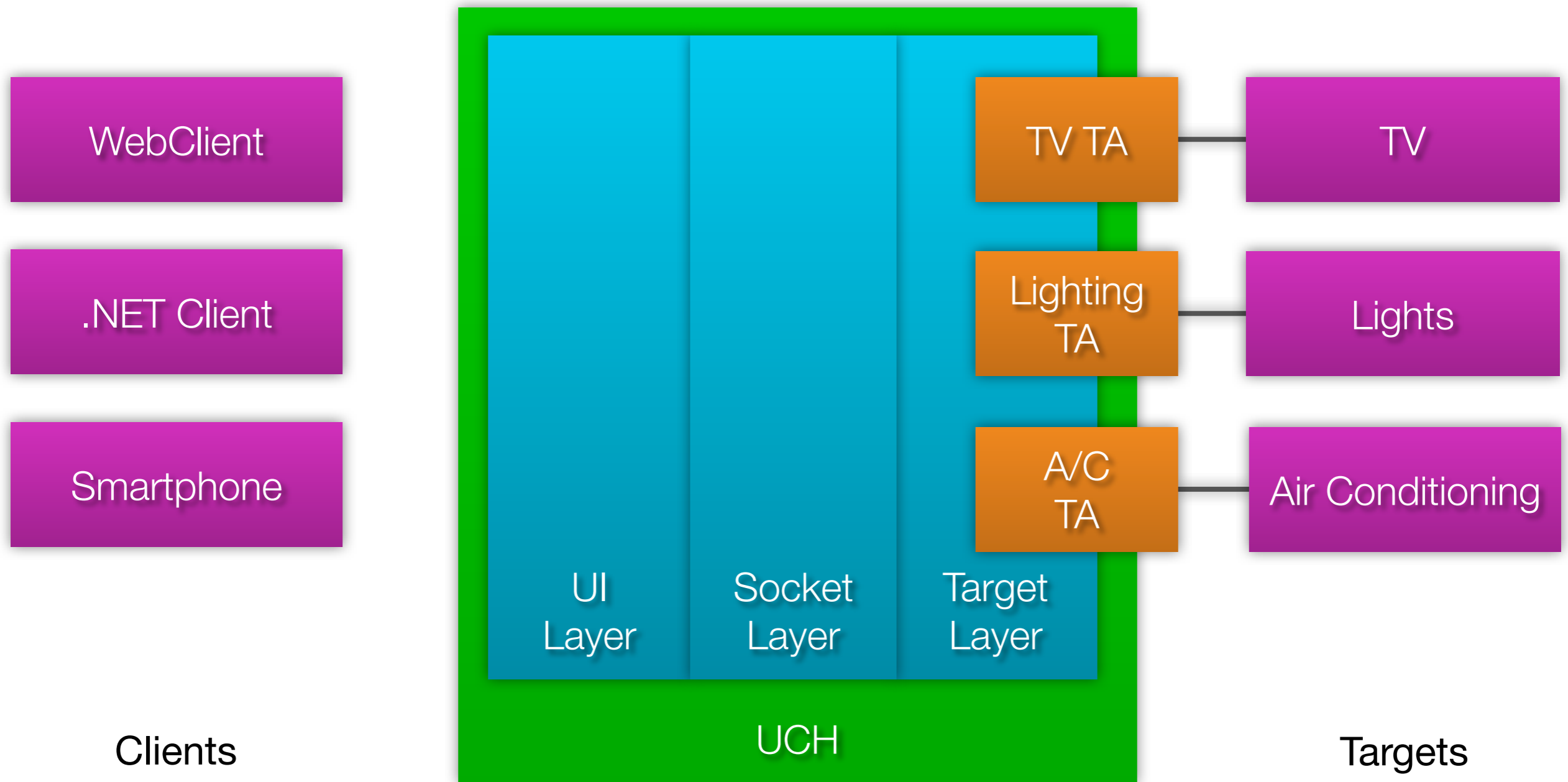
# URC | MIDDLEWARE FOR SMART HOME



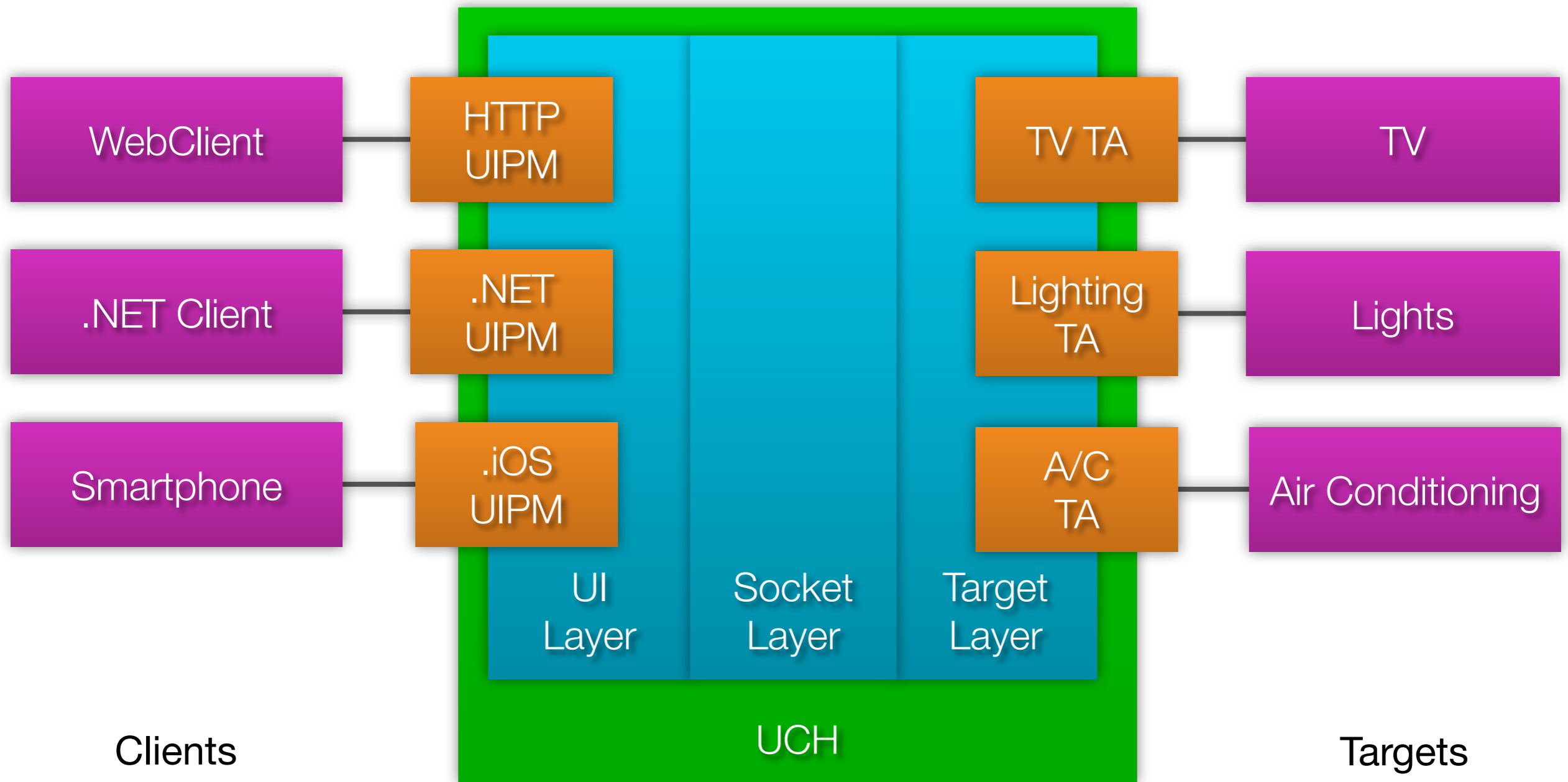
# URC | MIDDLEWARE FOR SMART HOME



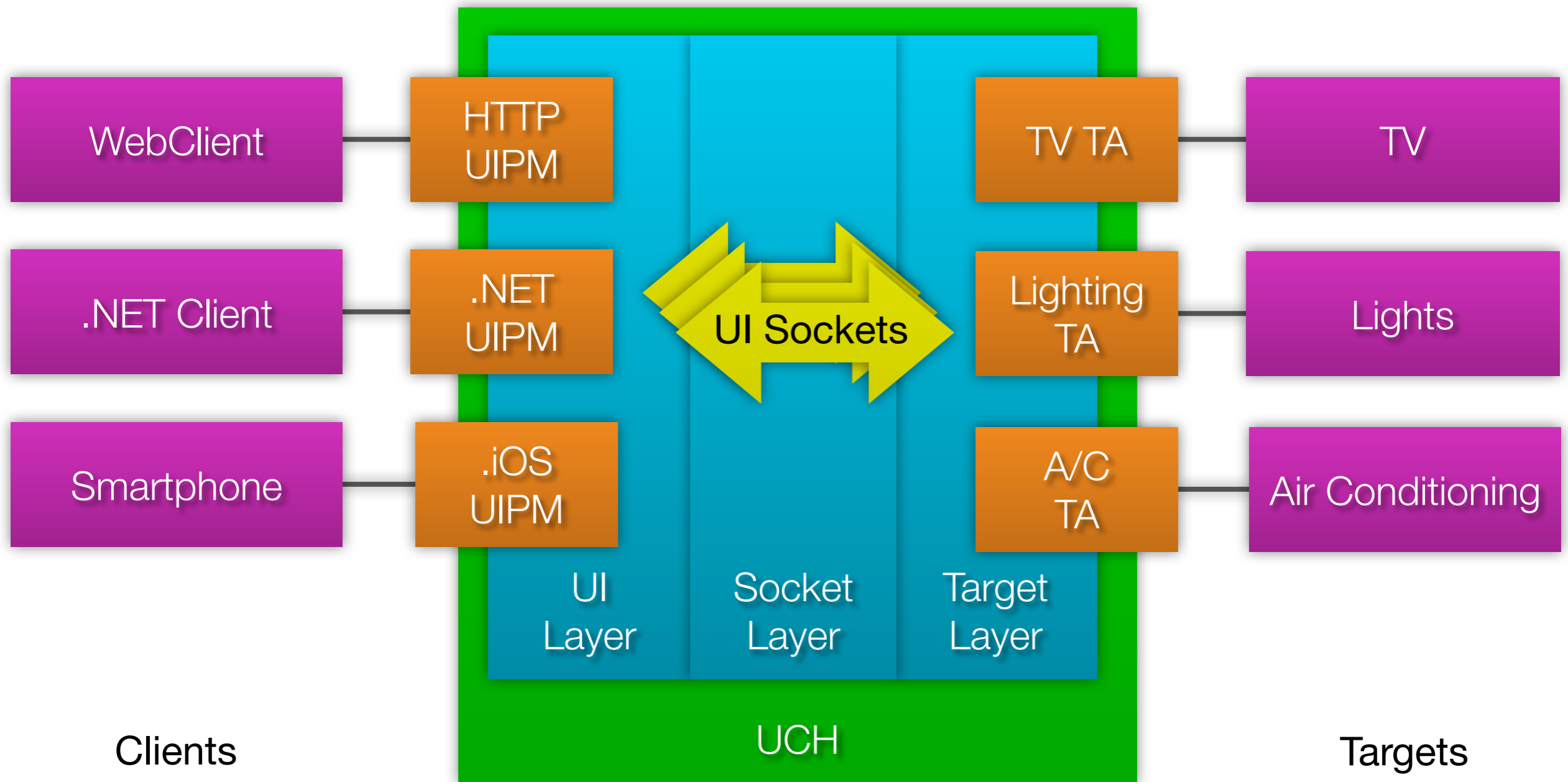
# URC | MIDDLEWARE FOR SMART HOME



# URC | MIDDLEWARE FOR SMART HOME

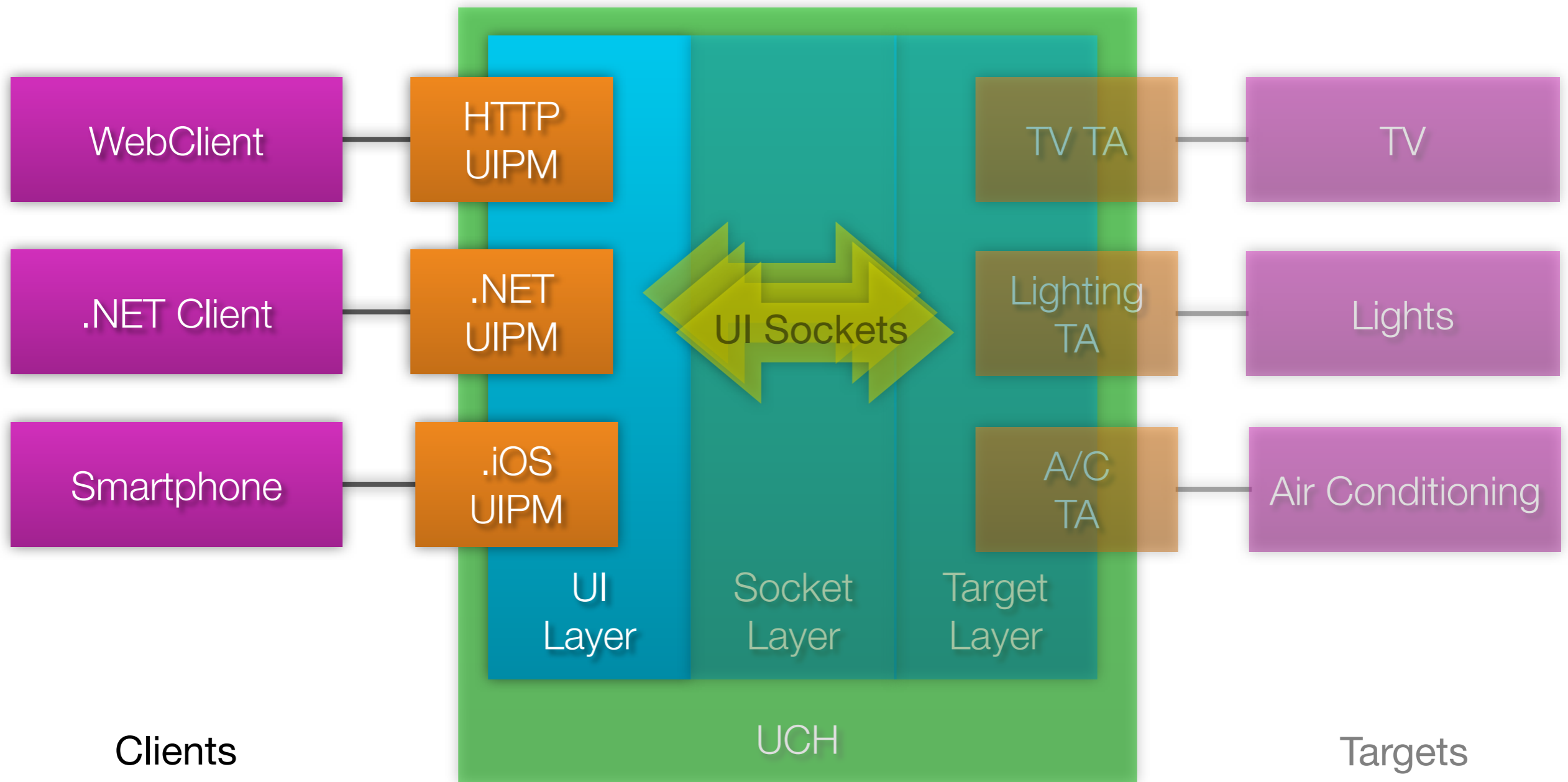


# URC | MIDDLEWARE FOR SMART HOME





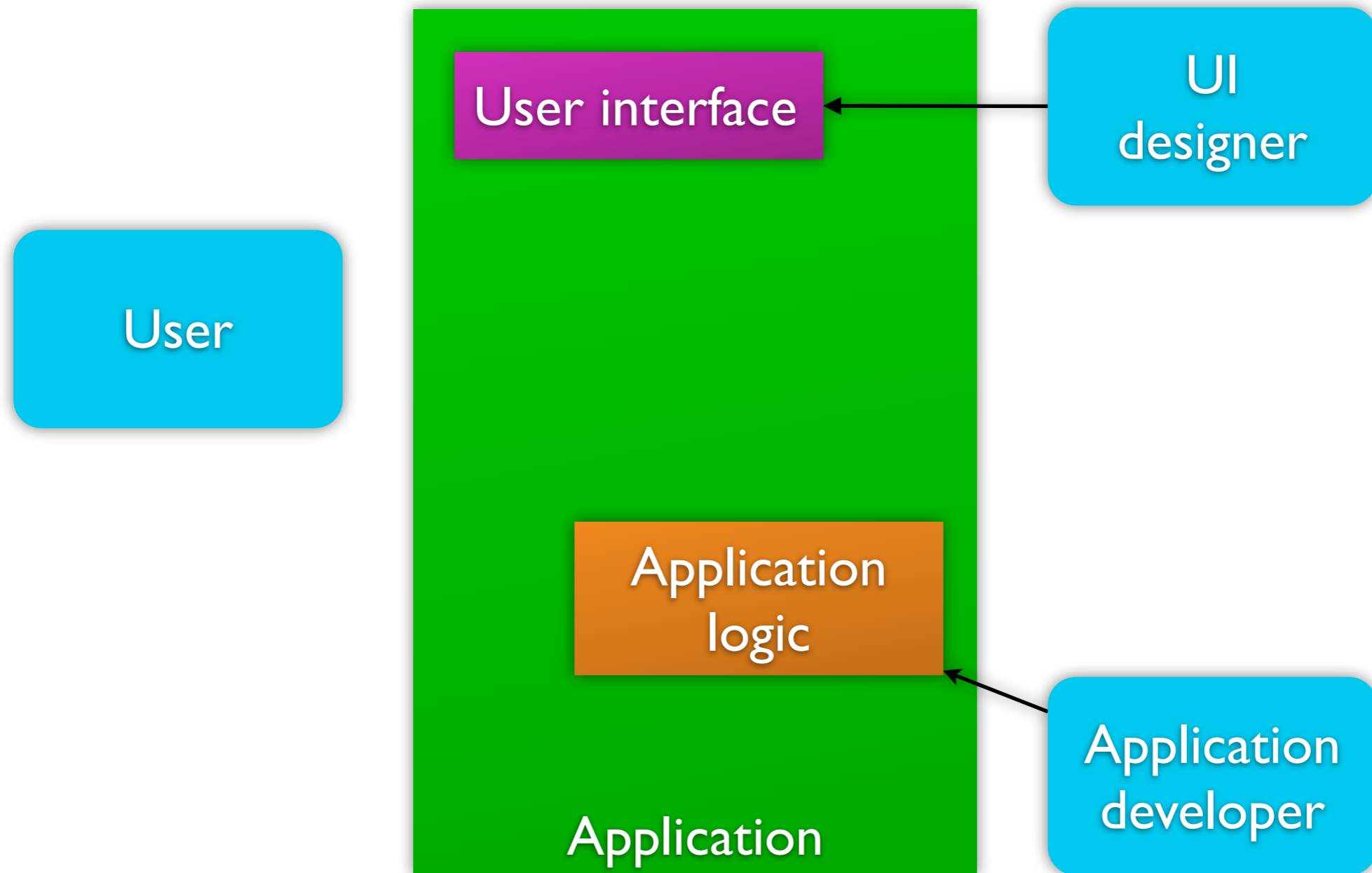
# URC | MIDDLEWARE FOR SMART HOME



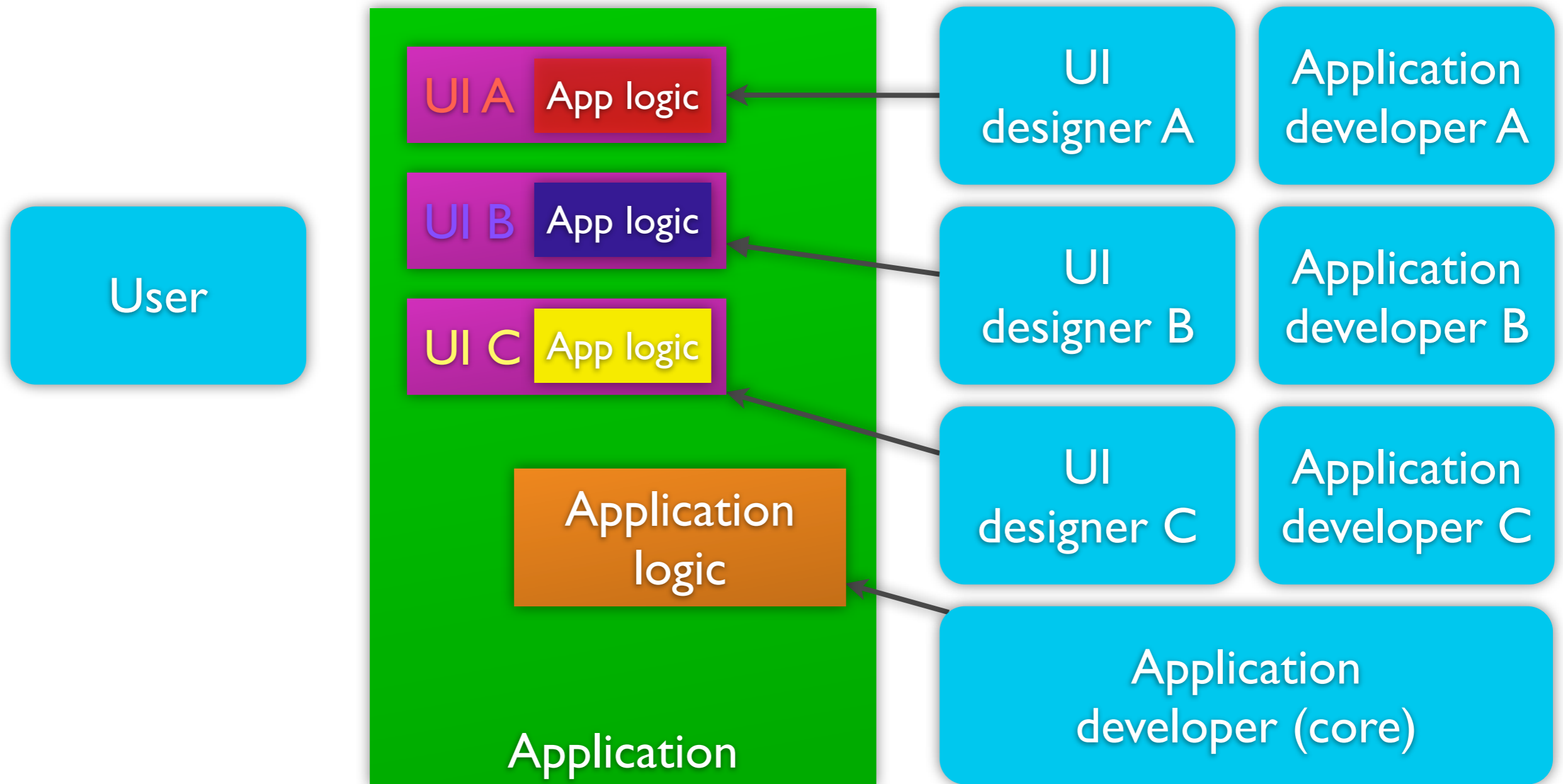
# URC | USER INTERFACES

- ▶ original UCH covers communication between clients and targets
- ▶ user interfaces are platform specific
  - high development and maintenance costs
- ▶ solution: **User Interface Platform**
  - single interface for any client platform

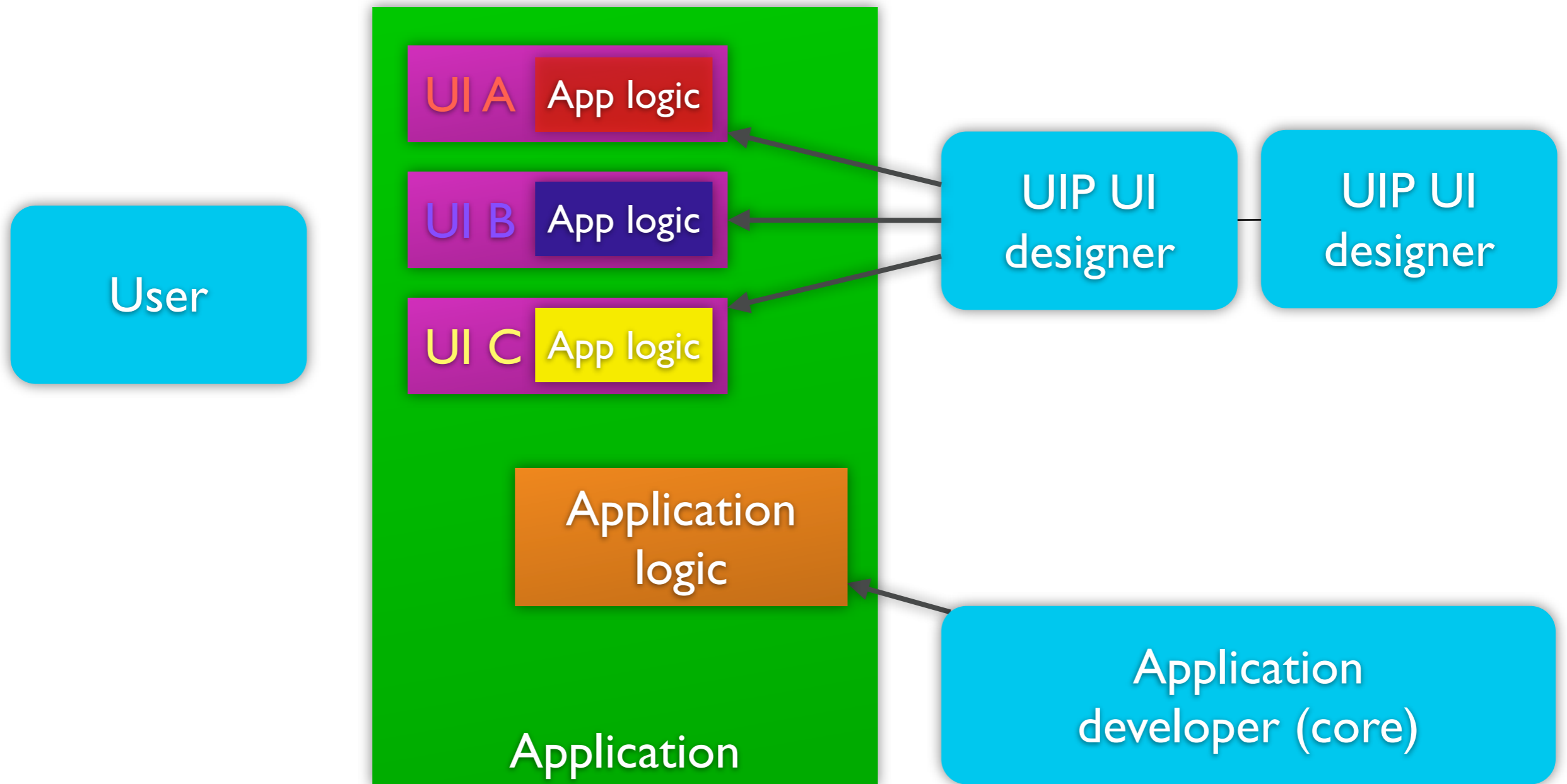
# UIP MOTIVATION | SIMPLE UI



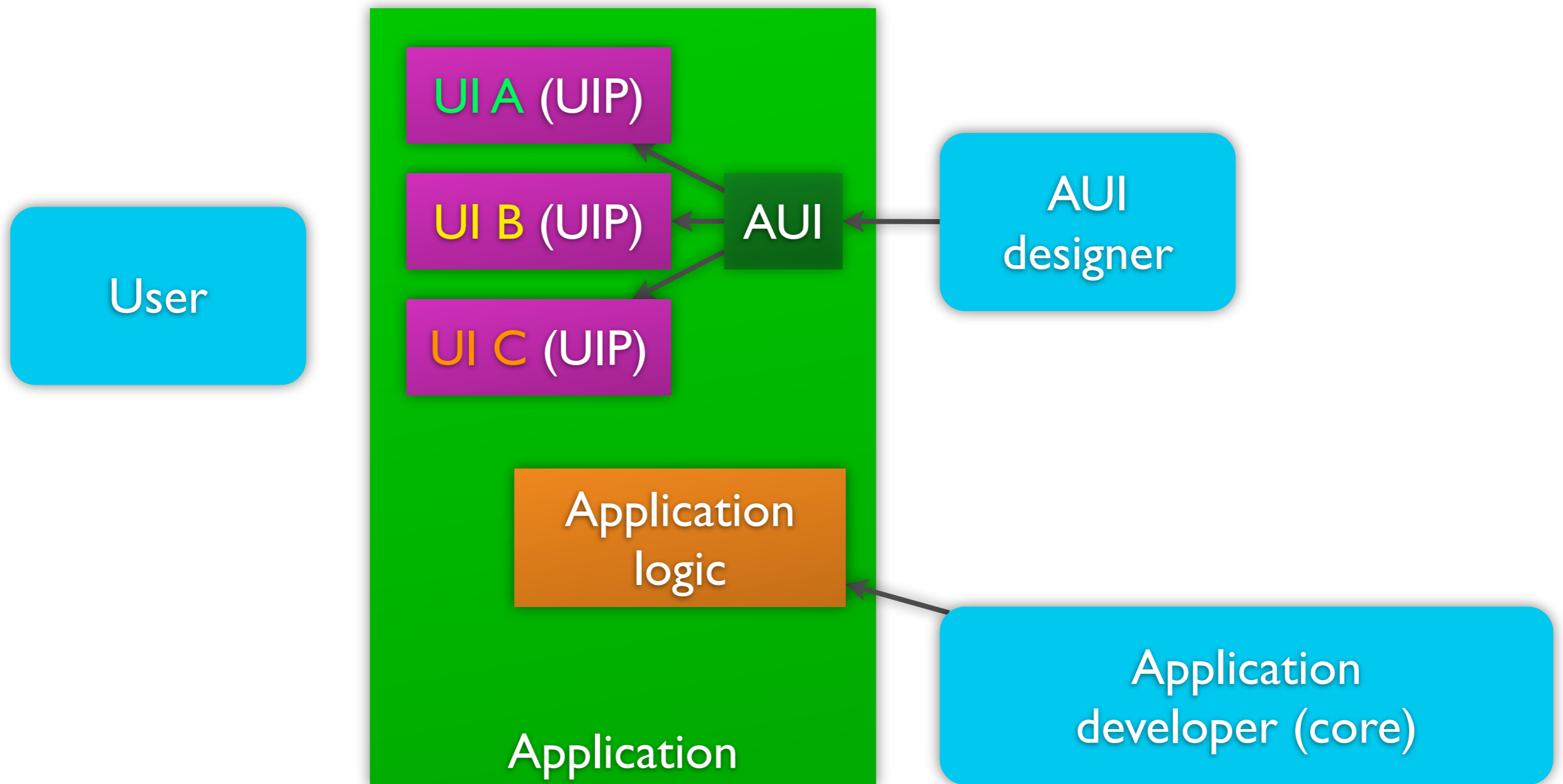
# MOTIVATION | MULTI DEVICE - URC



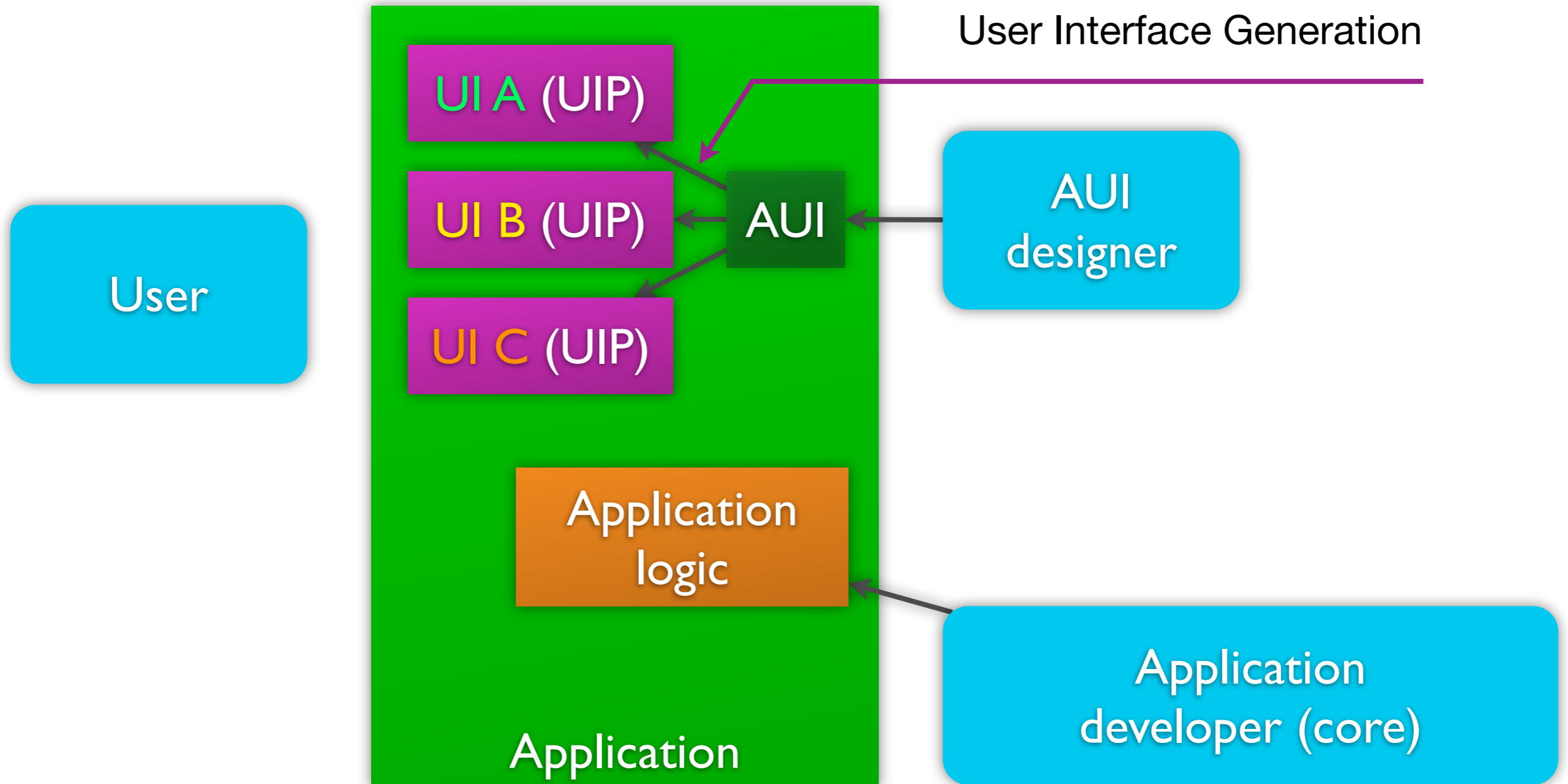
# MOTIVATION | MULTI DEVICE - UIP



# MOTIVATION | UI GENERATION



# MOTIVATION | UI GENERATION



# UIP | USER INTERFACE DELIVERY

- ▶ create single interface, deliver on any platform
- ▶ client-server
- ▶ simple development
- ▶ rich clients
  - animations, media, charts
- ▶ graceful degradation

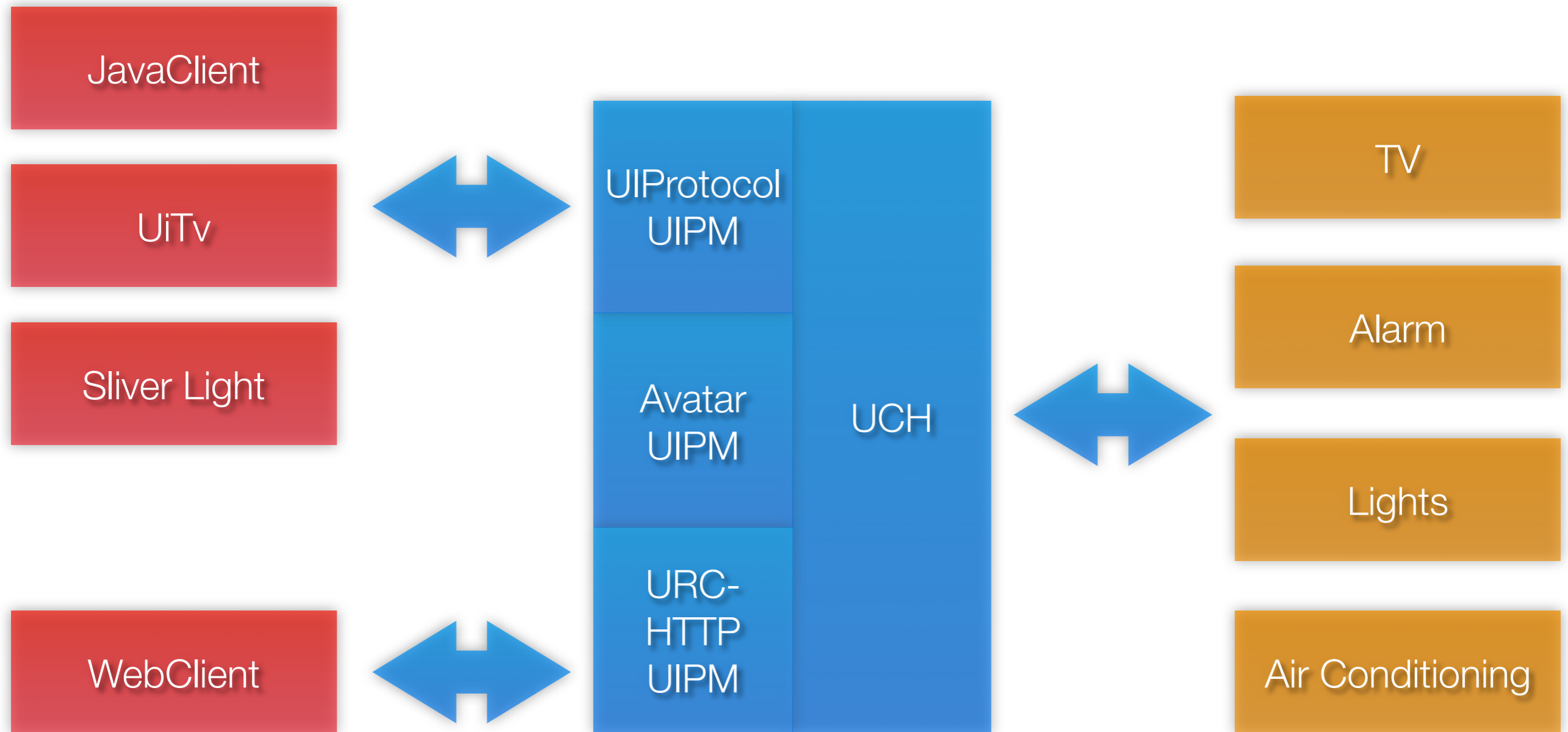


# APPLICATION | i2home

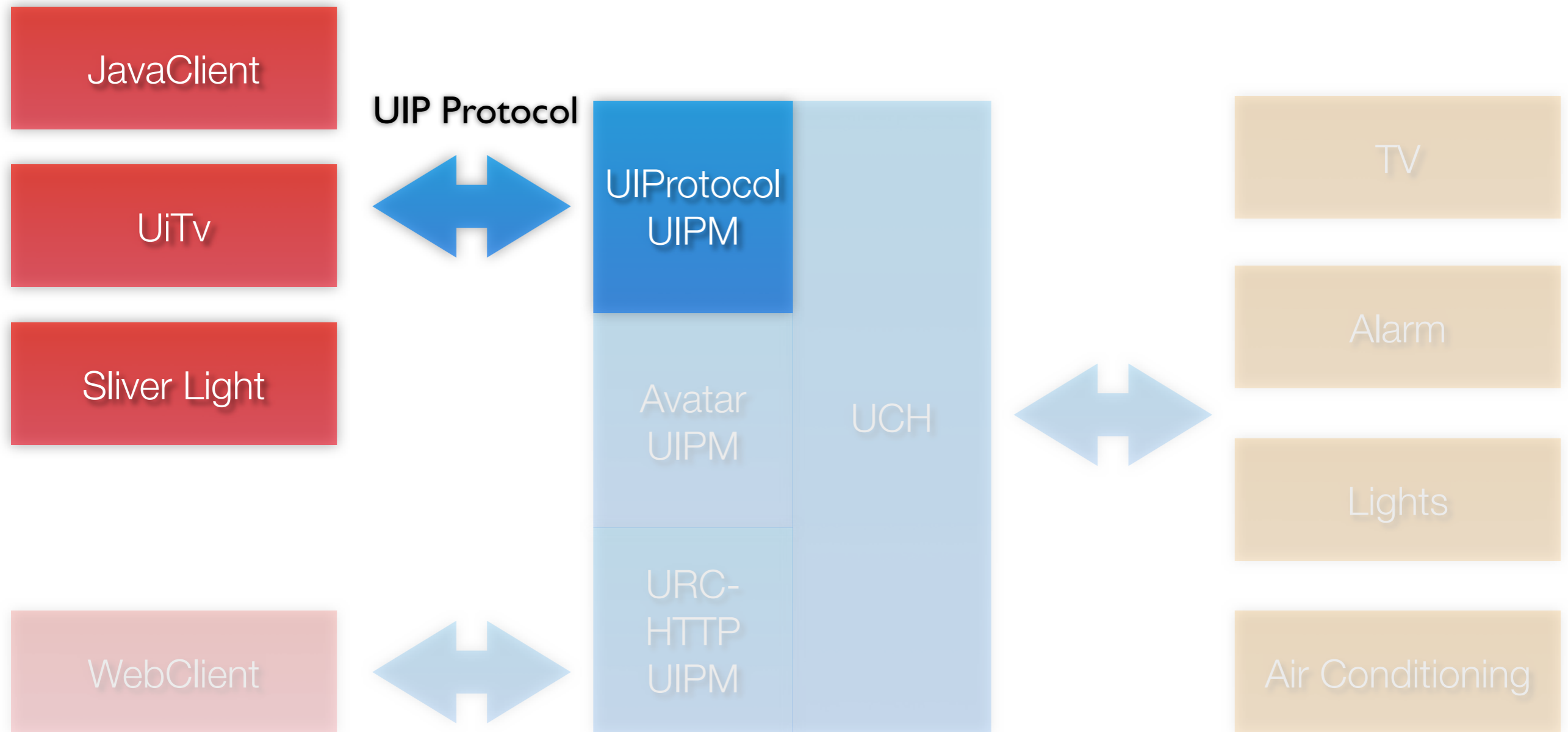
- ▶ FP6, EU Project, 9 partners, 3 years
- ▶ intuitive intelligent household for people with disabilities
- ▶ based on UCH
- ▶ UIP developed as a side effects
- ▶ **User Centred Design**
- ▶ target groups: visually impaired, cognitively impaired, seniors



# i2home | ARCHITECTURE



# i2home | ARCHITECTURE





## User Selection

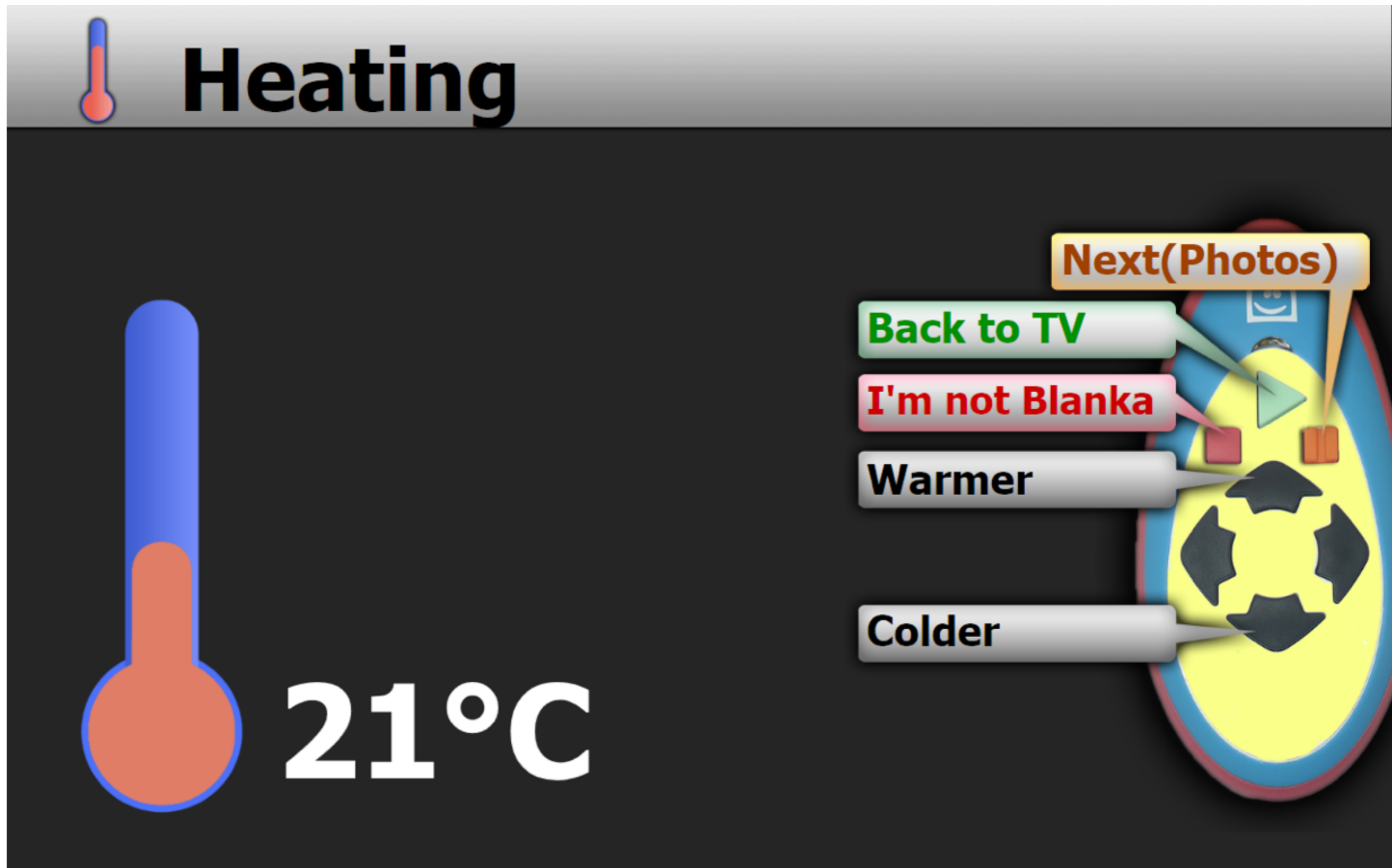


**Back to TV**

**Blanka**

**Arnošt**







# i2home | USER INTERFACES



## Photos



**Next(Lighting)**

**Back to TV**

**I'm not Blanka**

**Next**

**Previous**

## Now you can talk



## Osvětlení

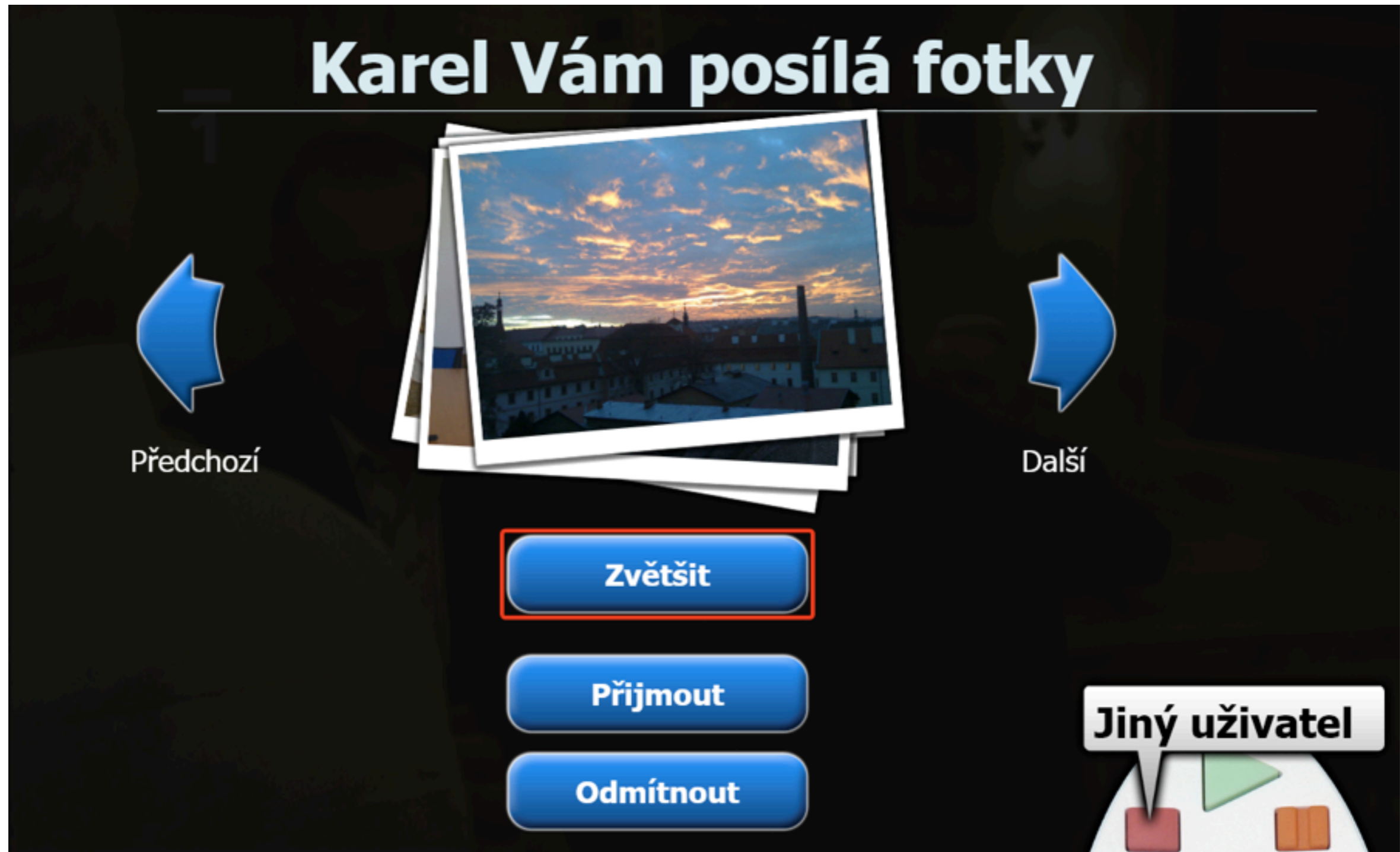
	Vypnuto	Zapnuto
Obývací pokoj		<input checked="" type="checkbox"/>
Ložnice		<input checked="" type="checkbox"/>
Kuchyně		<input checked="" type="checkbox"/>

**Zpět - stav domácnosti**

**Jiný uživatel**







# i2home | USER INTERFACES



Zpět

Změnit uživatele



Vemte si s sebou léky



Otevřená okna



Beru na vědomí

# i2home | USER INTERFACES

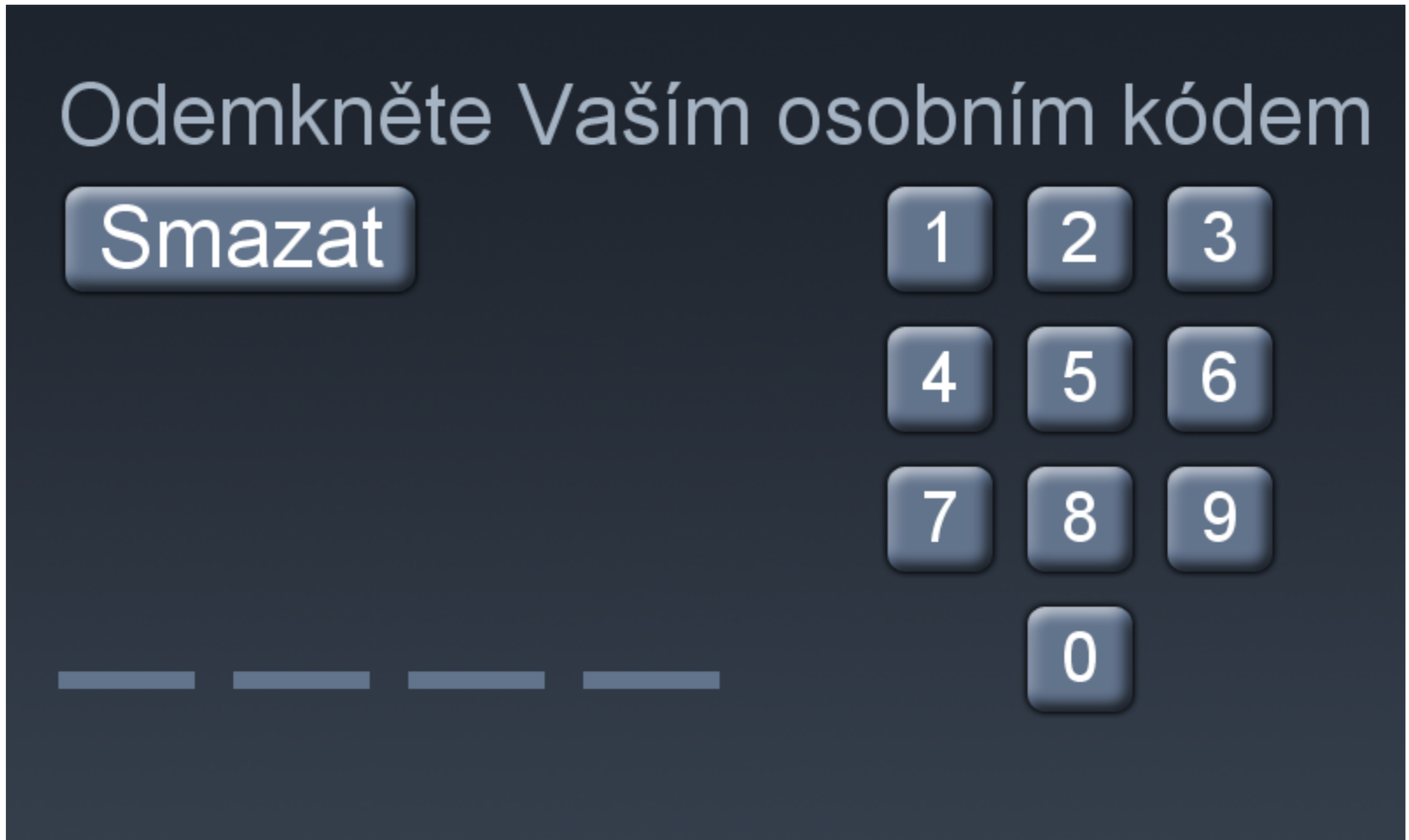


Arnošt



Blanka

# i2home | USER INTERFACES





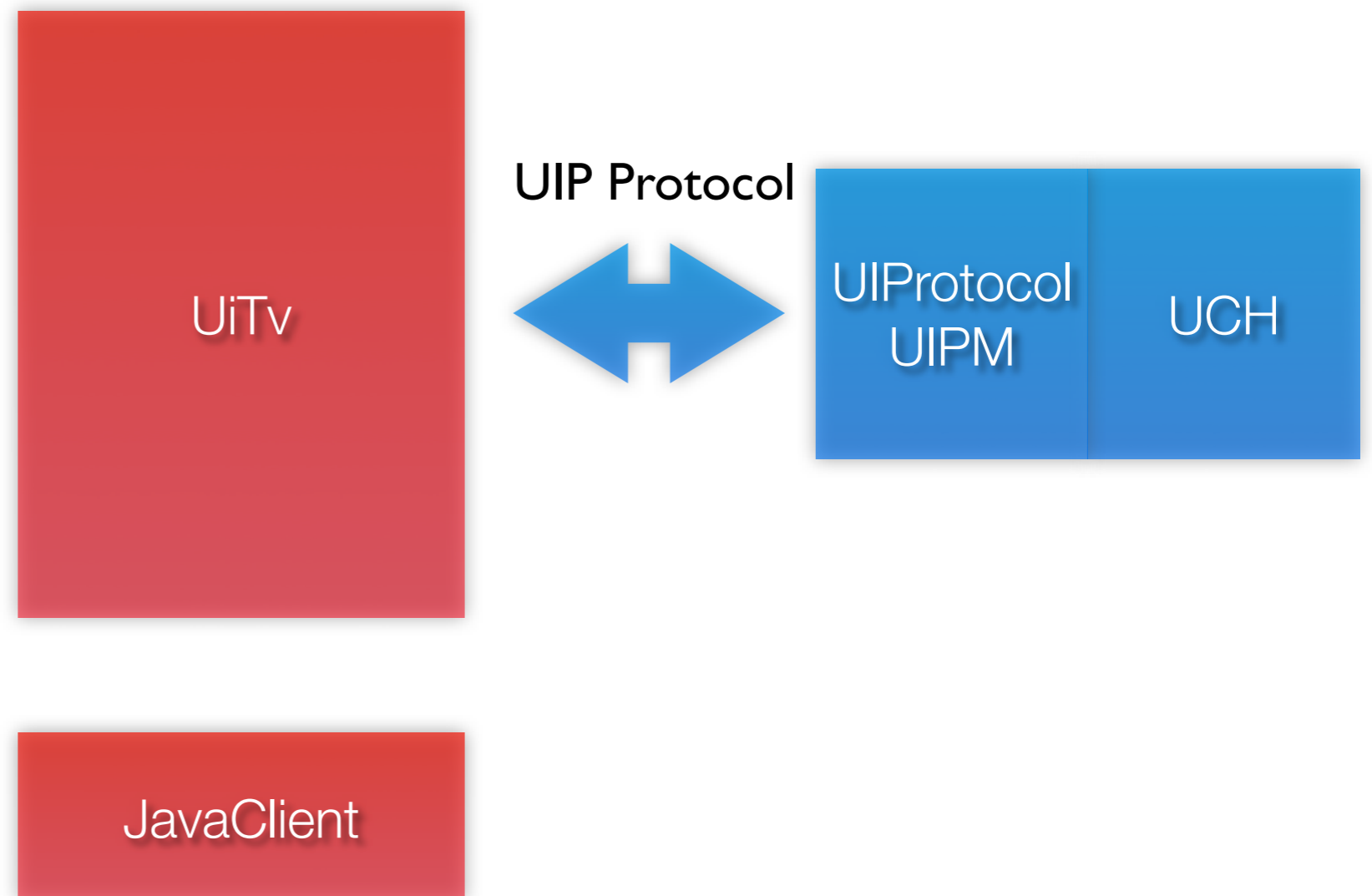
## Vybírejte neznáme obličeje



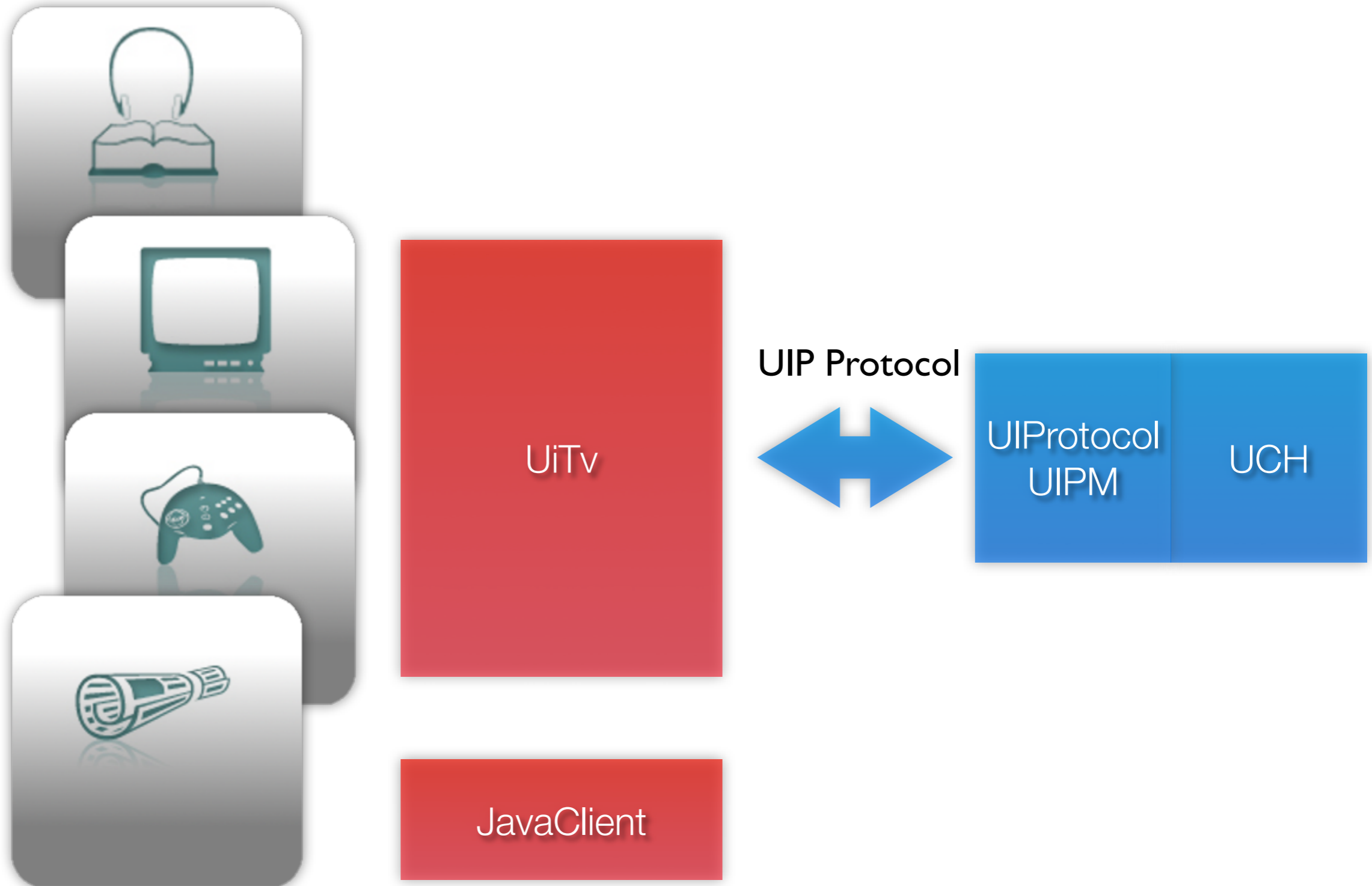
# APPLICATION | VITAL

- ▶ FP6, EU Project, 11 partners, 3(2) years
- ▶ Vital Assistance For The Elderly
- ▶ based on UCH, UIP
- ▶ Smart TV
- ▶ voice integration
- ▶ target group: seniors

# VITAL | ARCHITECTURE



# VITAL | ARCHITECTURE





# VITAL | USER INTERFACES

The screenshot displays a user interface with a blue gradient background. At the top left, a television icon is enclosed in a red rectangular border, with the text "TV" centered below it. To its right are four icons: a clapperboard and camera for "Broadcast News", a globe for "Information Service", and headphones for "Audio Books". Below the "TV" icon is a newspaper icon for "Personal newspaper". To its right are three icons: a game box for "Games", a graduate for "Education", and a video camera for "Video Conference". At the bottom left is a speech bubble with a UK flag. At the bottom center is a green button with a microphone icon and the text "Press play to open mic.". At the bottom right is the "Vital" logo.

# VITAL | USER INTERFACES

## Audio Books

The interface features a blue gradient background with several navigation buttons: 'Book Title' (highlighted with a red border), 'Author' (with an inkwell icon), 'Genre' (with a printer icon), 'Bookmarks' (with a book icon), 'What's New' (with a 'NEW' starburst icon), and 'Top 50' (with a book icon and an upward arrow). A large white rectangular area on the right contains the text: 'Returns a list of available audio books in order of the book title.'

Book Title

Author

Genre

Bookmarks

What's New

Top 50

Returns a list of available audio books in order of the book title.

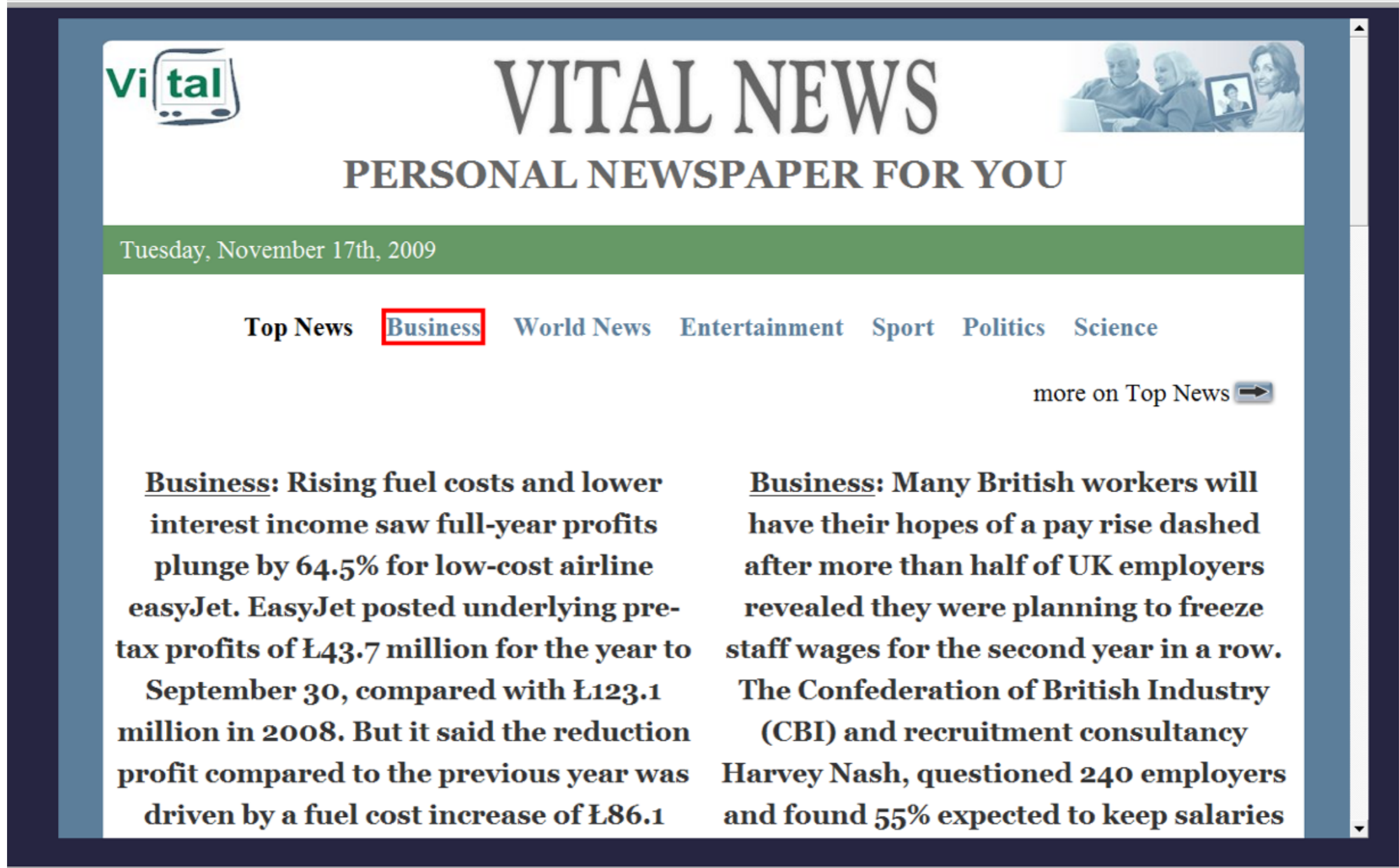


# VITAL | USER INTERFACES

The image shows a digital chess board interface. The board is an 8x8 grid with columns labeled 'a' through 'h' and rows labeled '1' through '8'. The top row (rank 8) contains black pieces: Rook on a8, Knight on b8, Bishop on c8, Queen on d8, King on e8, Bishop on f8, Knight on g8, and Rook on h8. The bottom row (rank 1) contains white pieces: Rook on a1, Knight on b1, Bishop on c1, Queen on d1, King on e1, Bishop on f1, Knight on g1, and Rook on h1. The second rank (rank 7) contains black pawns on a7 through h7, with the pawn on a7 highlighted by a red square. The seventh rank (rank 2) contains white pawns on a2 through h2. Below the board, the text "Offline - Please take turns." is displayed. To the right of the board is a blue menu overlay with the following options: "Offline", a white rectangular input field with dashed lines, "Reject Move", "Short Castling", "Long Castling", "Exit", and "Suspend". The Vital logo is in the bottom right corner of the interface.



# VITAL | USER INTERFACES



The screenshot shows the Vital News website interface. At the top left is the Vital logo, which consists of the word "Vital" in a stylized font with a computer monitor icon. To the right of the logo is the main title "VITAL NEWS" in large, bold, serif capital letters, followed by the subtitle "PERSONAL NEWSPAPER FOR YOU" in smaller, bold, sans-serif capital letters. In the top right corner, there is a small photograph of three people (two men and one woman) looking at a laptop. Below the title and subtitle is a green horizontal bar containing the date "Tuesday, November 17th, 2009". Underneath the date is a navigation menu with the following items: "Top News", "Business" (highlighted with a red border), "World News", "Entertainment", "Sport", "Politics", and "Science". To the right of the navigation menu is a link that says "more on Top News" followed by a right-pointing arrow icon. Below the navigation menu are two columns of news articles. The left column has a headline that reads: "**Business:** Rising fuel costs and lower interest income saw full-year profits plunge by 64.5% for low-cost airline easyJet. EasyJet posted underlying pre-tax profits of £43.7 million for the year to September 30, compared with £123.1 million in 2008. But it said the reduction profit compared to the previous year was driven by a fuel cost increase of £86.1". The right column has a headline that reads: "**Business:** Many British workers will have their hopes of a pay rise dashed after more than half of UK employers revealed they were planning to freeze staff wages for the second year in a row. The Confederation of British Industry (CBI) and recruitment consultancy Harvey Nash, questioned 240 employers and found 55% expected to keep salaries".

# CONCLUSION

## ▶ i2home

- URC as a ISO standard
- UIP development

## ▶ VITAL

- Complex user interfaces
- UIP used as framework by other consortium members

## ▶ Open URC Alliance - CTU is a member

# FUTURE WORK

- ▶ Automatic User Interface Generation
  - currently used for e-governance (forms)
- ▶ Integration of URC and Automatic UI generation
- ▶ New target user groups
  - visually impaired

Q & A

UIPROTOCOL.EU

Thank you for your attention.

[macikmir@fel.cvut.cz](mailto:macikmir@fel.cvut.cz)