Use of Tcl in the Medusa Multimedia Applications Environment

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High-speed networking
Distributed multimedia
Active Office

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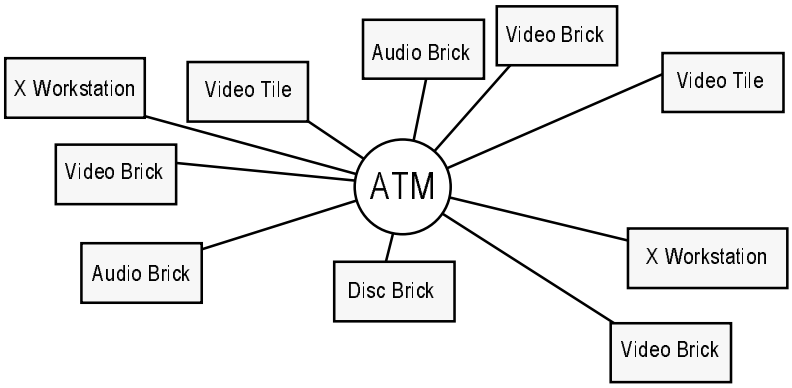
Overview

The Medusa architecture
The integration of Medusa and Tcl
Medusa applications

The vision

Distributed multimedia
Many streams, recipient may choose
Agents may process the data
Exploded workstation: the bus is ATM

ATM Direct Peripherals



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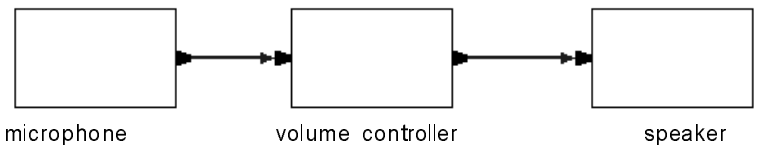
An example

Software “modules” are the units of processing



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Modules and Tcl

Modules are ready-made components;
Tcl glues them together

Modules appear like Tk's widgets

No new modules in Tcl (use C++)

Modules may run on remote machines

Tcl doesn't see data streams

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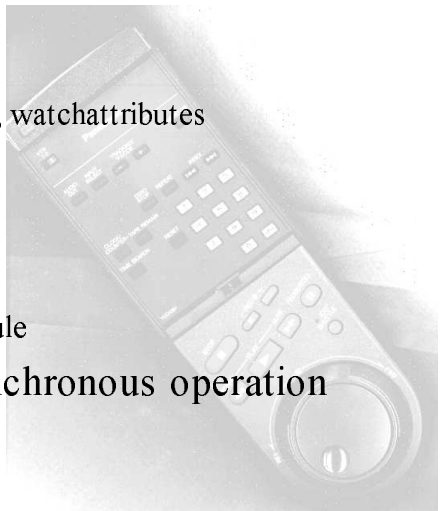
Module methods



Attributes

getattributes, setattributes, watchattributes

Connections

connect, disconnect

Instantiation

createmodule, deletemodule

Synchronous and asynchronous operation

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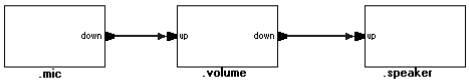
Our example in Tcl




```
NewModule .mic   grouse mgbaudio AudioSourceDevice \
    audio_source
NewModule .volume   nightjar mgbaudio AudioFactory \
    AudioGain
NewModule .speaker   nightjar mgbaudio AudioFactory \
    ATMAudioSink
.mic    connect   down output   .volume up
.volume connect   down output   .speaker up
scale .slider  -from 0  -to 10  -orient horizontal \
    -command {.volume setattributes gain}
pack .slider
```

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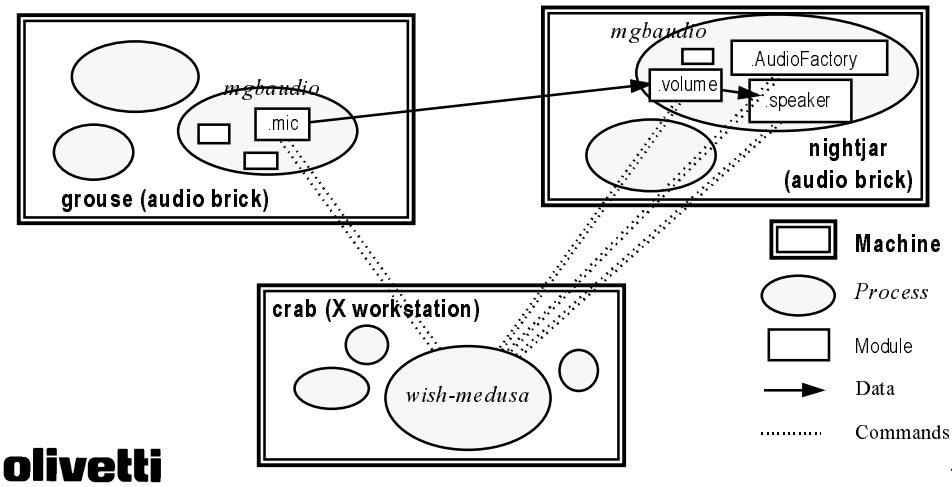
Network transparency



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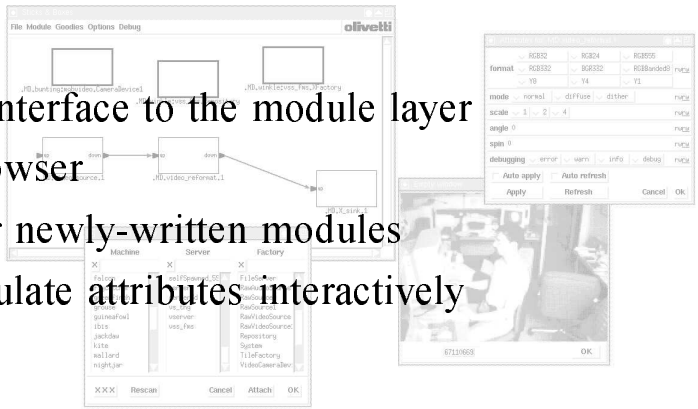
Sticks And Boxes



Graphical interface to the module layer

Factory browser

Testbed for newly-written modules

Can manipulate attributes interactively

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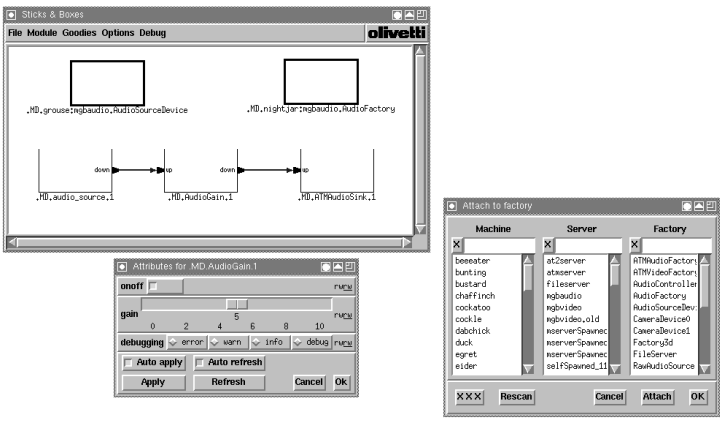
Our example in *Sticks*



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Recycling MDpanel

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MDphone

Multiple streams

Recipient chooses, not sender

Walk-around conversation

Software agents may switch channels

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MDphone

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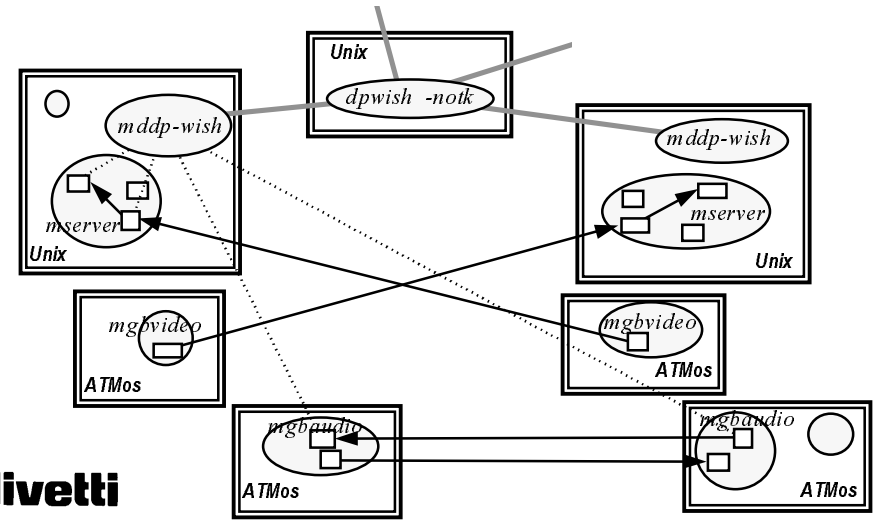
MDphone implementation



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Conclusions

Tcl: good for Medusa

- Flexibility
- High level programming
- Rapid prototyping (e.g. virtual mouse)
- Rapid GUI improvements to match users' requests

Wanted:

- syntax checker
- support for large programs
- Windows NT port

Future Medusa work

Multi-stream mail

Sticks: generate parametric scripts

Image processing agents

Ubiquitous (login-independent) MDphone

Three-dimensional MDphone