CLIPS++ contribution within the C-STAR II consortium

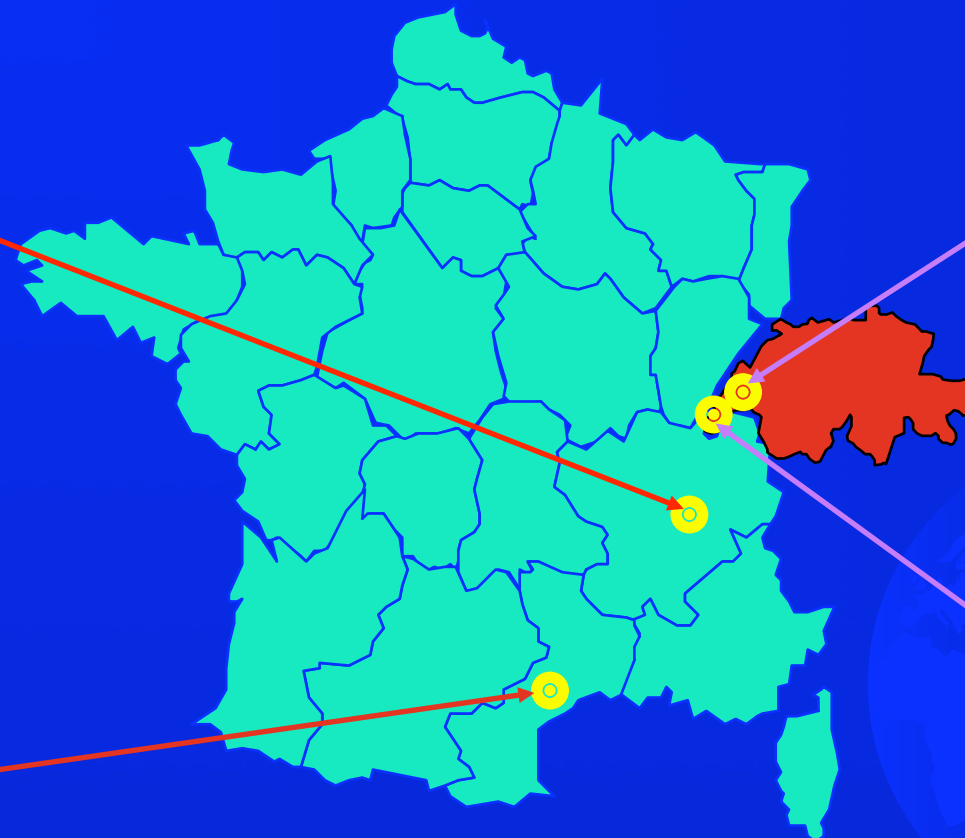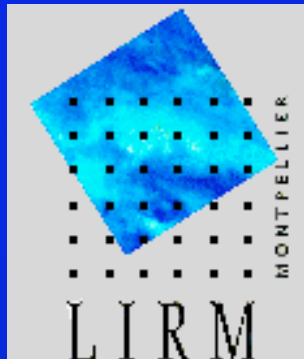Hervé BLANCHON

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Road Map

- ✦ The CLIPS++ group
  - Teams, translation approach, components
- ✦ The demonstrator
  - Architecture, Interface
- ✦ July 22th demonstration
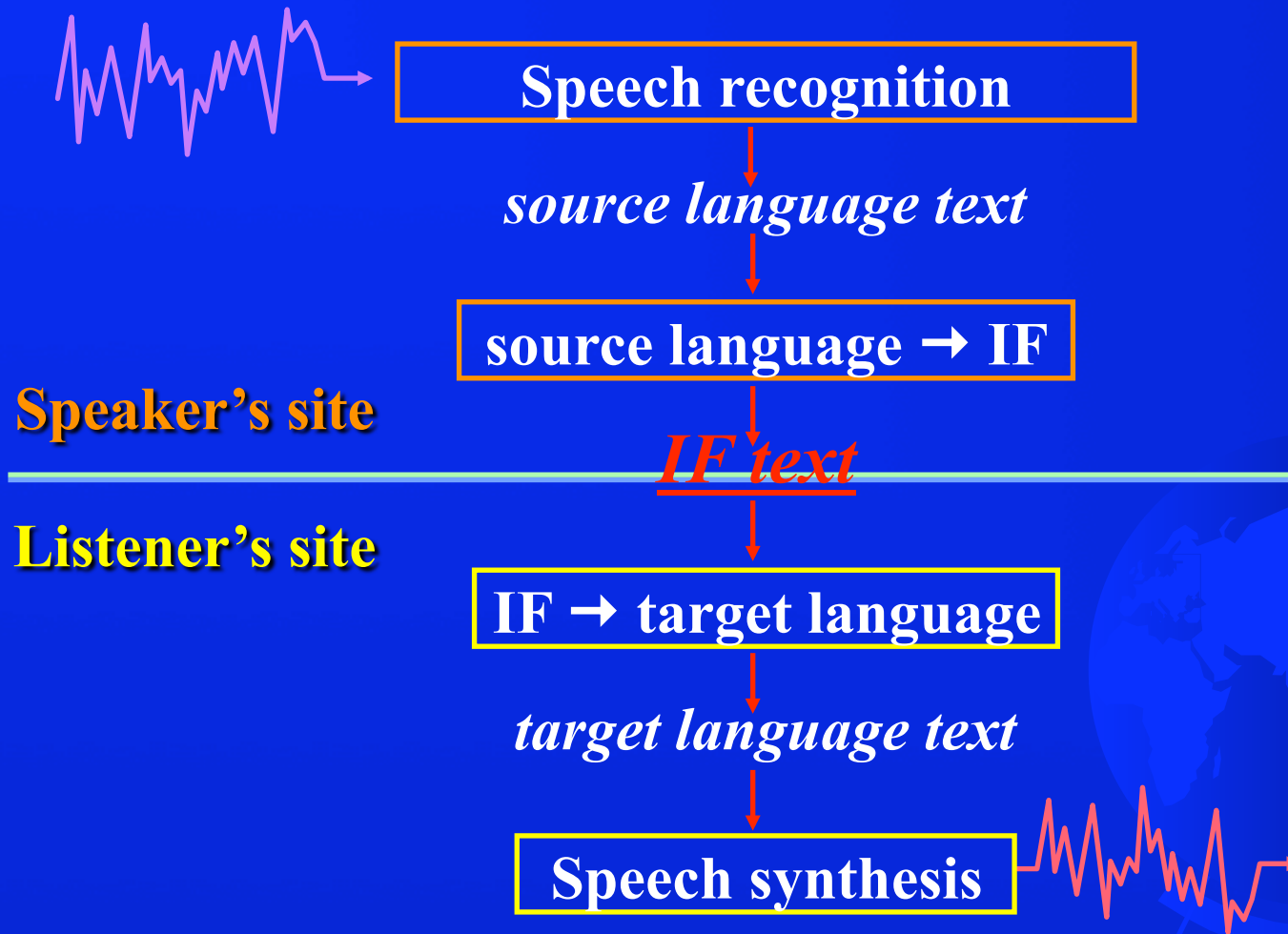 - Scenario, outcome, media coverage
- ✦ Conclusion & perspectives

The CLIPS++ partner

✦ Joined the consortium in September 1996

Choosed Translation Approach

Speech recognition

source language text

source language → IF

Speaker's site

IF text

Listener's site

IF → target language

target language text

Speech synthesis

Components for French

✦ Speech Recognition   CLIPS-GEOD

✦ French ➜ IF   CLIPS-GETA

✦ IF ➜ French   LATL

✦ Speech Synthesis   LAIP

✦ Integration   CLIPS-MULTICOM

Components: Speech Recognition

✦ Run-on Speaker Independent
  – 10k words vocabulary (centered on the domain)
  – Spontaneous continuous speech

✦ Client-server architecture

  Use of light clients over the network

✦ Based on JANUS III toolkit

  in collaboration with Karlsruhe and Carnegie
  Mellon Universities

Components: Speech Recognition

✦ Markovian acoustic model
- Trained with 20 hours of continuous speech (BREF-80 corpus)
- Context independent

✦ Stochastic language Model
- Trained with a 140 million words corpus
- Optimized for the tourism task

Components: French ➜ IF

✦ Developed with Ariane-G5
- MT systems generator (toolkit)
- 5 Specialized Languages for Linguistic Programming
- Under VM/ESA/CMS

✦ Currently running on 3 sites
- IBM 9221-130 (3,5 mips) at the CLIPS, Grenoble
- IBM 9672-R14 (40 mips) at the CCSJ, Marseille
- IBM 9672-RX5 (60 mips) in Montpellier **(IBM sponsoring)**

Components: French ➜ IF

✦ Word spotting + local syntactic analysis

  – **Input**: orthographic transcription of the spoken utterance

  – Morphological analysis & lemmatization of the word

  – First French → IF transfer dictionary look up

  – Local syntactic analysis for semantically useful data

    ◆ Dates, quantity, numbers, price

  – Second French → IF transfer dictionary look up

  – Syntactic generation of the IF

  – Morphologic generation of the IF

  – **Output**: IF text

Components: IF ➜ French

✦ Partly developed with GBGen

  – Syntactic generation module with broad lexical & grammatical coverage

  – Deterministic system based on a generative grammar

✦ From an IF to a natural language text

  – Correspondence between the IF and a GBGen semantic structure

  – Generation independent from the application.

Components: IF ➜ French

IF

↓

Correspondence procedures

Semantic GBGen structure

↓

Generation procedures

Syntactic structure

↓

Morphological rules

↓
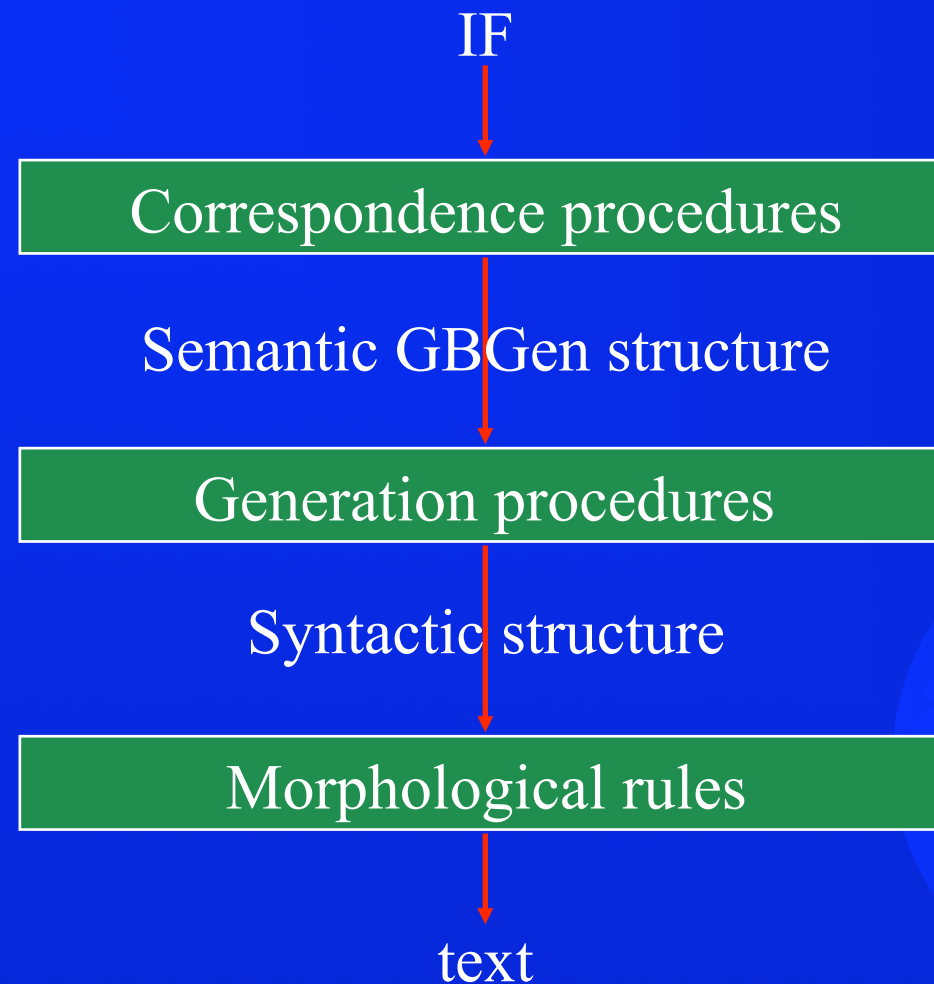
text

Components: Synthesis

✦ LAIPTTS : a rule-based TTS synthesizer

✦ 3 modules

  – Conversion "text towards phonemes"

  – Prosody generation

  – Signal generation

Components: Synthesis

- ✦ Conversion "text towards phonemes"
  - – General (540) & specialized (numbers, abbreviations, fixed formulæ, etc.) rules
  - – General (7000 words) & specialized (proper nouns) dictionaries
- ✦ Prosody generation
  - – Psycho-linguistic rules
- ✦ Signal generation
  - – Mbrola technique from the Mons University

Demonstrator's software architecture

France   CMU

Reco.

F → IF

IBM Montpellier

LOCAL COMSWITCH

ITG

GLOBAL COMSWITCH

IF → F

Synthesis

ISDN   **LAN**
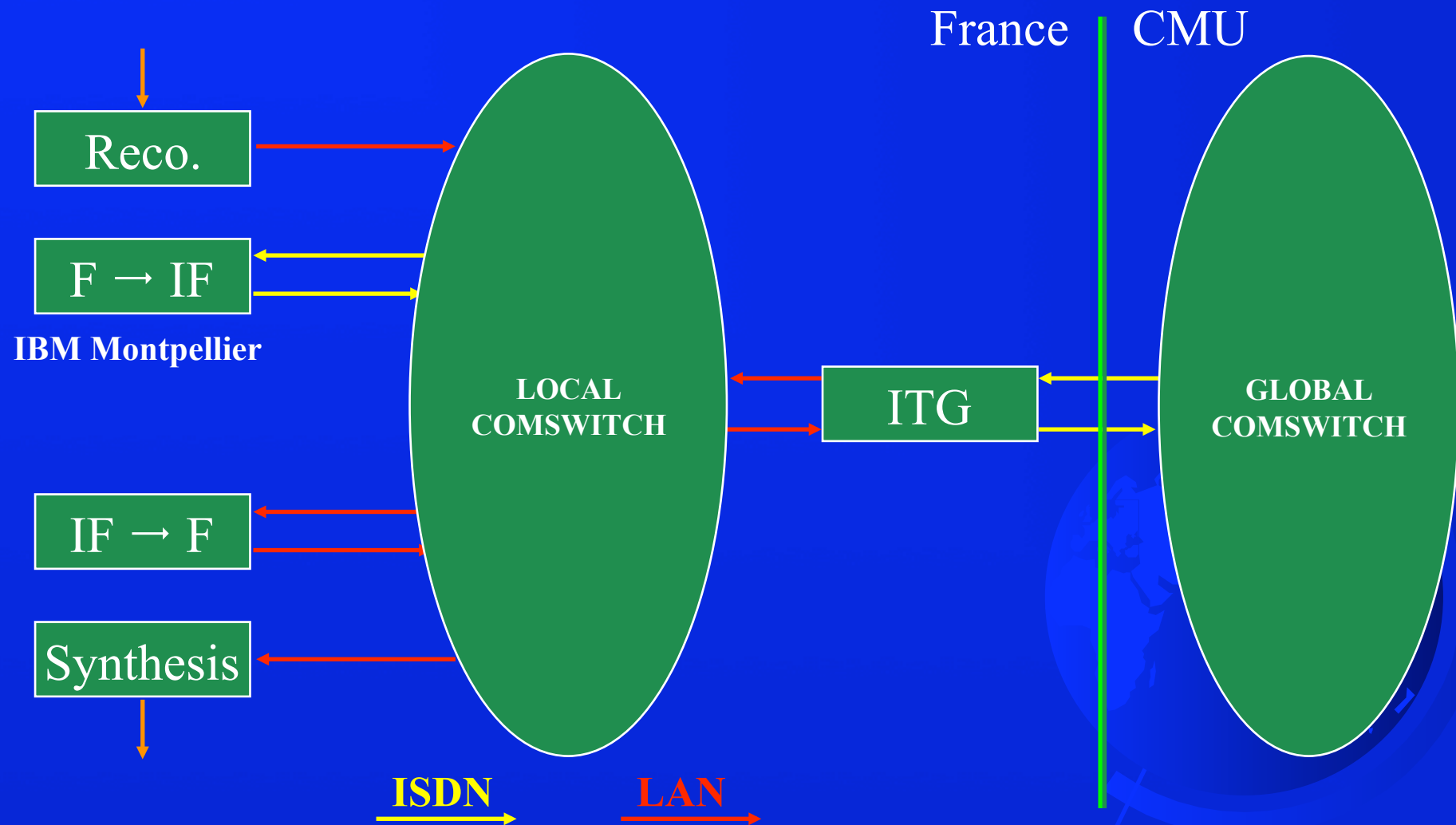
Demonstrator's hardware architecture

F → IF

control
IF → F

visio-
conference

User interface
Reco client

Reco server

synthesis

IBM (Montpellier, Marseille)   PC (local Grenoble)
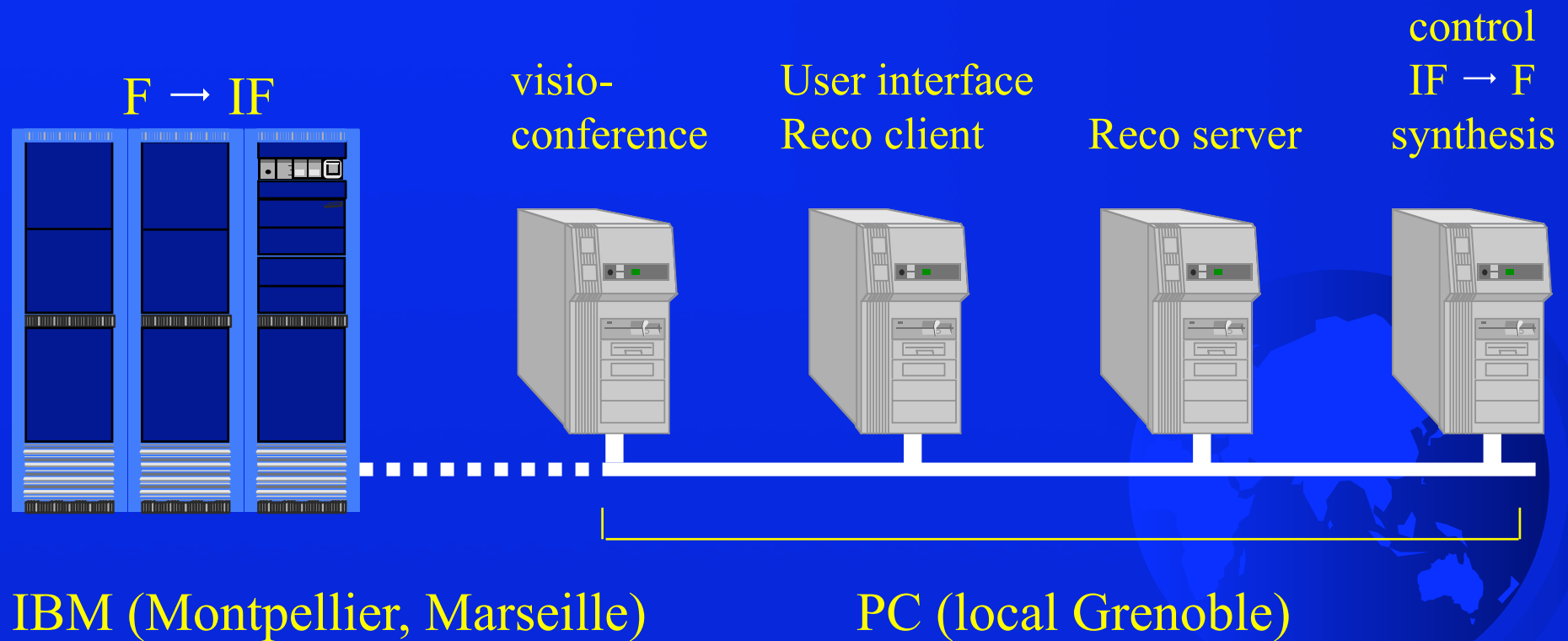
Demonstrator's interface

July 22nd's demo scenario

✦ Opening with all synthesis on

✦ Trip to Taejon

✦ Trip to New York

✦ Trip to Heidelberg

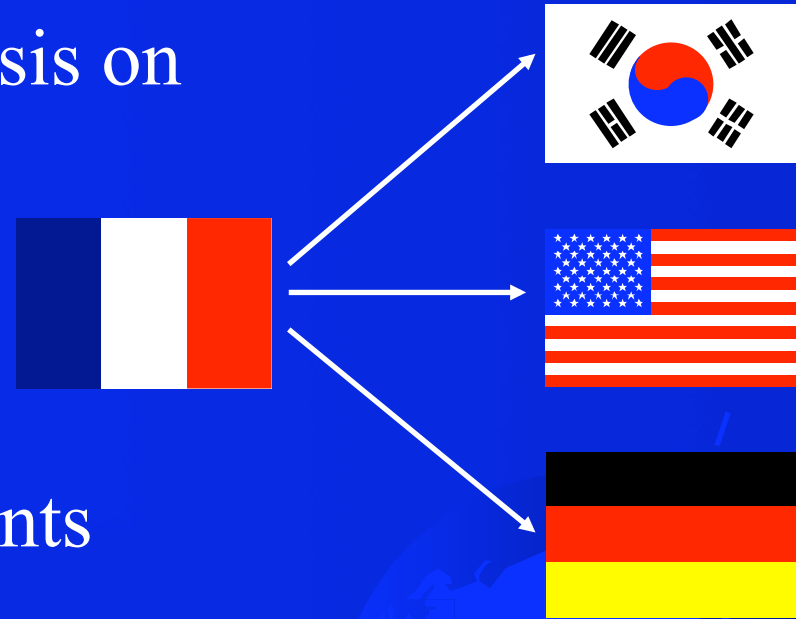✦ Thanks to the travel agents

✦ About 30 minutes

✦ Travel agent for ETRI

July 22nd's demo outcomes

- Audience and sponsors were very satisfied
  - Opening ceremony was well received
  - Korean impressed people
  - Entertaining "errors"
- The overall speed was not commented
- People asked for the release of commercial applications
- Videoconference problem imposed improvisation

July 22nd's demo media coverage

✦ **Good** even if the date was not that good for the French media

✦ <u>Press</u>

  – National and scientific

✦ <u>Radio</u>

  – Local, National, News broadcaster

✦ <u>Television</u>

  – Local, (National)

✦ There is still an interest and new contacts

Conclusion & prospect

✦ Good results

✦ Very effective cooperation

✦ Snow ball effect

✦ Looking forward to technological transfer

   – Necessity to find niches

✦ Demo for IBM may initiate private companies' interest (27th of October with ETRI and CMU?)