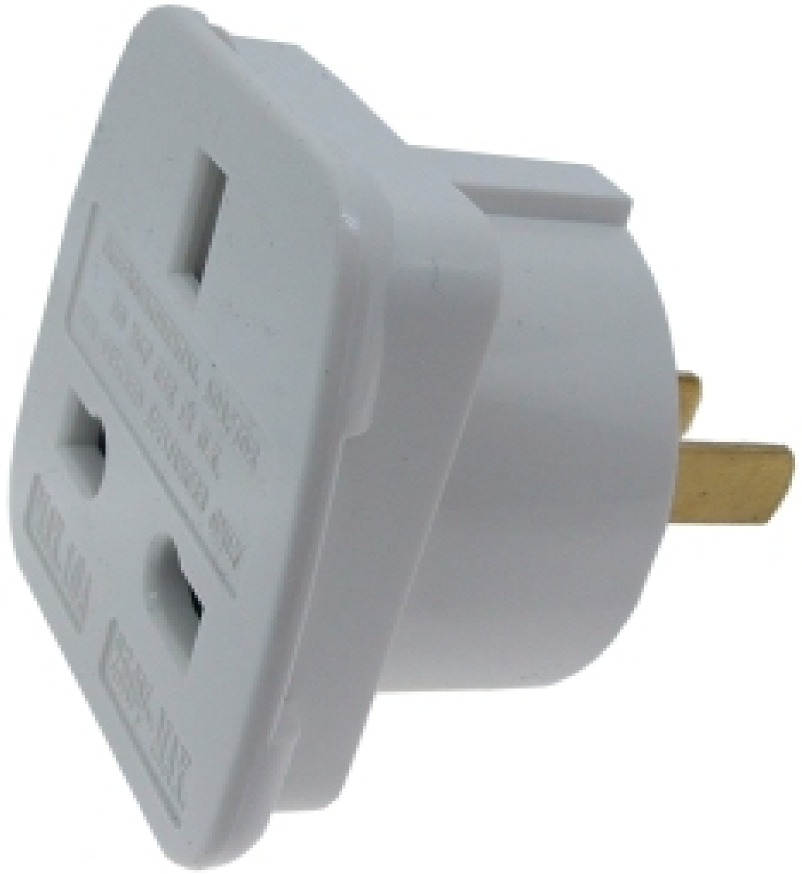
Pattern Examples

Hubert Matthews

Principal Consultant TriReme International Ltd.

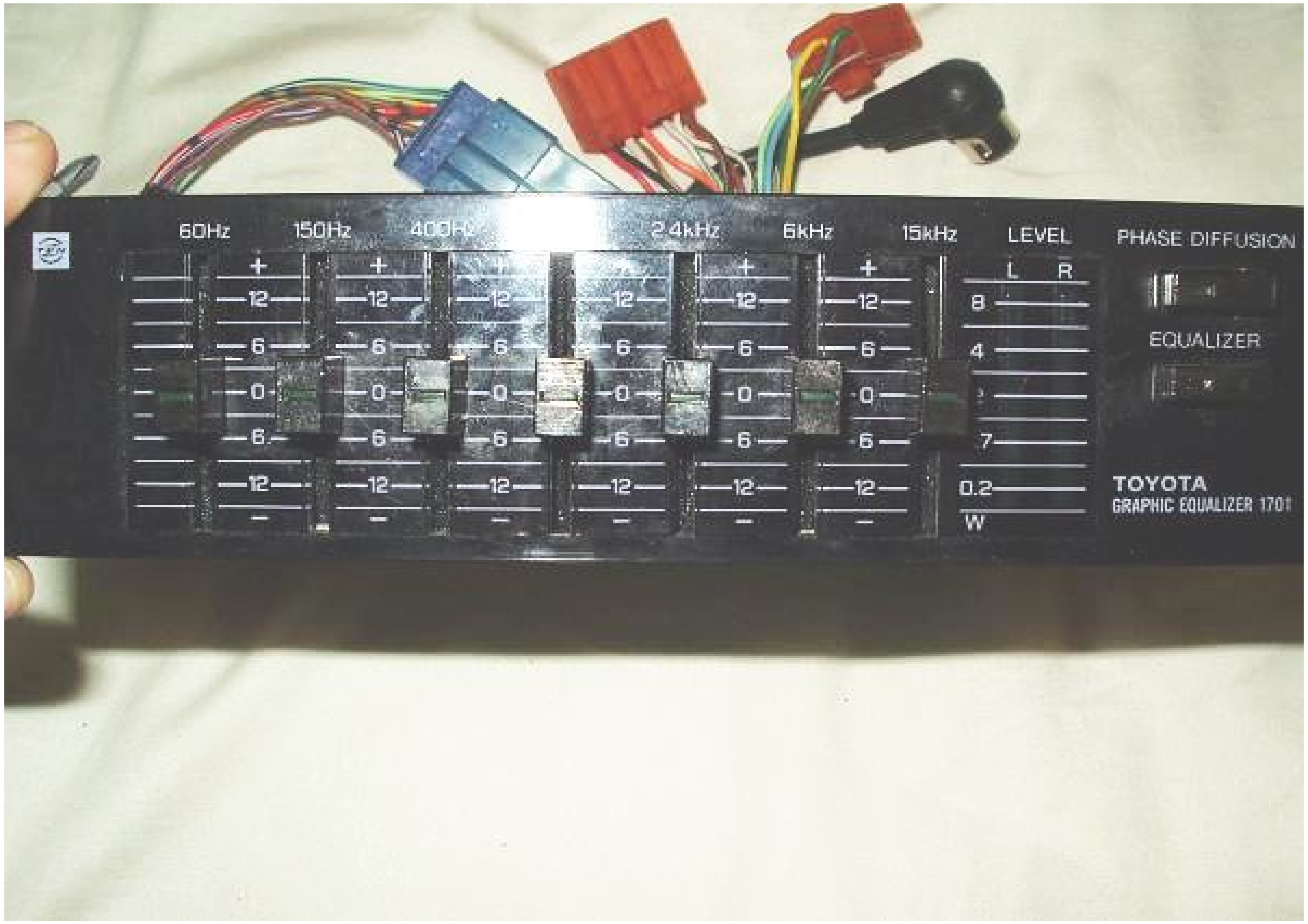
What's this?



Adapter

- Problem context
  - Want to connect systems with different interfaces but similar behaviour
- Forces
  - Can't change either system
- Solution
  - Use an intermediary – an adapter

What's this?


60Hz
150Hz
400Hz
2.4kHz
6kHz
15kHz
LEVEL
L R
PHASE DIFFUSION
EQUALIZER
TOYOTA
GRAPHIC EQUALIZER 1701

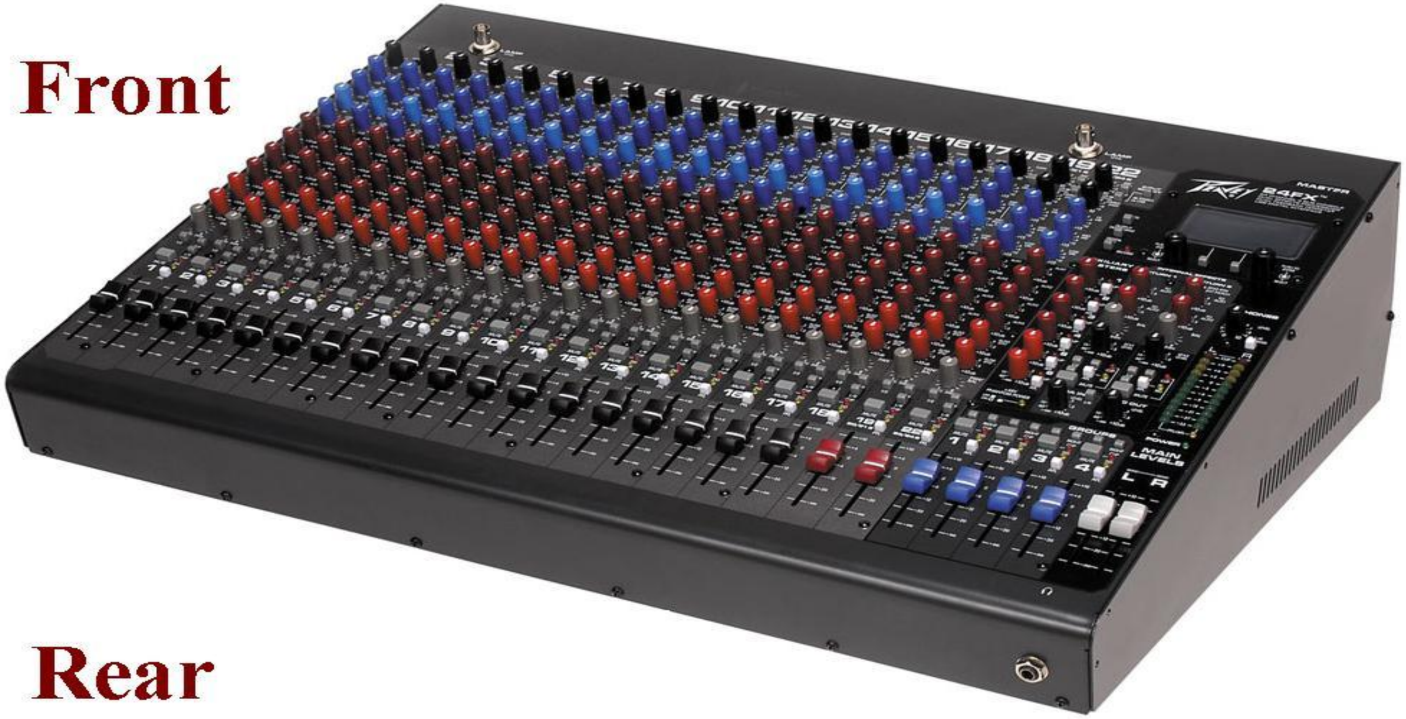
Decorator

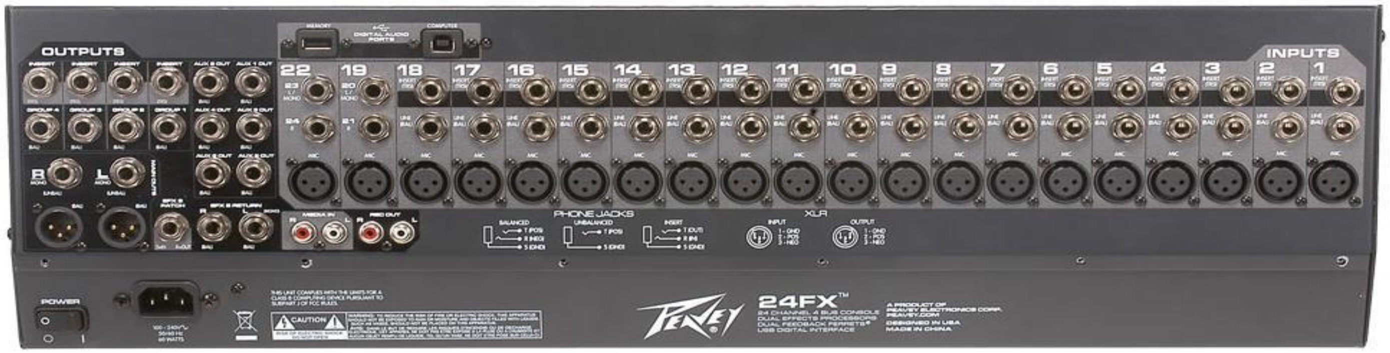
- Problem context
  - Want to change behaviour of system
- Forces
  - Can't change the interface
- Solution
  - Put a new element “inline”

What's this?

Front

Rear

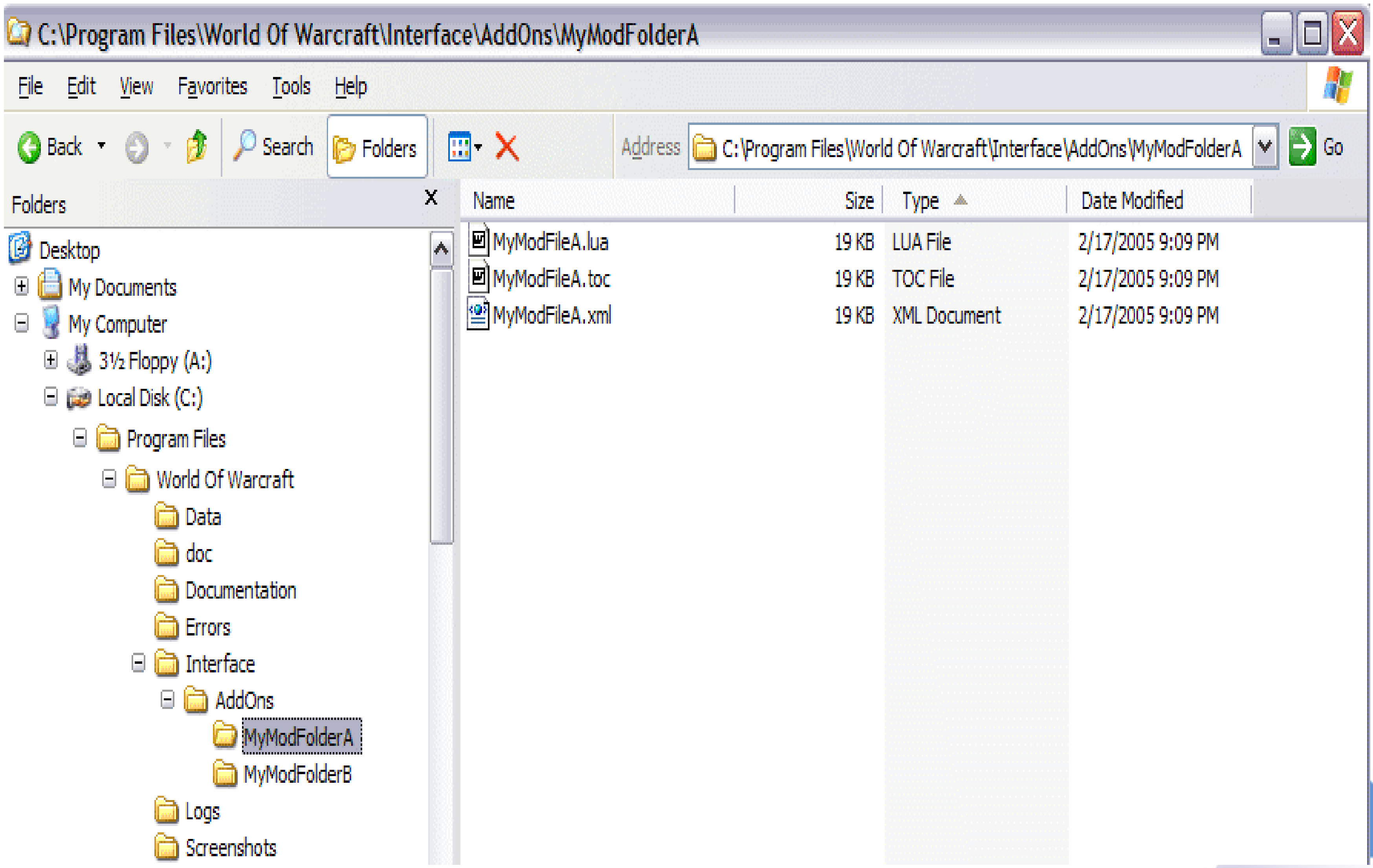




Interceptor

- Problem context
  - Want to be able to alter behaviour, add/remove elements without rewiring
- Forces
  - Can't change the interfaces
- Solution
  - Use a connection system

What's this?



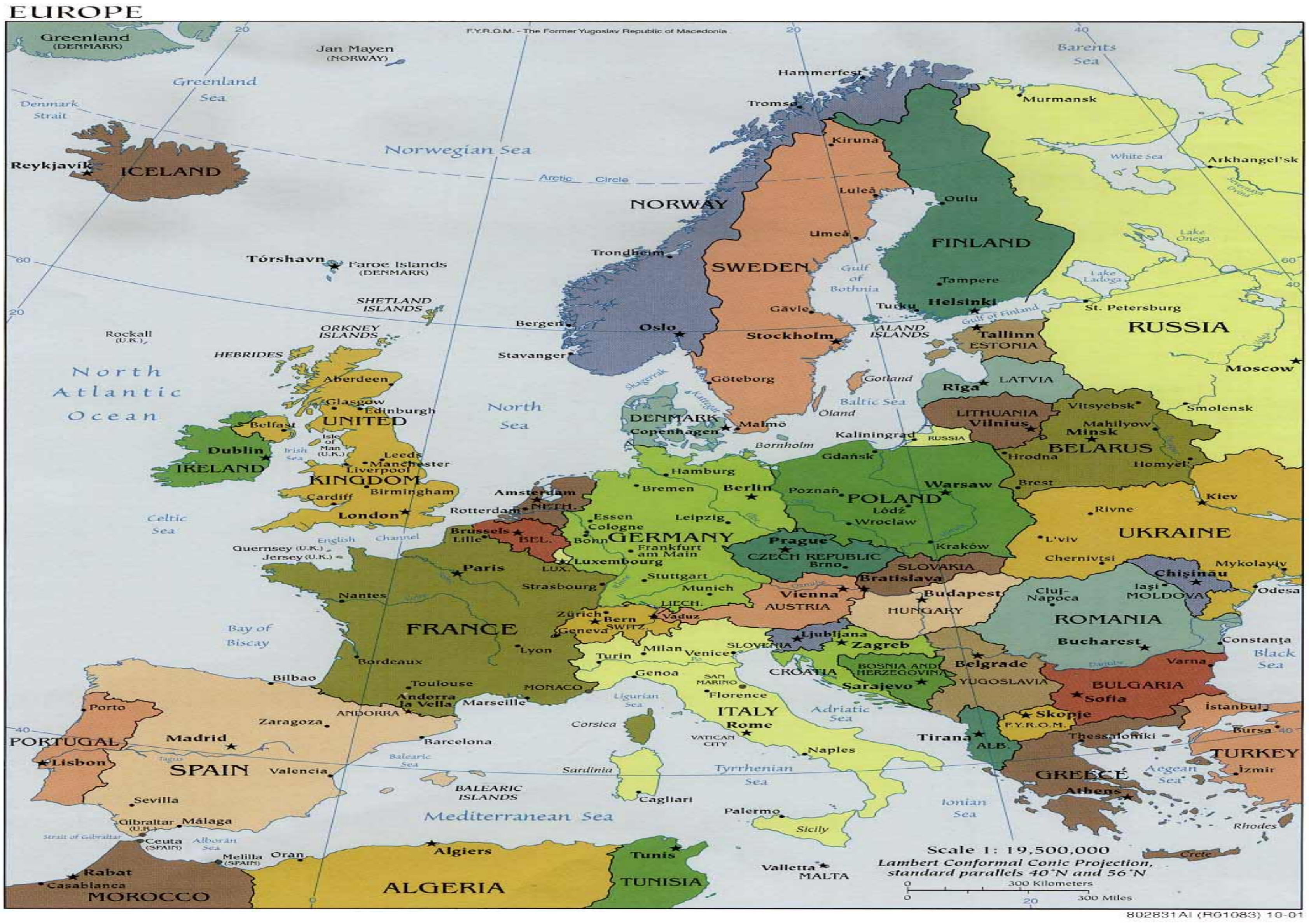
C:\Program Files\World Of Warcraft\Interface\AddOns\MyModFolderA

Name	Size	Type	Date Modified
MyModFileA.lua	19 KB	LUA File	2/17/2005 9:09 PM
MyModFileA.toc	19 KB	TOC File	2/17/2005 9:09 PM
MyModFileA.xml	19 KB	XML Document	2/17/2005 9:09 PM

Composite

- Problem context
  - Want to be able to treat files and directories the same way
- Forces
  - Don't want lots of “if” statements
- Solution
  - Create a composite element that unifies the behaviour of both

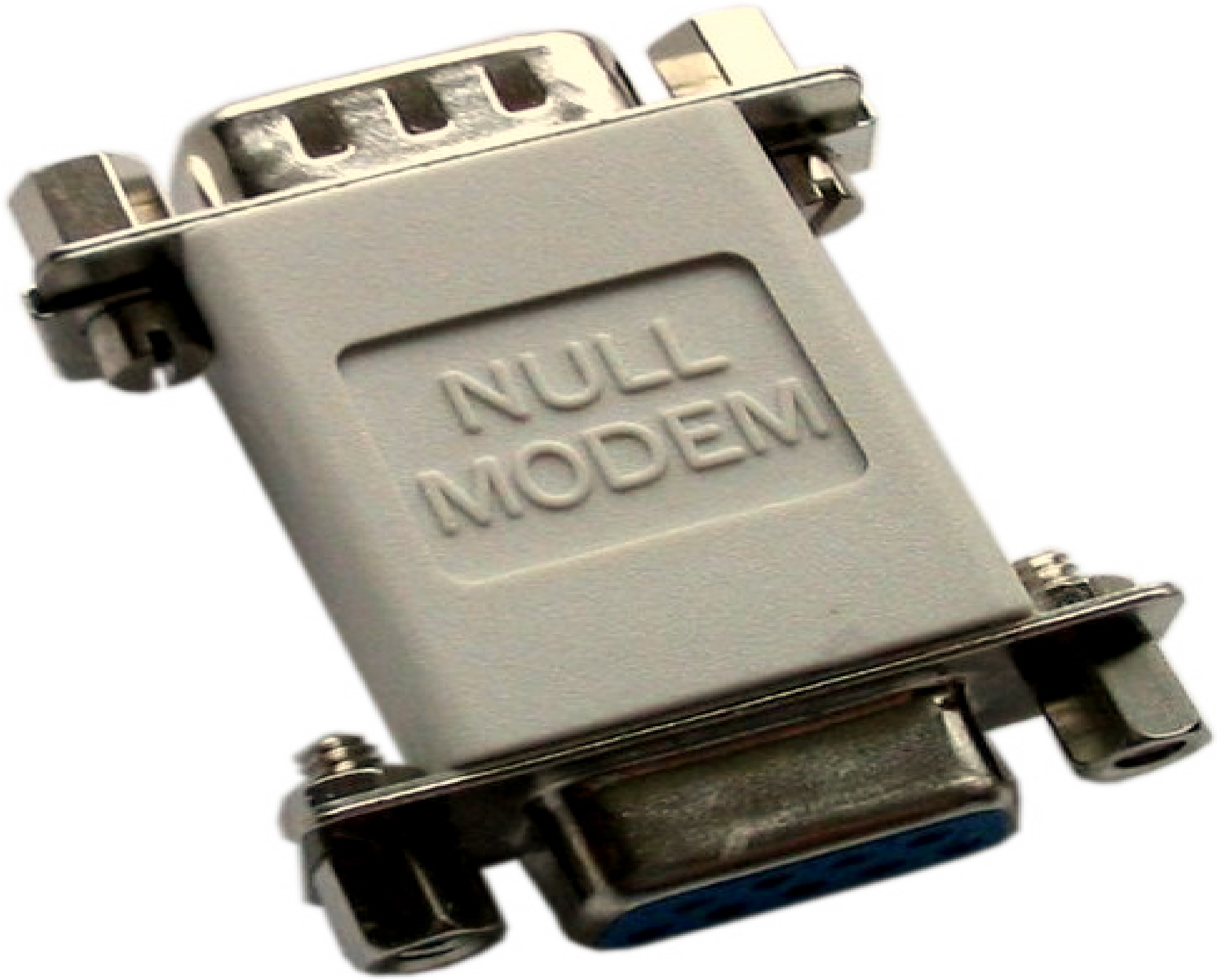
What's this?


EUROPE
F.Y.R.O.M. - The Former Yugoslav Republic of Macedonia
Greenland (DENMARK)
Jan Mayen (NORWAY)
Greenland Sea
Denmark Strait
Barents Sea
Hammerfest
Tromsø
Murmansk
Kiruna
Norwegian Sea
Arctic Circle
Reykjavík
ICELAND
White Sea
Arkhangel'sk
Luleå
Oulu
NORWAY
Umeå
FINLAND
Lake Onega
Trondheim
SWEDEN
Gulf of Bothnia
Tampere
Lake Ladoga
Tórshavn
Faroe Islands (DENMARK)
Turku
Helsinki
Gulf of Finland
St. Petersburg
SHETLAND ISLANDS
Gävle
RUSSIA
Bergen
Oslo
ALAND ISLANDS
Tallinn
ESTONIA
Rockall (U.K.)
ORKNEY ISLANDS
Stockholm
HEBRIDES
Stavanger
Moscow
North Atlantic Ocean
Aberdeen
Skagerrak
Göteborg
Gotland
LATVIA
Riga
North Sea
Kattegat
Baltic Sea
Vitsyebsk
Smolensk
Glasgow
Edinburgh
DENMARK
Öland
LITHUANIA
Vilnius
Belfast
UNITED KINGDOM
Copenhagen
Malmö
Kaliningrad
RUSSIA
Mahilyow
Minsk
Isle of Man (U.K.)
Irish Sea
Bornholm
Hrodna
BELARUS
Dublin
Leeds
Manchester
Liverpool
Gdańsk
Homyel'
IRELAND
Hamburg
Bremen
Berlin
Poznań
Warsaw
Brest
Birmingham
Cardiff
Amsterdam
POLAND
Kiev
London
Rotterdam
NETH.
Łódź
Rivne
Celtic Sea
Essen
Cologne
Leipzig
Wrocław
Brussels
BEL.
Lille
Bonn
GERMANY
Prague
L'viv
UKRAINE
English Channel
Frankfurt am Main
CZECH REPUBLIC
Kraków
Guernsey (U.K.)
Jersey (U.K.)
Luxembourg
LUX.
Brno
Chernivtsi
Paris
Stuttgart
SLOVAKIA
Chişinău
Mykolayiv
Strasbourg
Bratislava
Danube
Nantes
Munich
Vienna
Budapest
Cluj-Napoca
Iaşi
MOLDOVA
Odesa
LIECH.
AUSTRIA
HUNGARY
Bay of Biscay
FRANCE
Zürich
Vaduz
Bern
SWITZ.
ROMANIA
Geneva
Ljubljana
SLOVENIA
Zagreb
Constanţa
Lyon
Milan
Venice
Bucharest
Black Sea
Turin
CROATIA
BOSNIA AND HERZEGOVINA
Belgrade
Varna
Bordeaux
Genoa
SAN MARINO
Sarajevo
YUGOSLAVIA
Bilbao
Toulouse
MONACO
Ligurian Sea
Florence
BULGARIA
Sofia
Andorra la Vella
Marseille
Adriatic Sea
Porto
ANDORRA
ITALY
İstanbul
Zaragoza
Corsica
Rome
Skopje
F.Y.R.O.M.
PORTUGAL
Madrid
VATICAN CITY
Tirana
ALB.
Thessaloniki
Bursa
Barcelona
Naples
TURKEY
Lisbon
SPAIN
Tagus
Valencia
Balearic Sea
Sardinia
Tyrrhenian Sea
GREECE
Aegean Sea
İzmir
BALEARIC ISLANDS
Cagliari
Athens
Sevilla
Ionian Sea
Mediterranean Sea
Palermo
Gibraltar (U.K.)
Málaga
Sicily
Rhodes
Strait of Gibraltar
Ceuta (SPAIN)
Alborán Sea
Algiers
Tunis
Crete
Melilla (SPAIN)
Oran
Rabat
Valletta
MALTA
Scale 1: 19,500,000
Lambert Conformal Conic Projection, standard parallels 40°N and 56°N
300 Kilometers
300 Miles
Casablanca
MOROCCO
ALGERIA
TUNISIA
802831AI (R01083) 10-01

Composite (part 2)

- Problem context
  - Want to be able to treat regions, sub-regions and countries the same way
- Forces
  - Don't want lots of “if” statements
- Solution
  - Create a composite element that unifies the behaviour of both

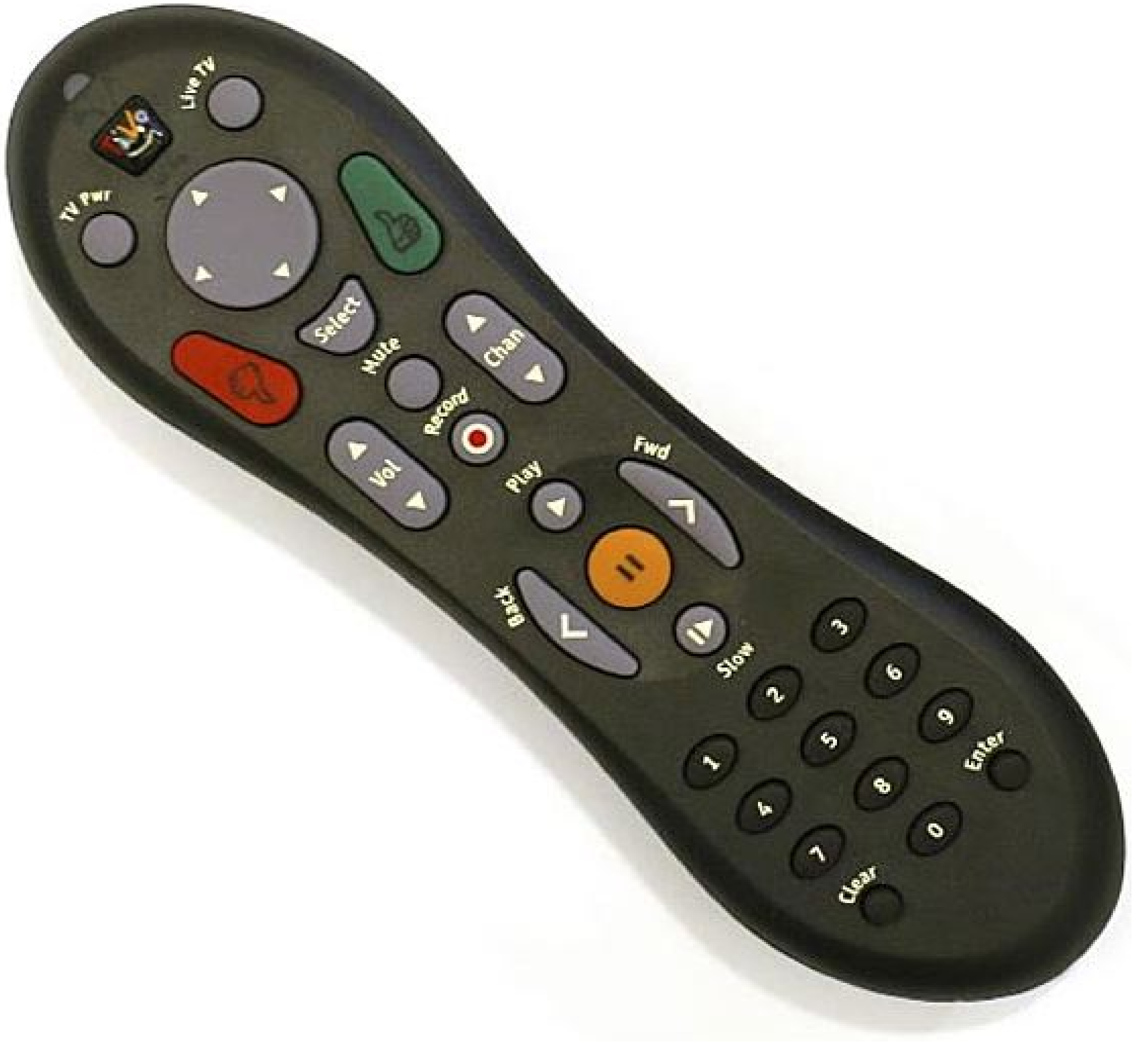
What's this?



Null Object

- Problem context
  - Want to be able to “do nothing” when “something” is required
- Forces
  - Don't want lots of “if” statements
- Solution
  - Create an element that has the same interface but does nothing

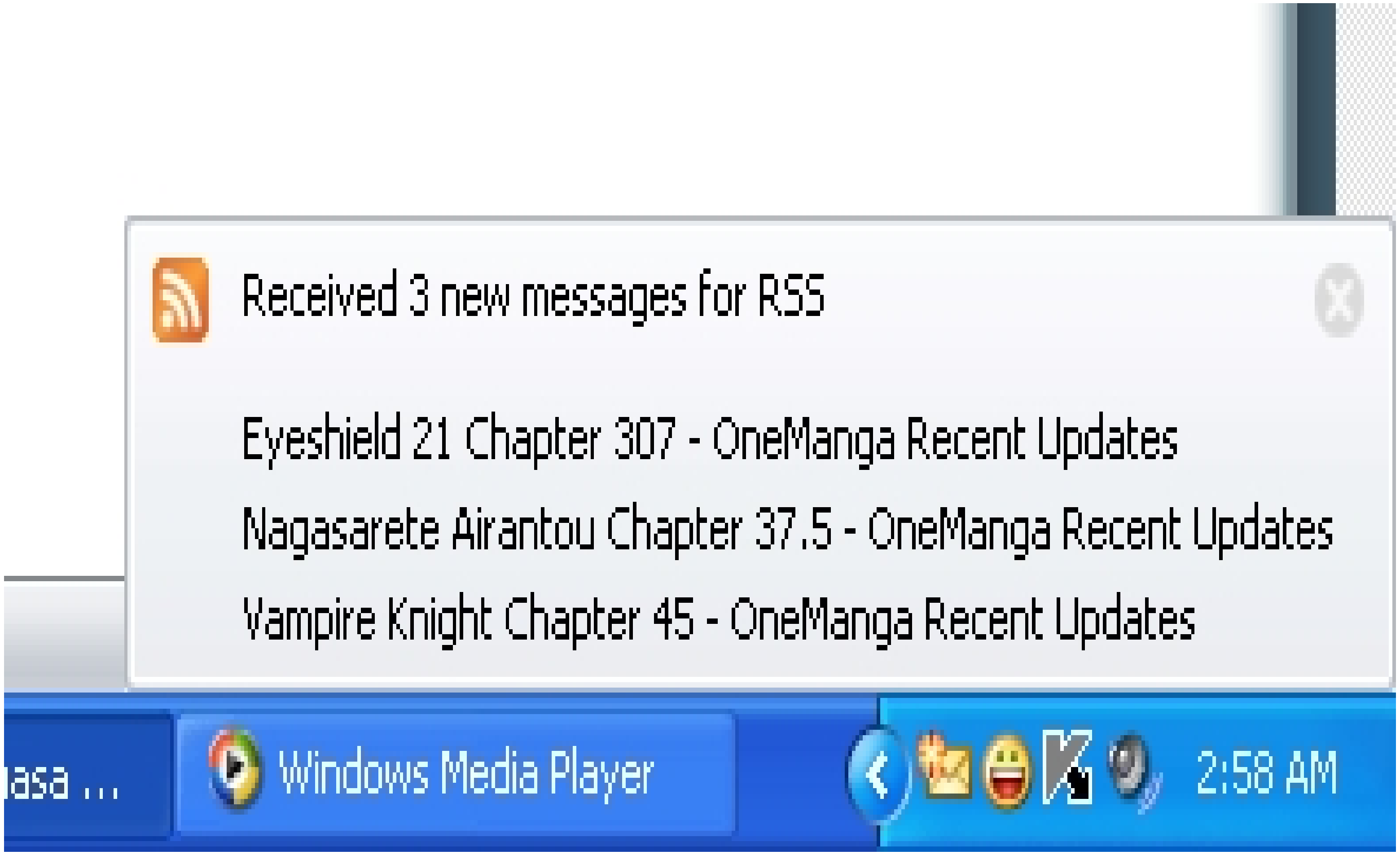
What's this?


Live TV
TV Pwr
Select
Mute
Chan
Record
Vol
Play
Fwd
Back
Slow
1
2
3
4
5
6
7
8
9
0
Clear
Enter

Proxy

- Problem context
  - Want to be able to access something remotely
- Forces
  - Want the same interface
- Solution
  - Create an element that moves the interface closer to you

What's this?


Received 3 new messages for RSS

Eyeshield 21 Chapter 307 - OneManga Recent Updates

Nagasarete Airantou Chapter 37.5 - OneManga Recent Updates

Vampire Knight Chapter 45 - OneManga Recent Updates

Observer

- Problem context
  - Want to be notified of changes without having to poll
- Forces
  - Don't want the notifier to have to know about the people being notified
- Solution
  - Keep a list of interested people and call them when a change occurs

What's this?

Chain of Responsibility

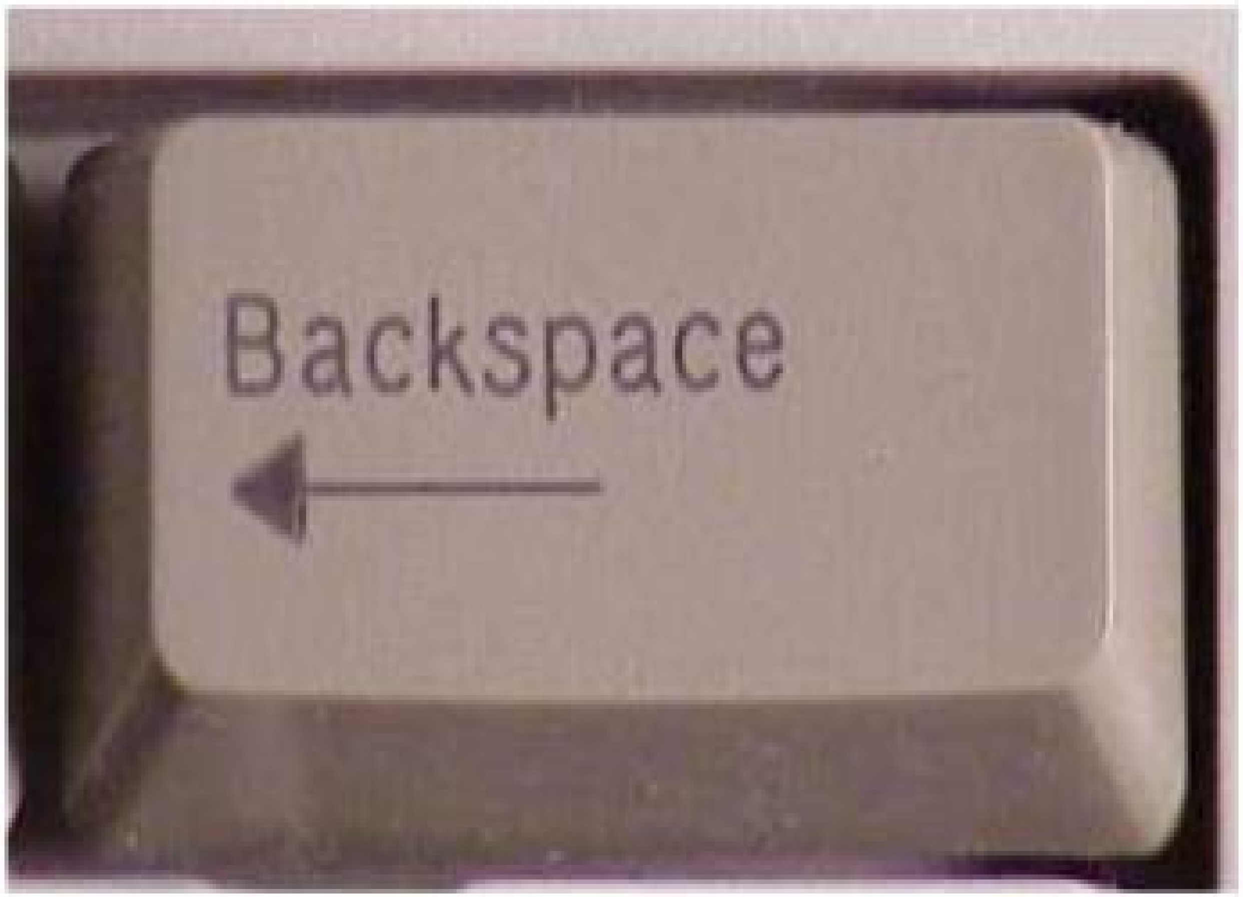
- Problem context
  - Need to ensure queries get handled
- Forces
  - Want to limit access to more expensive resources
- Solution
  - Create a chain of handlers (with the same interface) that pass on requests they can't handle

What's this?

Command

- Problem context
  - Want to encapsulate an action
- Forces
  - Want to separate what to do and when to do it
- Solution
  - Create an object that knows what to do and call it later

What's this?



Command (part 2)

- Problem context
  - Need to be able to undo actions
- Forces
  - Must integrate with “do” Command
- Solution
  - Use Command pattern and store previous state (undo information) in object

Key points

- Patterns are everywhere
- They aren't about computers and software
- Interfaces are key design point
  - Adding new ones
  - Not changing
  - Allow for substitution
- Add new objects as intermediates