

DESEREC

Dependability and Security by Enhanced Reconfigurability

An ICT for Trust and Security research project
addressing
the dependability of Information systems



Dependability & Security by Enhanced Reconfigurability



Information Society
Technologies

Dependability concerns

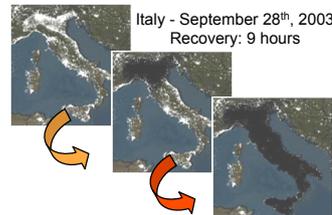
- The everyday life of European citizens relies on critical activities supported by networked Information Systems (I.S.):

- **Communications** (telephone, Internet)
- **Energy & fluids** (electricity, gas, water)
- **Transportation** (railways, airlines, road)
- **Health and emergency response**
- **e-Government**



- So far, limited taken actions let these I.S.

- ▶ not failure-proof enough to face:
 - **Software & hardware faults**
 - **Malicious actions: intrusion, virus**
- ▶ with poor self-healing capability
 - **and therefore sensitive to cascading effects**
- ▶ suffering long recovery time



- The DESEREC project aims to leverage those capabilities
 - ▶ in new and existing Information Systems



Why DESEREC?

The picture

- Administrators are swamped by information of inappropriate level
- Most of the decisions are taken short-term, with poor mid-term capability to arbitrate between business services with different criticality
- No synthetic view on dependability is provided



The proposed approach

- Provide information and interaction at *service* level instead of *component* level for day-to-day management
- Bring high-level management capabilities giving the ability to react appropriately upon errors/failures to maintain critical services
- Support mid-term strategy with planning and simulation tools enabling a proactive management of performance and dependability

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The 3-tiered approach proposed by DESEREC

First objective – **Detect & Prevent**

- Detect proactively incident and potential fault
- Keep as much as possible every failure local
 - ▶ Contain the incident: isolate the compromised area



Containment

Second objective - **React**

- Sustain or quickly resume the critical applications
- Reallocate resources used by less critical ones



Reconfiguration

Third objective – **Plan**

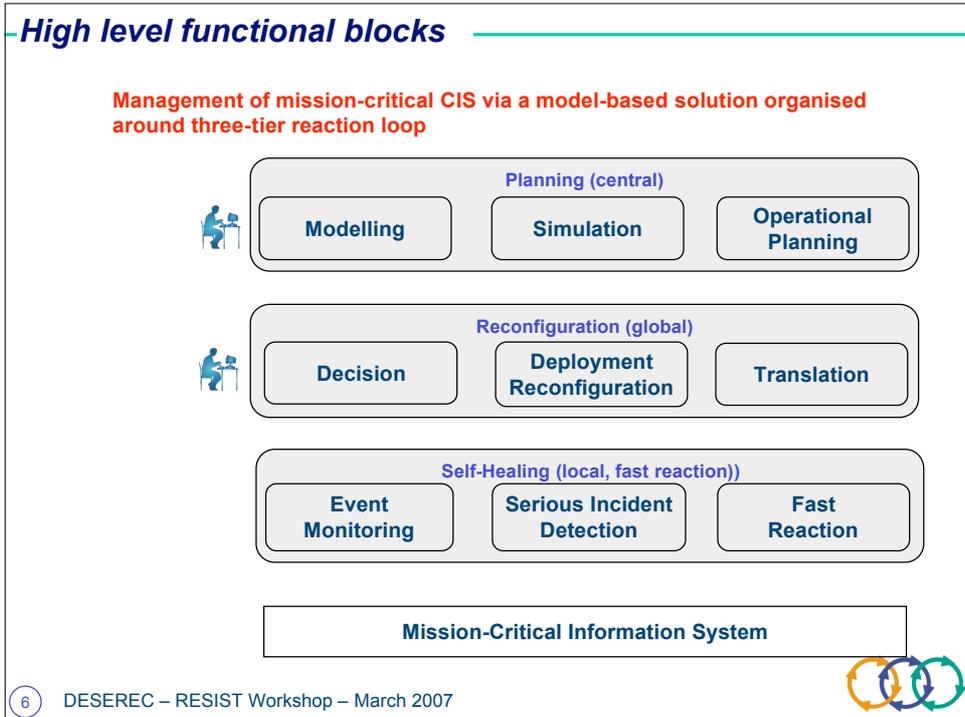
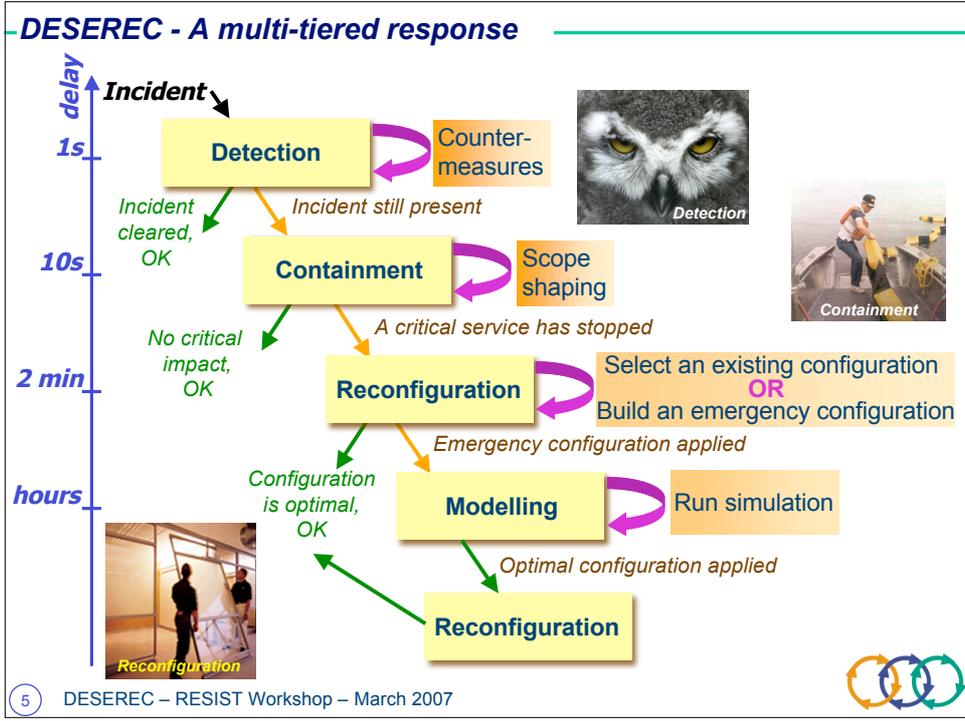
- Reallocate optimally the resources to recover the full range of services
- Validate the configurations by simulation



Planning

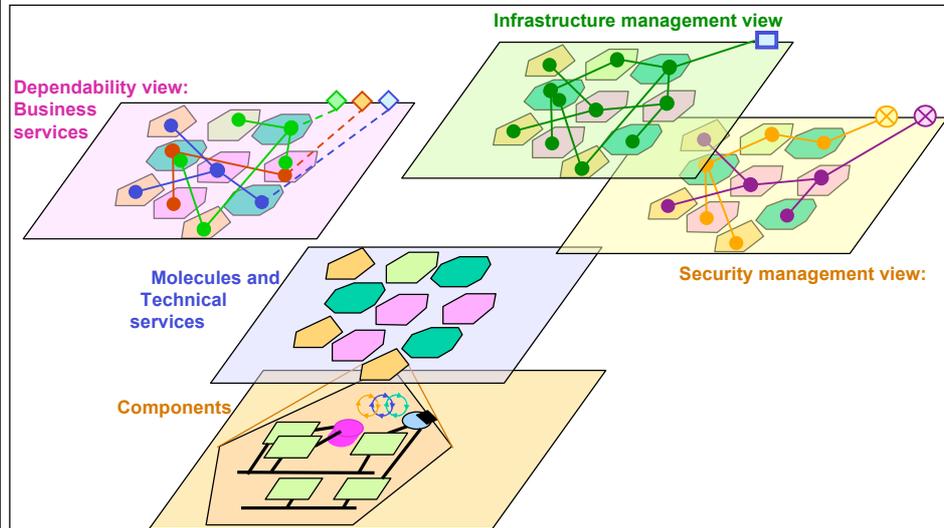
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CIS seen as a cluster of molecules

- Introduce the molecule and multiple functional plans/views



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DESEREC Approach to resilience

- Optimizing the resilience of the Information System at the business service level
- The improvement of the resilience is achieved by optimizing the use of the available resources through reconfiguration
- Resilience engineering is one of the objective of DESEREC providing a learning mechanism for improving proactive reaction to incidents

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