

TRONE: Trustworthy and Resilient Operations in a Network Environment

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ICT PORTUGAL Workshop:
New Projects in Networks, Software, Energy and Security
March 1, 2011

TRONE

Information and Communication Technologies Institute
CarnegieMellon | PORTUGAL
AN INTERNATIONAL PARTNERSHIP

Motivation

- Technology push:
 - Next Generation Networks (NGN)
 - Need for seamless integration of new and heterogeneous technologies
- Consumer pull:
 - More demanding requirements
 - Increased QoS and QoP: *fast is not enough*
- The challenges:
 - Increased operational risks
 - Inadequate network operation and management

Vision

- Innovative solutions for *Network Operation, Administration and Management (OAM)*
 - *Proactive* hazard reduction: **architectural robustness**
 - *Reactive* hazard reduction: **detection and recovery**
- Achieve **trustworthy network operation**
 - Dynamic dependability and security enforcement
 - Diagnosis, detection and prevention/tolerance
 - Automatic reconfiguration
 - Self-stabilizing like behavior

Project Team



FCUL: Paulo Veríssimo, António Casimiro



FCTUC: Filipe Araújo, Marília Curado

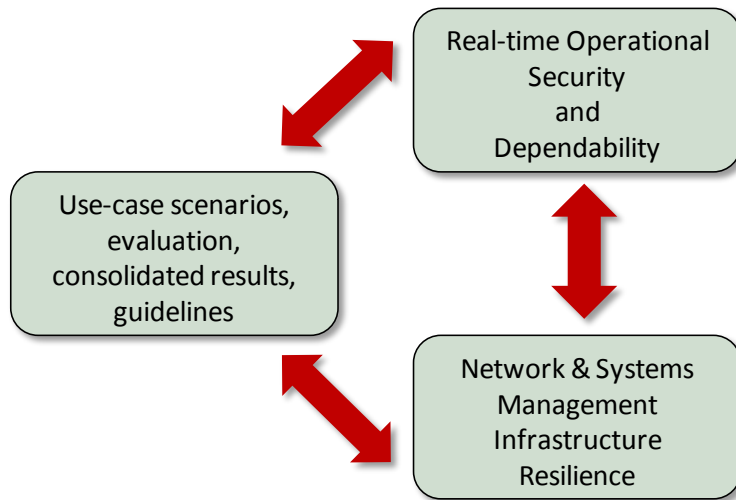


CMU: Priya Narasimhan



PT: José Constantino, Maximilian Xavier

Approach



- Measures to ensure real-time operational security & dependability
 - On-line fault/failure diagnosis
 - Automated reconfiguration and dynamic adaptation
- Architectural components & middleware
 - Resilient firewalls, based on redundancy and proactive recovery
 - Resilient communication protocols
- Technology demonstrators & prototypes
 - Use cases from operator supplied scenario

PT Cloud computing scenario



Potential threats

- Attacks to Cloud Computing infrastructure
 - Hypervisor
 - Virtualization platform
 - Other guest virtual machines
 - Network components
 - Storage platform
 - Deployed controls
- Attacks to Orchestration/Management Controls
 - Privilege escalation in front end systems
 - Disruption of order entry
 - Unauthorized use of resources

Impact



- Security and resilience are crucial to IT providers
- TRONE is performing **cutting edge research**
- Results and knowledge in this area will represent a **competitive advantage**, directly applicable in new infrastructures

TRONE on the web

<http://trone.di.fc.ul.pt>

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