

From a Client-Server based e-health Platform to a Pervasive Solution

TELEFÓNICA I+D

Date: 4th of September 2007

Spirit of
PROGRESS

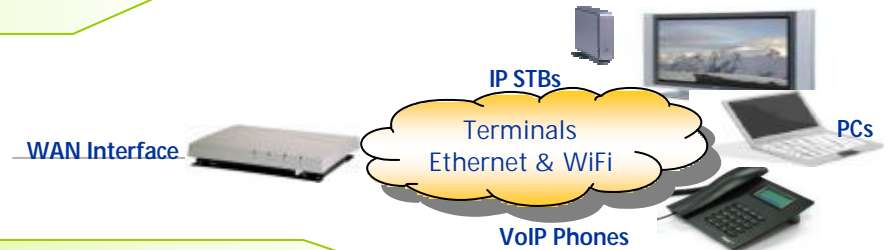
The image shows a large flock of birds in flight against a blue sky with soft, white clouds. The birds are silhouetted against the sky, with a dense group in the lower-left corner and a single bird in flight in the upper-right. The text 'Spirit of PROGRESS' is overlaid on the left side of the image. In the bottom right corner, there is a dark blue square containing the 'Telefonica' logo in a yellow, cursive font.

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01 Motivation

**Infrastructure Development
Broadband for ALL**



**New Applications...
That are Useful!
Europe NEEDS Telecare platforms!!!**

**Market Promotion
Solve the Standards Riddle
Promote and Communicate new Services**

01 Customer Trends: Requirements?



**Customers want it all
and they want it now**

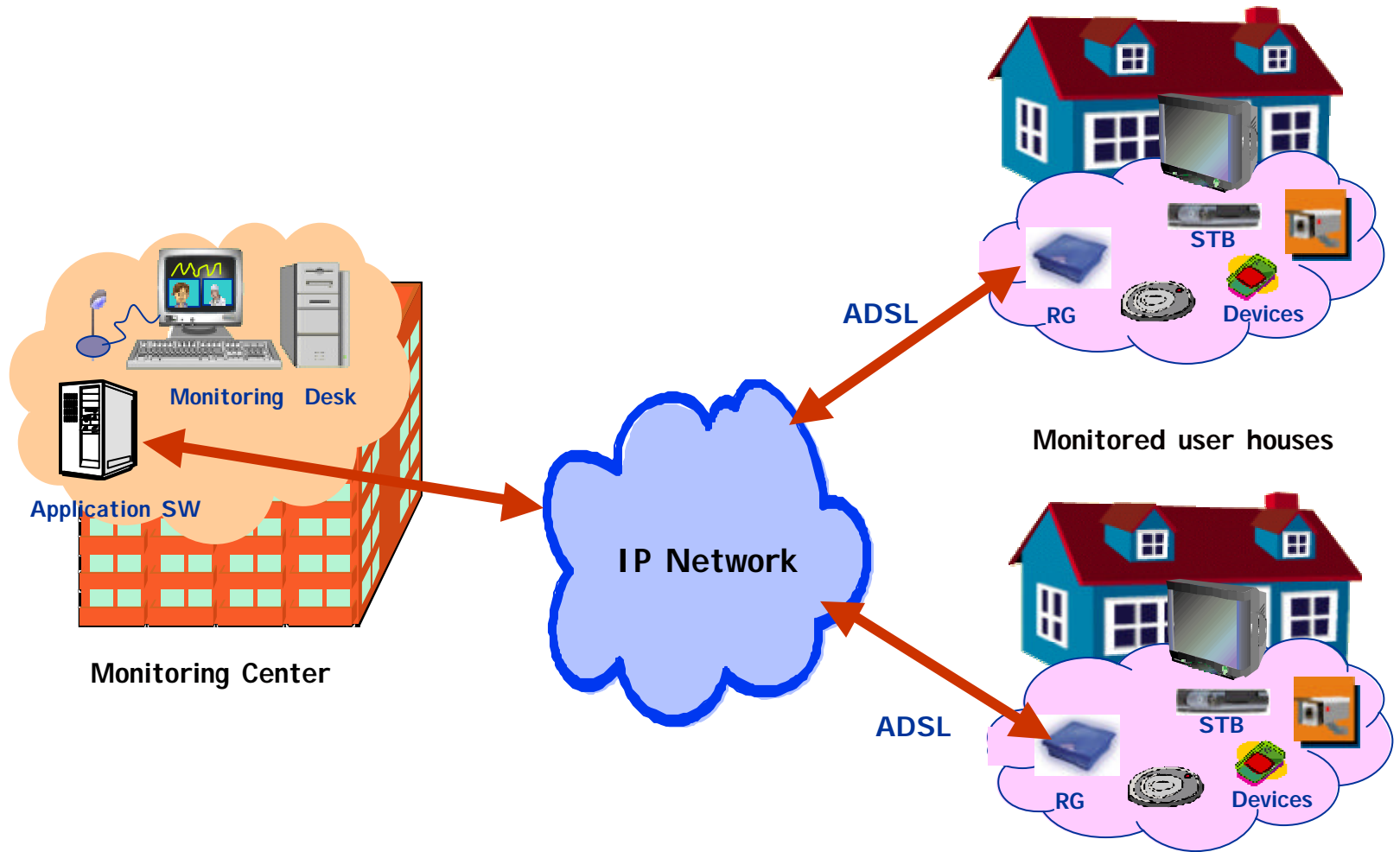
In any physical space (office,
home, car, public sites, etc.)

In any social environment
(individual, family, friends,
work, citizens, clients, etc.)

In any context (mood, health,
emergency, etc.)

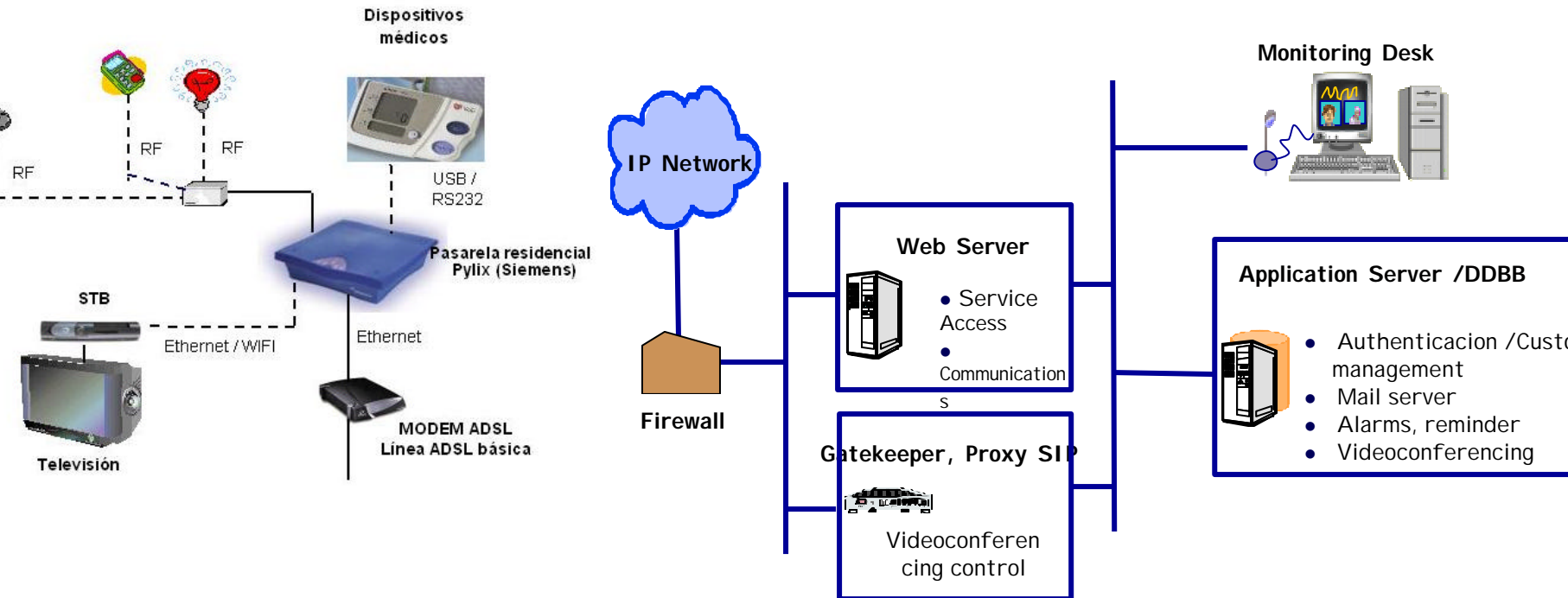


The Seguitel Platform



Infrastructure-Stakeholders and Services

- **Services: Based on a fixed Infrastructure**
 - Neither Assistants or “Patients” can move
 - Alarms, Domotics, Video-conferencing, Agenda Handling



Transformation to a Pervasive e_Health Platform

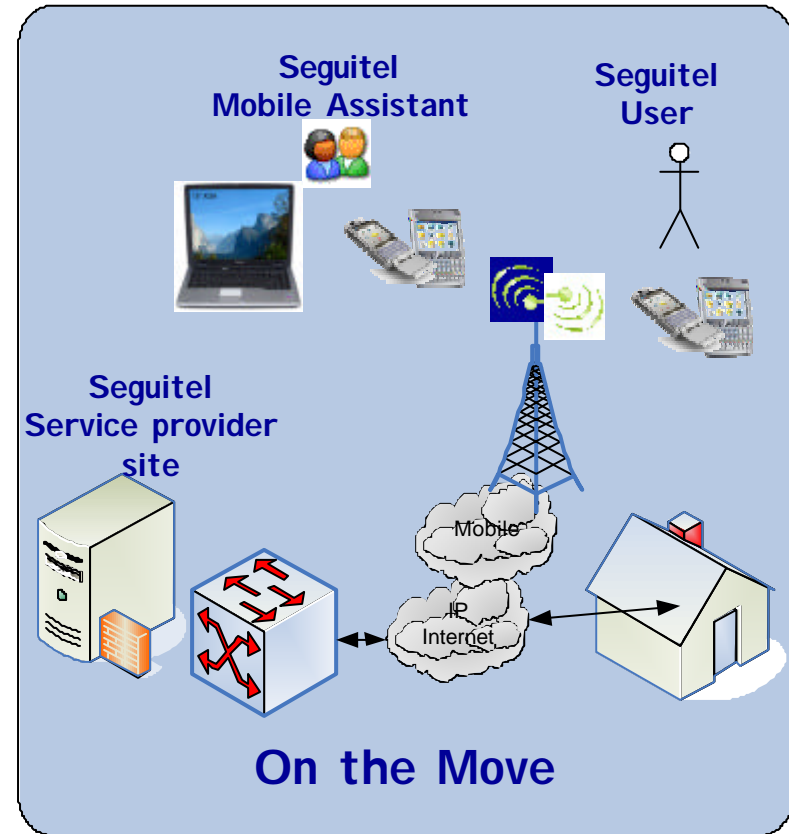
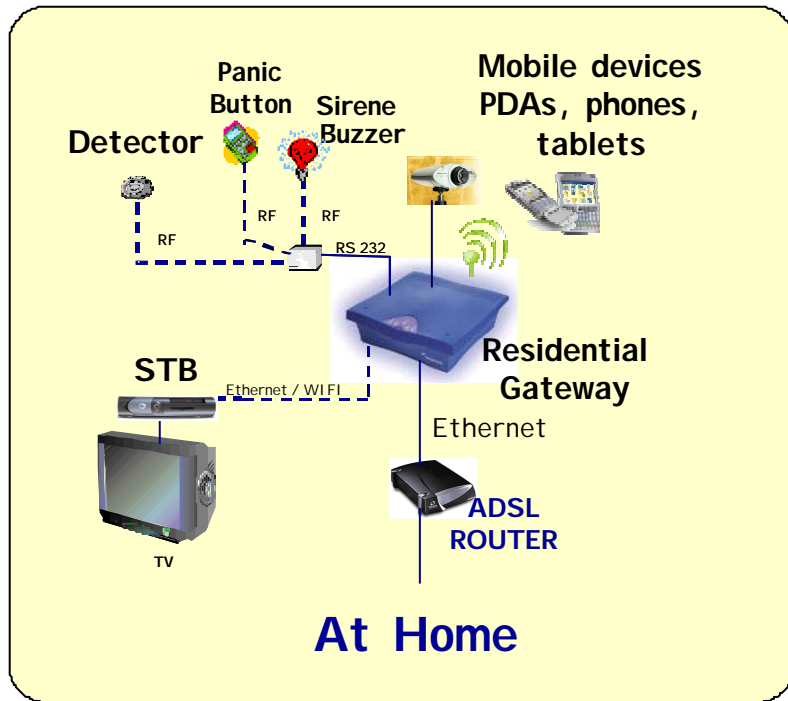
CHALLENGES:

- Extending the environment: Home and outside.
- Extending the device and Network ecosystem
- Mobility for the customer and the Service Provider

KEY ENABLERS AND OUTCOMES:

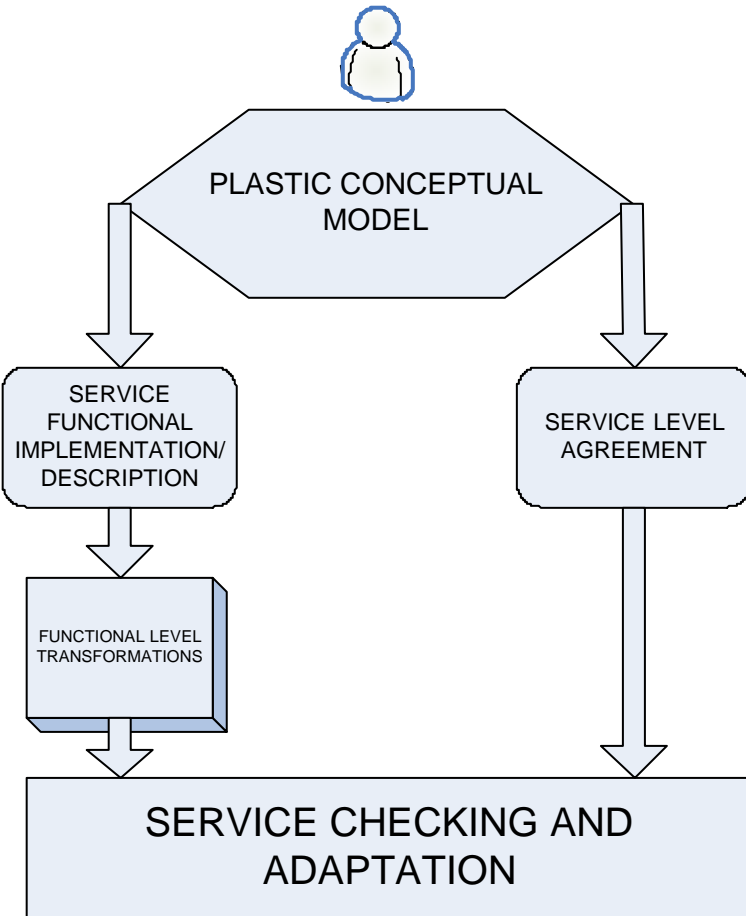
- The Plastic Platform (IST, <http://www.ist-plastic.org>)
 - Formal methodology to design and test new services over B3G environments
 - Incorporating SLA compliance at the design stage
 - Using Middleware that will allow secure and pervasive service provisioning
- The SMEPP Middleware (IST, <http://www.smepp.org>)
 - P2P Middleware solution over B3G networking
 - For embedded systems: terminals, sensors, RGs...

e_Health Platform Transformation

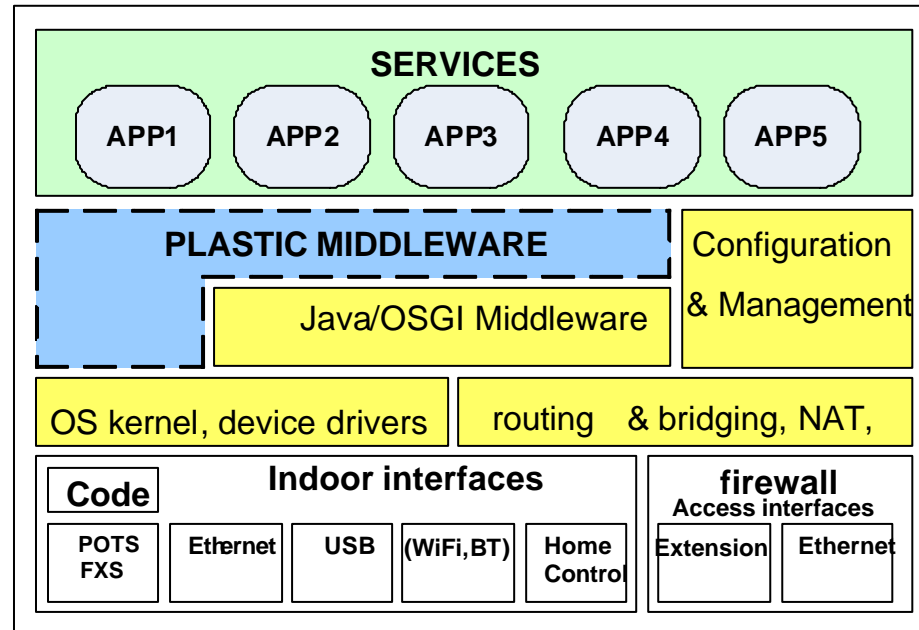


The Use of the Plastic Approach and Tools

The Methodology



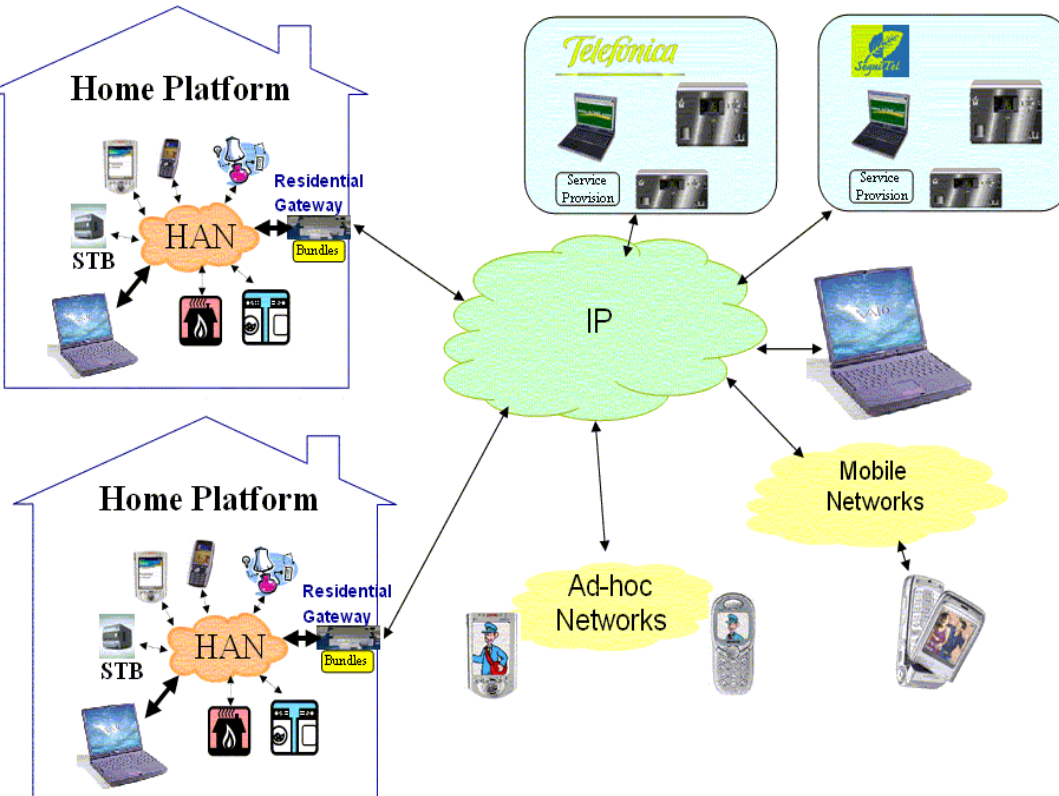
Middleware on RG or smart-phone



Middleware Capabilities

Middleware category	Available services and functionalities
Seamless and Secure Service access in a B3G Environment	Service Accessibility & Composition
	Context Awareness
	Security & Privacy
	Content Sharing and Dissemination
Communication Middleware	Web Services Oriented Communication
	Advanced Communication protocols. Embedded P2P(SMEPP)
	Multiradio Networking
	Multi-radio Device Management

The Use of the SMEPP Approach and Middleware



- Client/Server architecture will be maintained to manage:
 - Billing
 - CRM
 - Security...
- ...but enriched with P2P services and communication infrastructure.
- Heterogeneous network with a wide range of devices. Every device will act as peer, interacting by means of the SMEPP middleware.
- Peers create groups, independently of:
 - Physical location
 - Point of access to the network
 - Access technology

The New Services

- **Functionalities and Services** to implement, according to the proposed scenarios are:
 - Medical alarm router (Depending on the specialist and alarm profiles, CBR)
 - Browser
 - Notification receiver (Alarms, Reminders, Biometric measurements, Messages)
 - Notification issuer (Alarms, Reminders, Biometric measurements, Messages)
 - Notification propagator (Reminders, Messages)
 - Videostreaming/Videoconference service
 - File sharing
 - Biometric measurement diffusion
 - Management module (Groups, Users, Credentials...)
- **Execution platform** → Heterogeneous mobile and fixed devices
- **Program language** → More than one language will be necessary!!!

06 Conclusions

- Tools and Middleware are still under development...
- Services are independent in most of the cases and are progressing: Being used for the above designs.
- Prototypes have been implemented and promising results are expected.
- Still a lot of improvements are needed at the Middleware level for small devices. There is a lot of room for R&D in the area.
- The solutions offered have not to be closed, support to heterogeneous widely available and, possibly, profitable domains (devices/networks/services) must be guaranteed

Future Research Challenges

- From the Plastic and Smepp perspectives
 - Smooth integration of a platform that covers design, provision and test...: Block design (coding, simulation), system provision and optimization, simulation and test procedure generation.
 - How to handle interaction in P2P between sensor motes and other devices with better performance capabilities? How to get a consistent solution running in such a variety of devices?
 - Security and group formation procedures for the P2P Middleware
- General Challenges
 - Business plan for B3G and more concretely Ad-hoc networking (is there business around it?)
 - Zero-Touch solutions are a must!
 - No commercial or widely available Management and Operation solution for a wide variety of terminals with distinct capabilities.
 - Installation, support, updates, etc...
 - Too many languages and standards...

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