

ReSIST

Resilience for Survivability in IST

A European Network of Excellence



Information Society
Technologies



SIXTH FRAMEWORK PROGRAMME



Second Open Workshop



SAPIENZA
UNIVERSITÀ DI ROMA

 **DEEPBLUE** consulting&research

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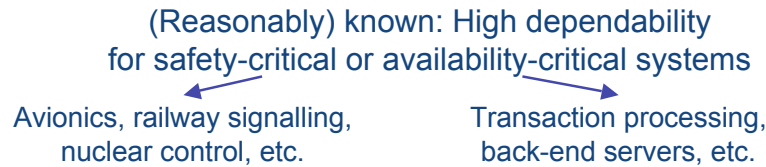


SIXTH FRAMEWORK PROGRAMME



- Rationale
- Resilience: definition and technologies
- Joint Programme of Activities, and Logic
- Partnership
- Organisation
- Results, and near future
- **Workshop Programme**

Rationale

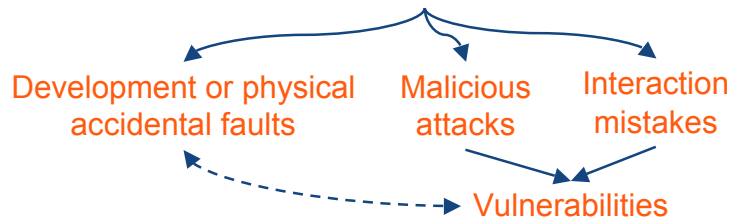


Large, networked, evolving systems constituting complex information infrastructures — perhaps involving everything from super-computers and huge server farms to myriads of small mobile computers and tiny embedded devices, i.e., *ubiquitous systems*

Dependability gap: necessary trust for realistic Aml ↔ operational statistics

Scalability of Dependability

In addition to rigorous functional design, provision of **Resilience for Survivability**



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Resilience

➡ in dependability and security of computing systems

➡ in other domains

❖ Adjective Resilient

- In use for 30+ years
- Recently, escalating use → buzzword
- Used essentially as synonym to fault tolerant
- Noteworthy exception: preface of *Resilient Computing Systems*, T. Anderson (Ed.), Collins, 1985

«The two key attributes here are dependability and robustness. [...] A computing system can be said to be *robust* if it retains its ability to deliver service in conditions which are beyond its normal domain of operation»

Adaptation to changes, and getting back after a setback

- Material science
- Social psychology
- Child psychiatry and psychology
- Ecology
- Business
- Industrial safety

❖ Fault and change tolerance



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At stake: Maintain dependability in spite of changes

Dependability: The ability to deliver service that can justifiably be trusted

Resilience: The persistence of service delivery that can justifiably be trusted, when facing changes

Nature

- Functional
- Environmental
- Technological

Prospect

- Foreseen
- Foreseeable
- Unforeseen

Timing

- Short term
- Medium term
- Long term

☞ The definition does not exclude the possibility of failure

Alternate definition of dependability

Ability to avoid service failures that are unacceptably frequent or severe



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Technologies for resilience

Changes → **Evolvability**

☞ Adaptation

Trusted service → **Assessability**

☞ Verification and evaluation

Ubiquitous systems → **Usability**

☞ Human and system users

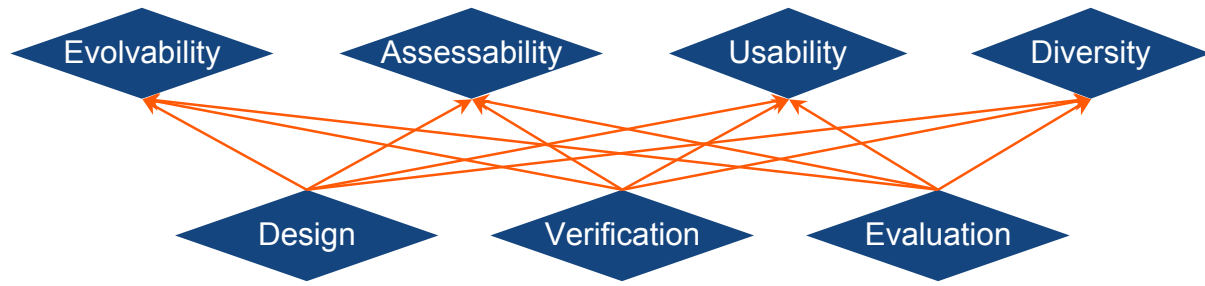
Complex systems → **Diversity**

☞ Taking advantage of existing diversity for avoiding single points of failure, and augmenting diversity

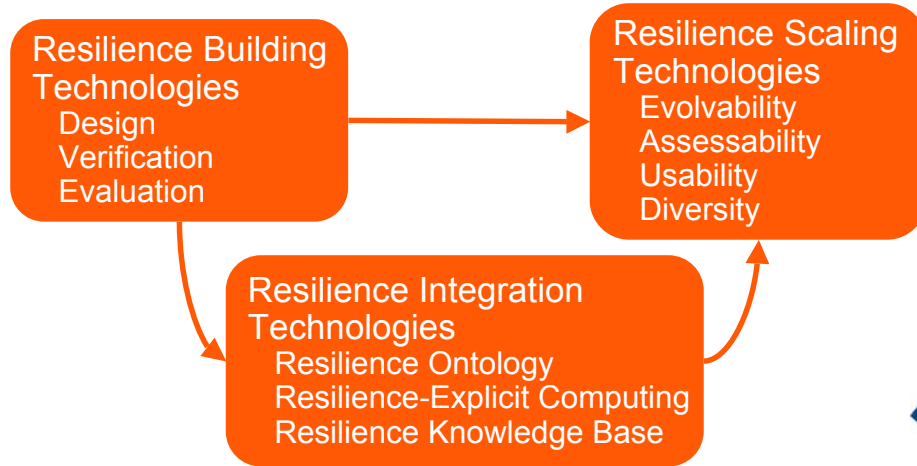


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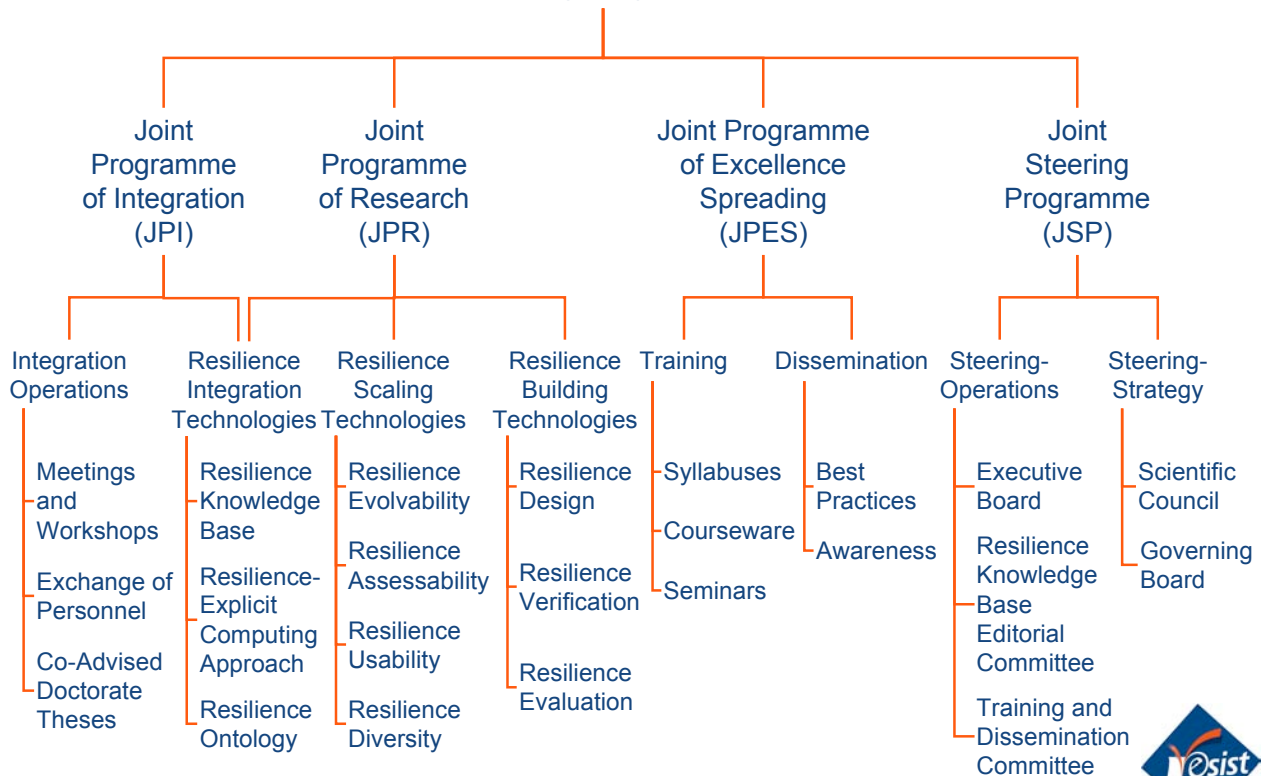
Joint Programme of Activities



Logic of Joint Programme of Research



Joint Programme of Activities (JPA)



Partnership

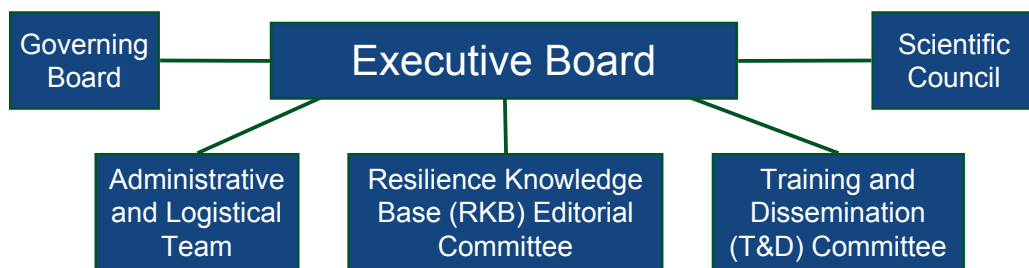
| | Expertise | | | Country | Academia (Ac) / Industry (Ind) |
|----------------------------|---|---|------------------|---------|--------------------------------|
| | Threat resilience: development or physical Accidental faults (A) / Malicious attacks (M) / Interaction mistakes (I) | | Mobile computing | | |
| LAAS-CNRS [coordinator] | A | M | | FR | Ac |
| Budapest U. | A | | | HU | Ac |
| City U., London | A | M | I | UK | Ac |
| Darmstadt U. | A | M | | DE | Ac |
| Deep Blue | | | I | IT | Ind - SME |
| Eurecom | | M | | FR | Ac |
| France Telecom R&D | A | M | | FR | Ind |
| IBM Research Zurich | | M | | CH | Ind |
| IRISA | A | | | FR | Ac |
| IRIT | | | I | FR | Ac |
| Vytautas Magnus U., Kaunas | A | | | LT | Ac |
| Lisbon U. | A | M | | PT | Ac |
| Newcastle U. | A | M | I | UK | Ac |
| Pisa U. | A | M | I | IT | Ac |
| QinetiQ | A | M | | UK | Ind |
| Roma-La Sapienza U. | A | | | IT | Ac |
| Ulm U. | A | | | DE | Ac |
| Southampton U. | Semantic Web | | | UK | Ac |

110 researchers plus 61 students, 3 year duration

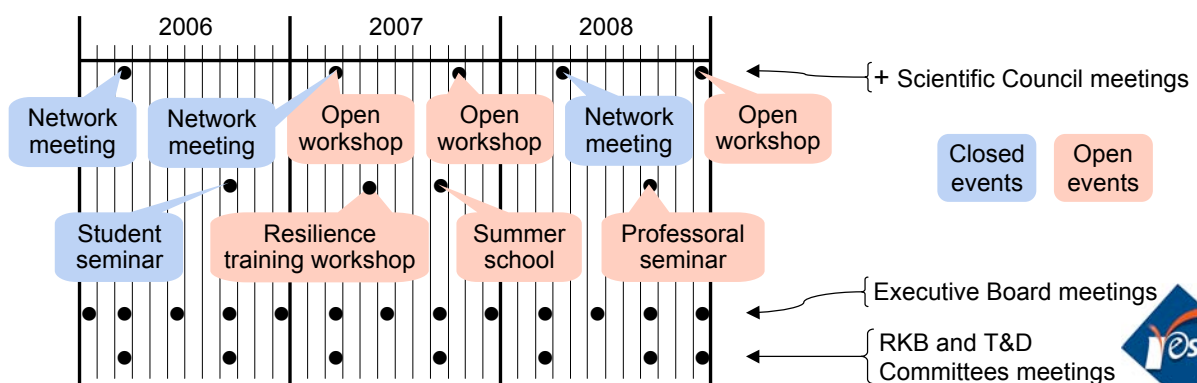


Organisation

Management



Event Schedule



Results

❖ Major achievements

- 83 co-authors
 - ✓ State of Knowledge in Resilient Computing
 - ✓ Research Agenda in Resilient Computing
- Prototype of the Resilience Knowledge Base: 40 millions basic facts

❖ Ground work

- Resilience-Explicit Computing approach
- Best Practice document
- Training
 - ✓ Curriculum in Resilient Computing: draft
 - ✓ Courseware in Resilient Computing: outline

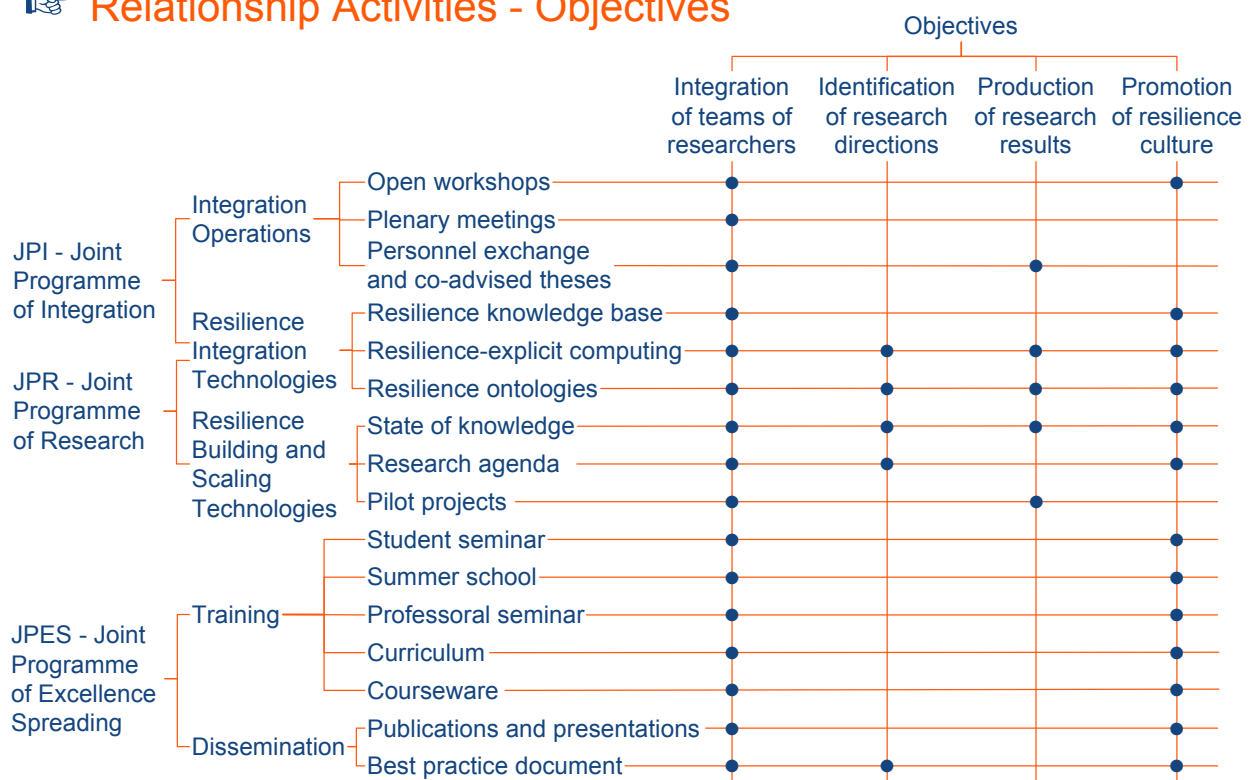
❖ Organisation of significant events

- Plenary network meetings: March 2006, Toulouse, and March 2007 Budapest
- Open Workshops: March 2007, Budapest, and October 2007, Roma
- Student seminar: September 2006, San Miniato
- Resilience Training open workshop: May 2007, Erlangen
- Summer school: September 2007, Porquerolles



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👉 Relationship Activities - Objectives



👉 Pilot Projects in Resilience Scaling Technologies, by junior researchers and doctorate students: **Coming**



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Second Open Workshop Resilience in Computing Systems and Information Infrastructures: A Research Agenda



Aim: presenting the findings of ReSIST on the research directions for resilience of computing systems and information infrastructures to enable their dependability and security to scale-up

- Opening session
 - ✓ Welcome
 - ✓ From resilience to ReSIST
 - ✓ From resilience-building to resilience-scaling technologies
- Sessions devoted to resilience-scaling technologies
 - ✓ Presenters : members of ReSIST, summarise the proposed research directions
 - ✓ Responders: leading practitioners external to ReSIST, independent reaction from industrial perspective
- Concluding session: views of the European Commission

| | |
|---------------|--------------------|
| 8h30 - 9h30 | Opening Session |
| 9h30 - 10h25 | Evolvability |
| 10h25 - 10h45 | Coffee Break |
| 10h45 - 11h40 | Assessability |
| 11h40 - 12h35 | Usability |
| 12h35 - 13h30 | Lunch |
| 13h30 - 14h25 | Diversity |
| 14h25 - 15h25 | Concluding Session |

Presenter: 20 mins
Responder: 15 mins
Discussion: 20 mins

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