

Towards autonomic multimodal interactions

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Outline

- Context
- Overall architecture
- Models
- Example

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Context

- Vision: pervasive computing
 - Communicating devices
 - Evolving environment
- Now
 - Heterogeneity: communication clusters
 - Dynamism: rarely handled

Context: input multimodality

- Interacting with computer systems through several devices
- Vision
 - The user freely chooses its input devices
 - Interaction is usable
- Now
 - Heterogeneity: devices are chosen among compatible devices
 - Scalability: interaction is designed for an application with few devices

Main problem

Interactions are not adaptable

Proposition

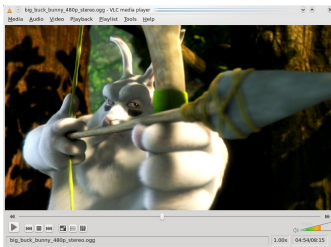
- Autonomic computing can help:
 - Observing environment, analysing, adapting
 - Observing usage, analysing, proposing
 - Taking in account a high level policy given by an user

- Model driven approach can help:
 - Clearly defining what information is needed
 - Abstraction of context

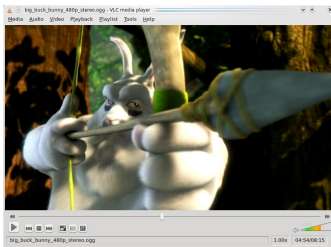
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Overall Architecture



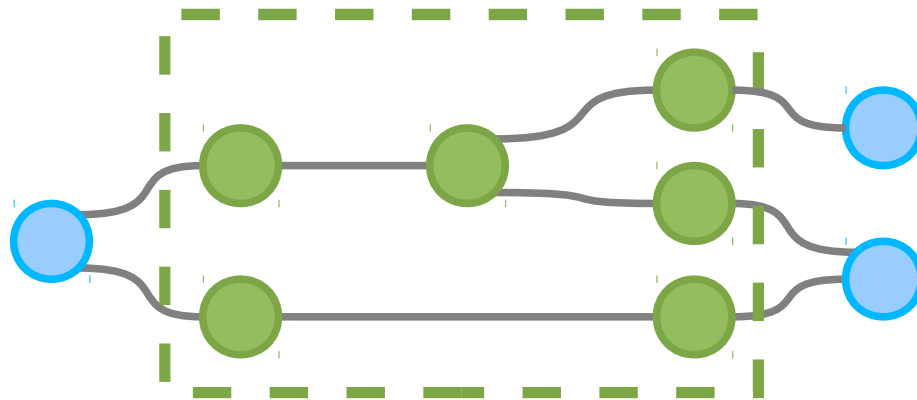
Overall Architecture



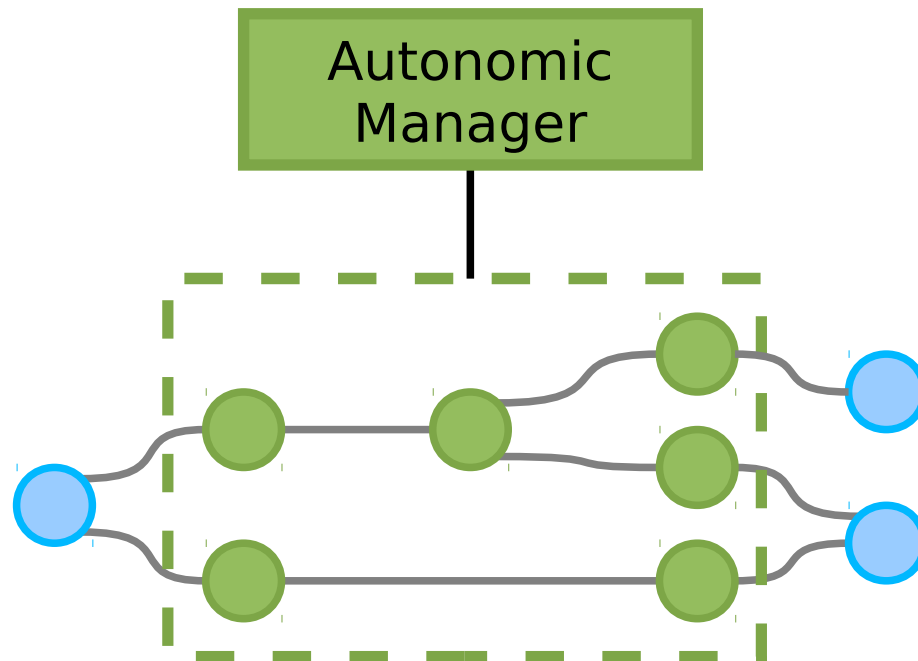
Overall Architecture



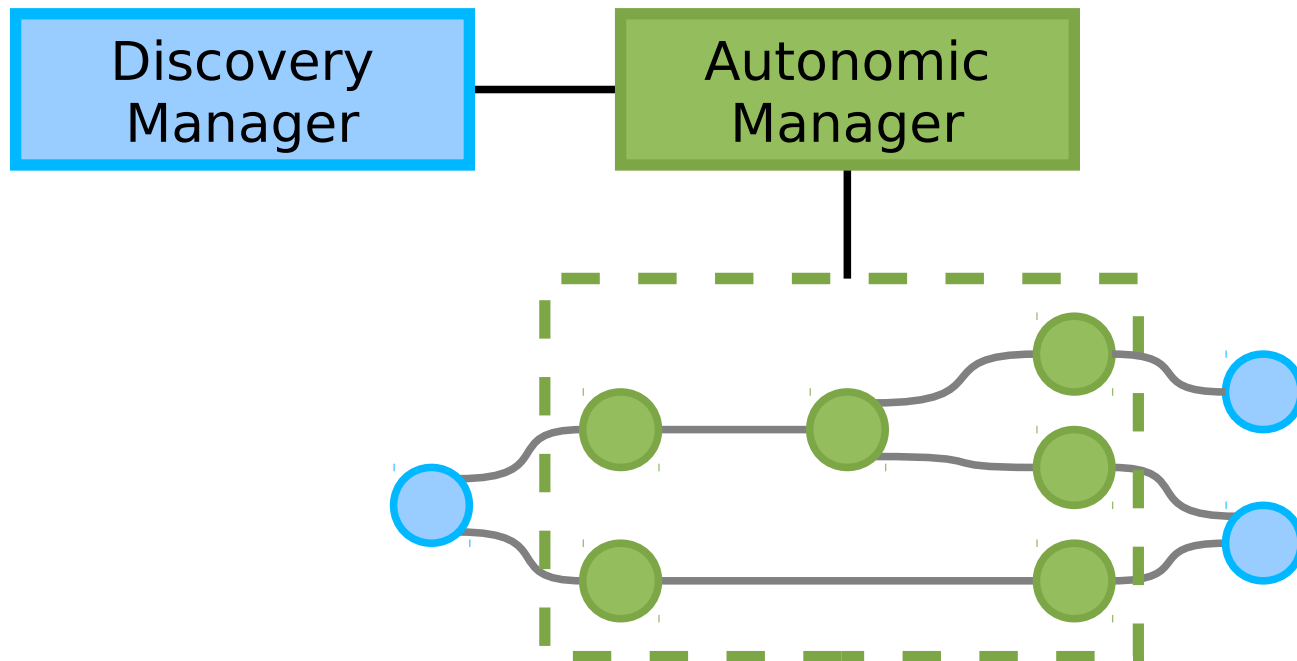
Overall Architecture



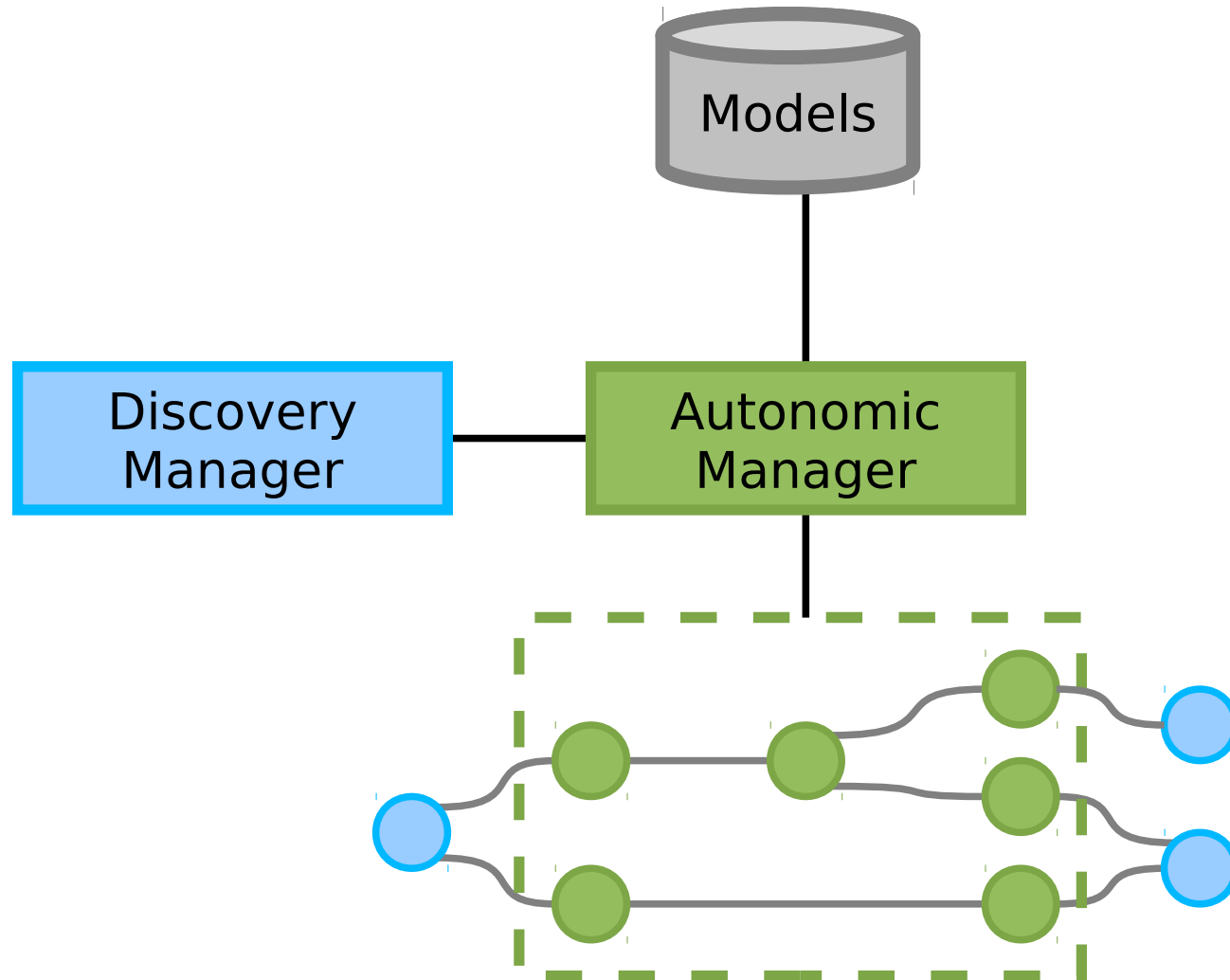
Overall Architecture



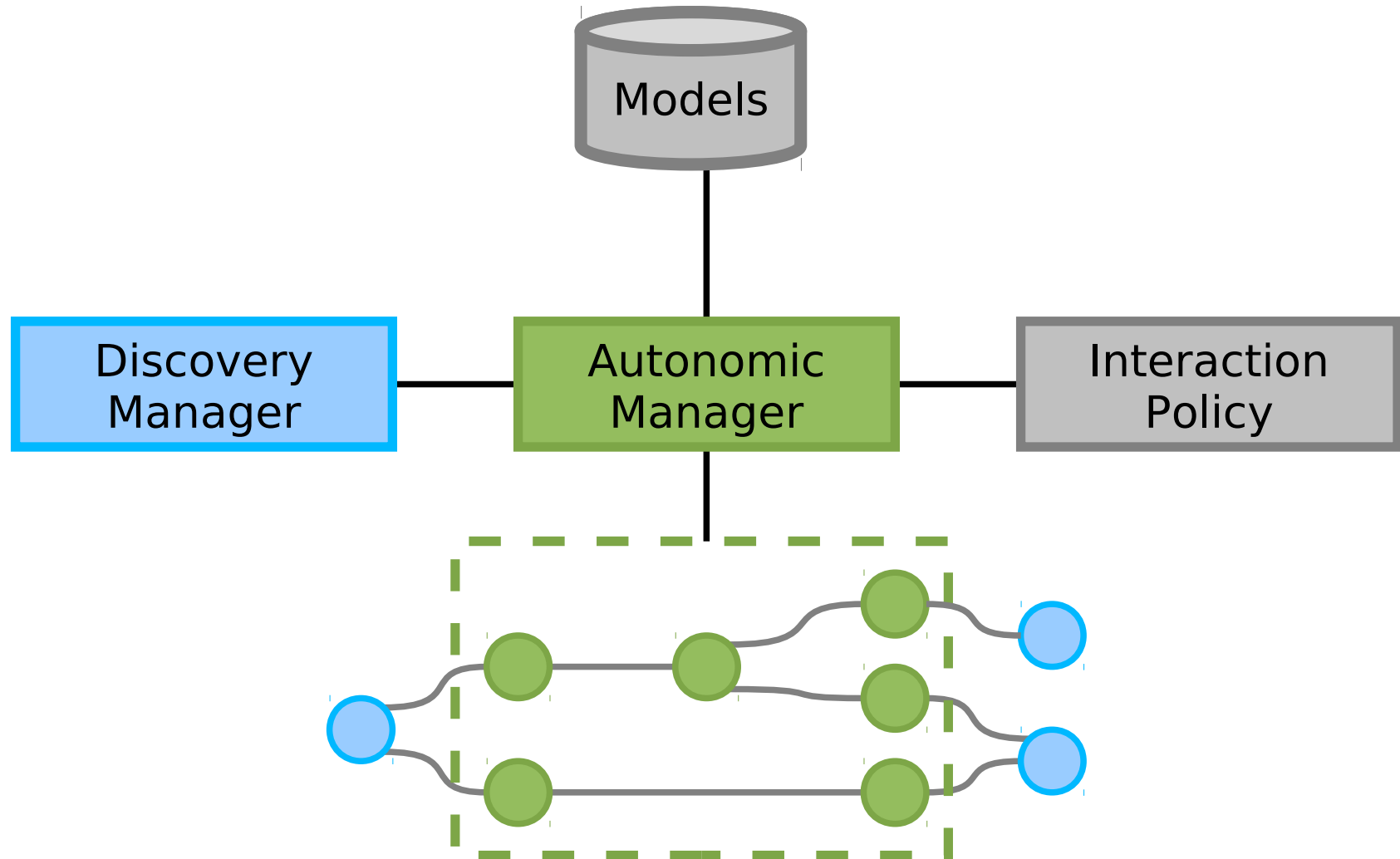
Overall Architecture



Overall Architecture



Overall Architecture



Solved problems

- Heterogeneity: proxy pattern, models
- Dynamism: discovery manager
- Scalability: models

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- **Models**
- Example

Information

- Autonomic manager relies on external information
- Who provides information?
 - At design time
 - Interaction designers
 - Developers
 - At run time
 - User
 - Discovery manager

Proxy models

- Discovery information
- Ports (tasks and sensors)
 - Code reference
 - Data direction
 - Data type
 - Identifier

Partial interaction models

- Objective: enabling the generation of usable interaction
- Mean: letting interaction designers to express their knowledge
 - By assembling components:
 - Declaration
 - Configuration
 - Port connections
 - For an interaction class

Partial interaction models

- Interaction class
- Components
 - Configuration
 - Ports
 - Connections
 - Meanings

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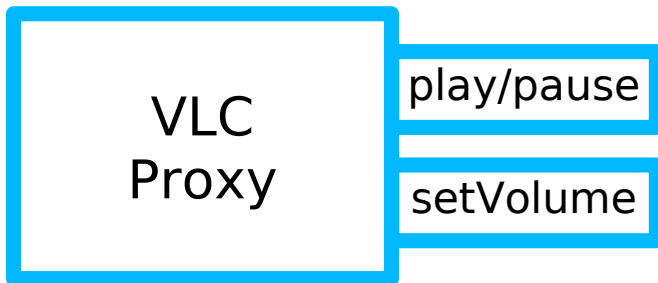
Example: proxy models

- Application
 - VLC
 - Play/pause, SetVolume...
- Devices
 - Wiimote
 - Abutton, Bbutton...
 - BD Remote Control
 - ZeroButton, PauseButton...



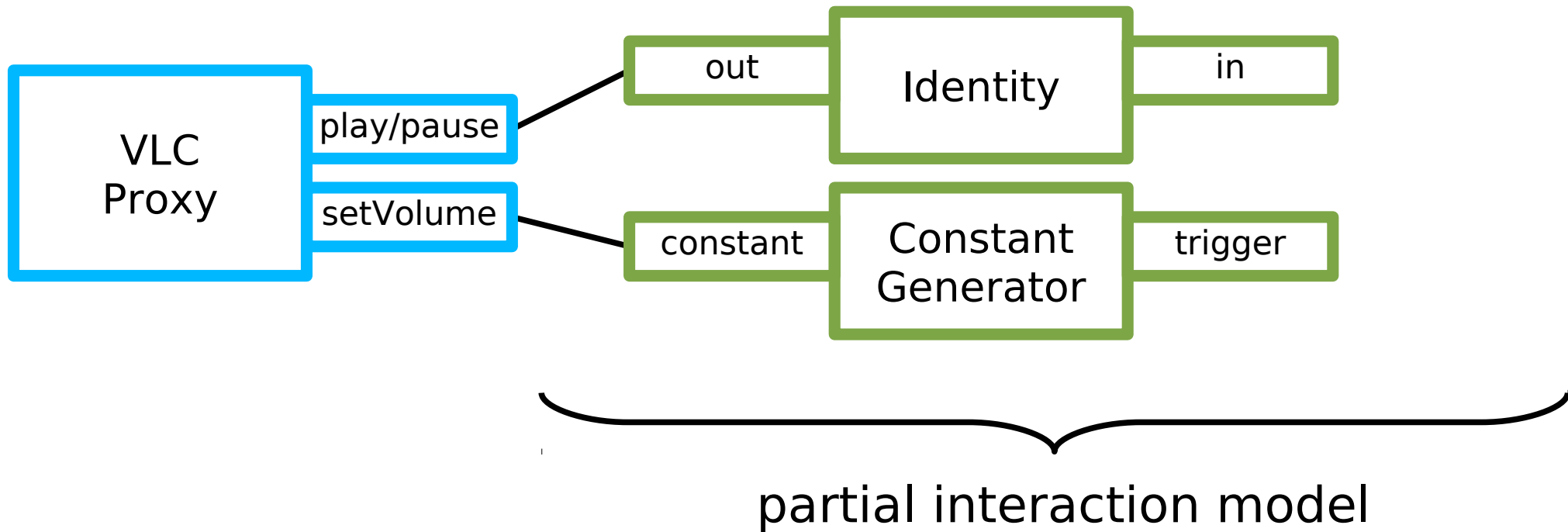
VLC partial interaction model

- "MediaPlayer" interaction class
 - Pause, Mute...



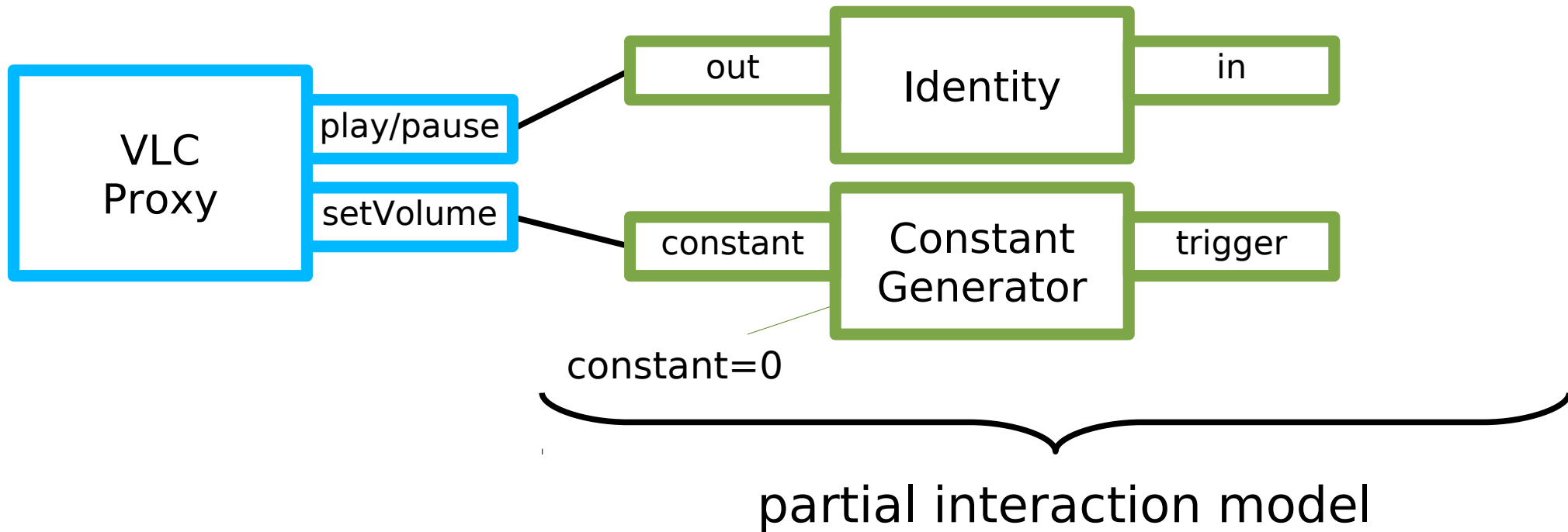
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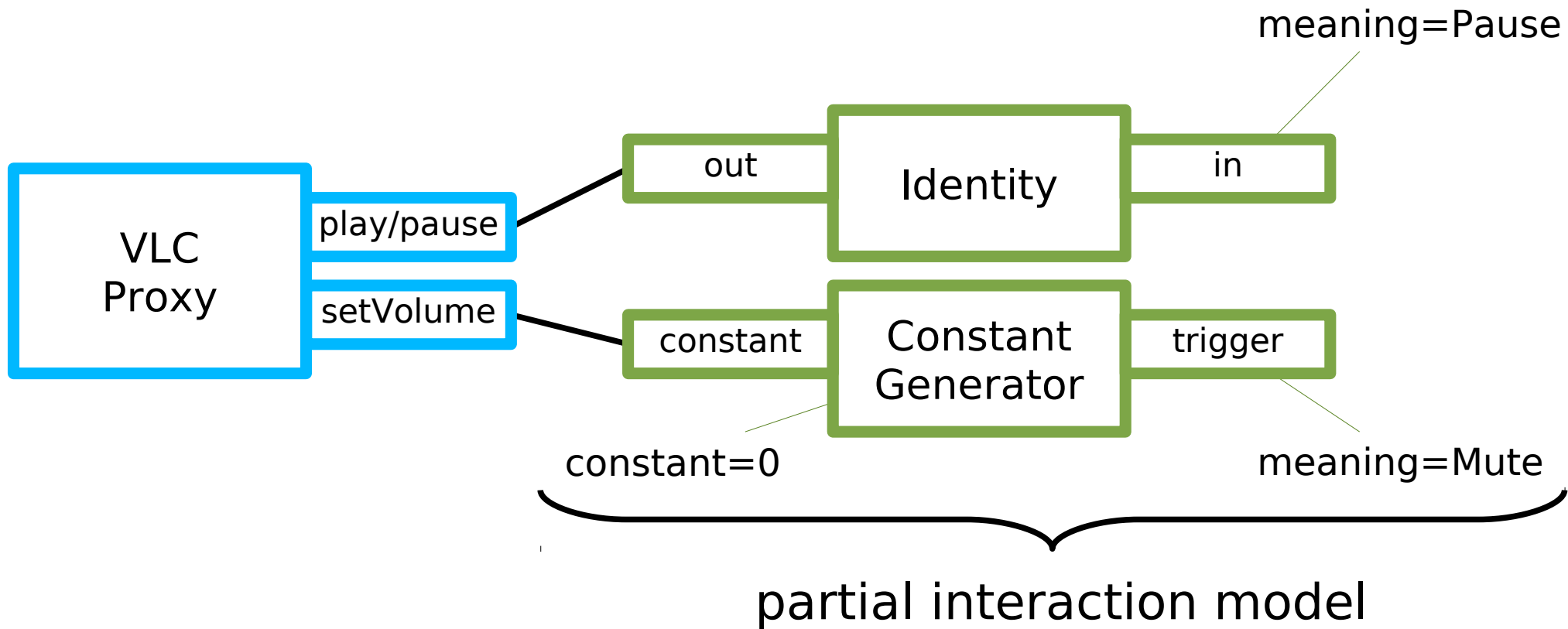
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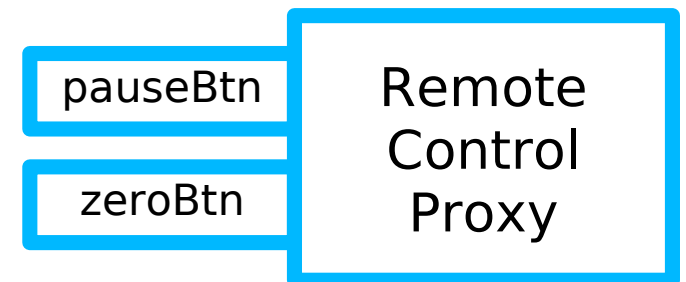
VLC partial interaction model

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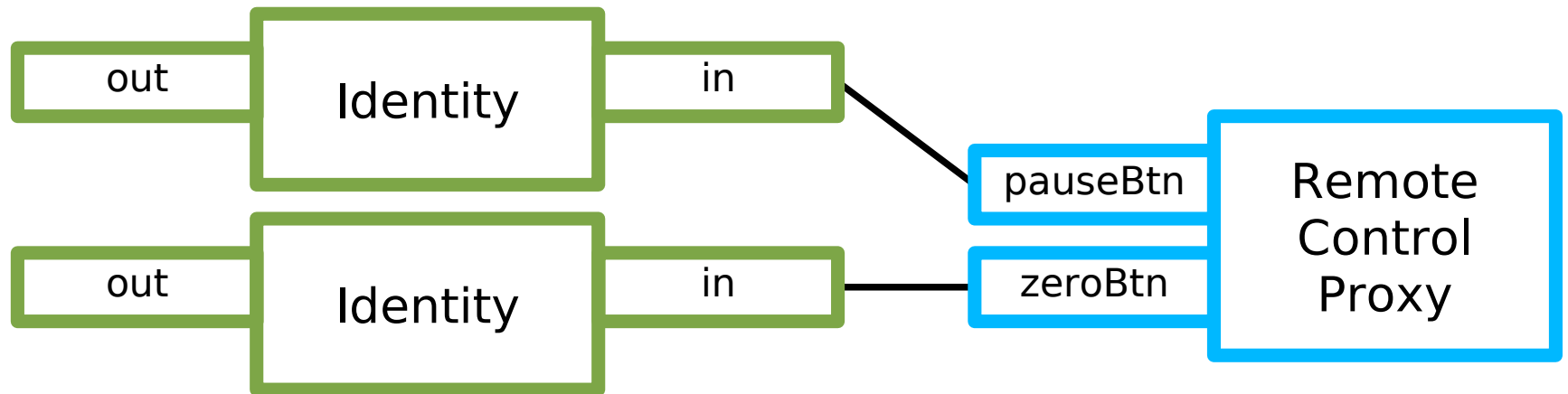
Remote control partial interaction model

- "MediaPlayer" interaction class



Remote control partial interaction model

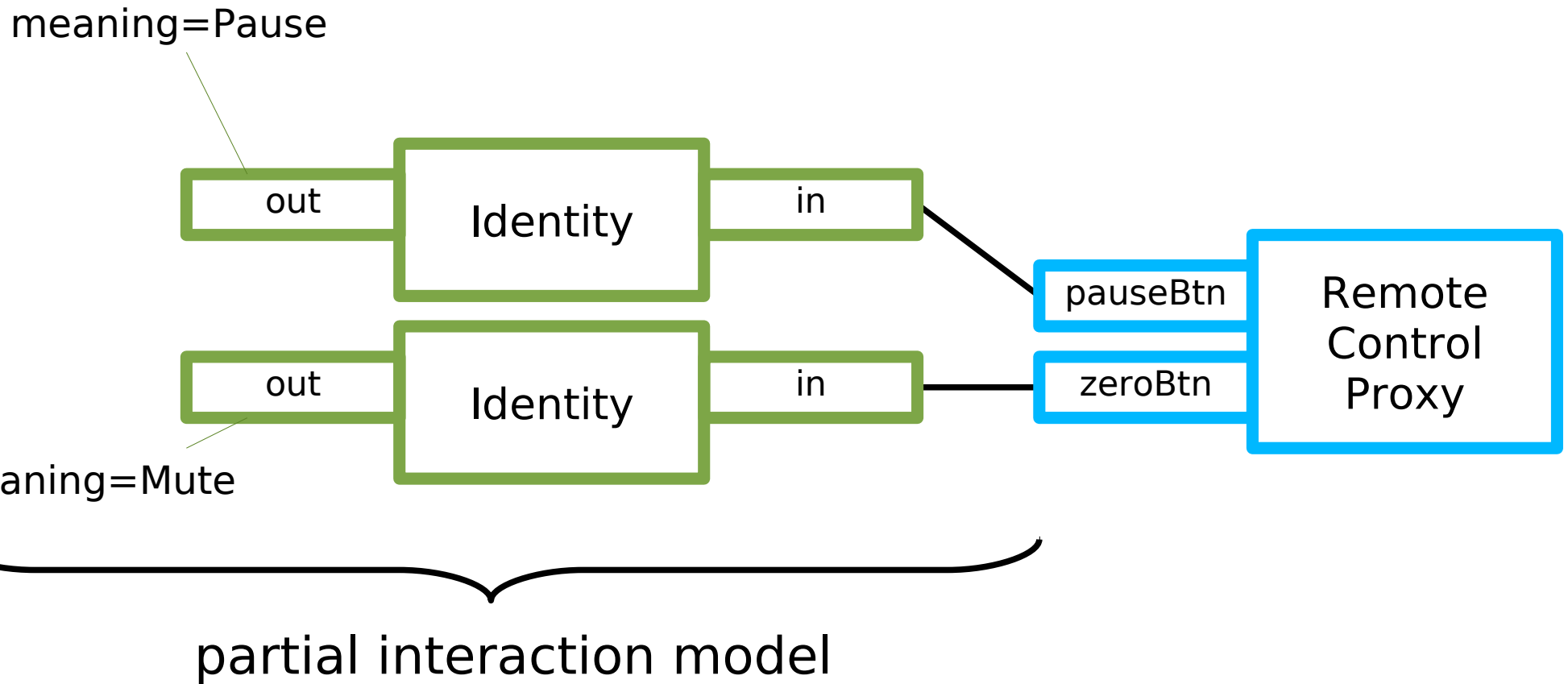
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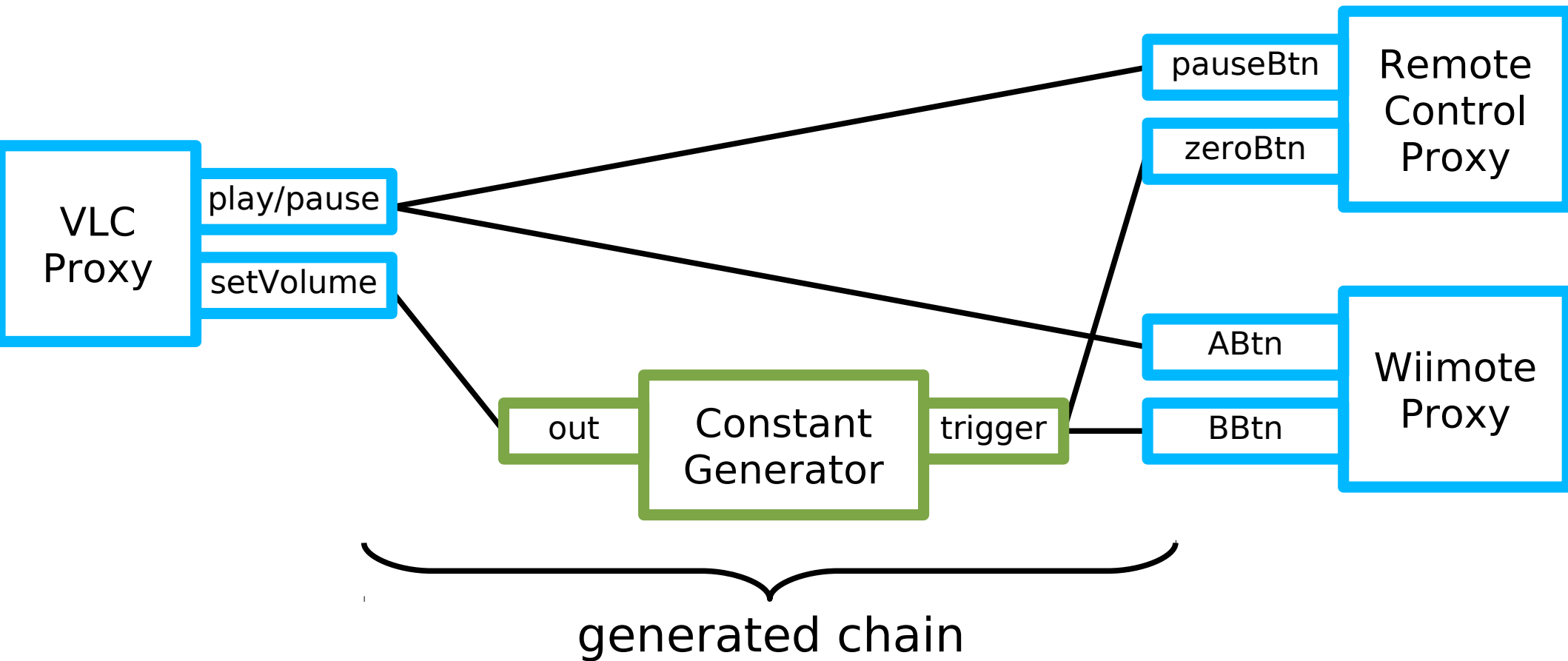
partial interaction model

Remote control partial interaction model

- "MediaPlayer" interaction class



Generated chain



Conclusion

- Pervasive environments => adaptable multimodal interaction
- Autonomic computing and model driven approach enable adaptation
- Our architecture gives a base for future work:
 - Collecting data in mediation chain
 - Analysing
 - Proposing adaptation to users

Questions

