Real-time and Embedded Systems Forum

Spotlight

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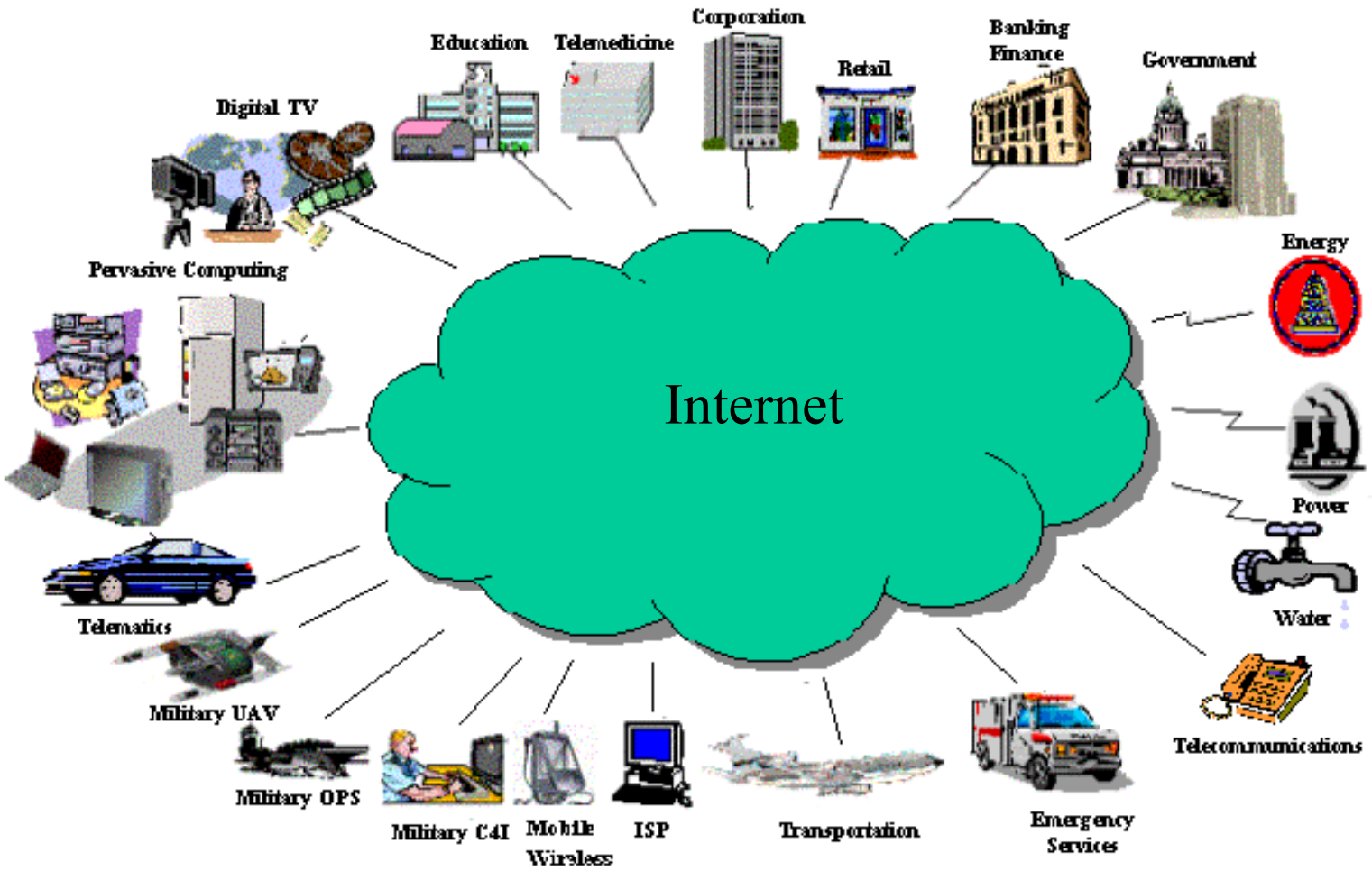
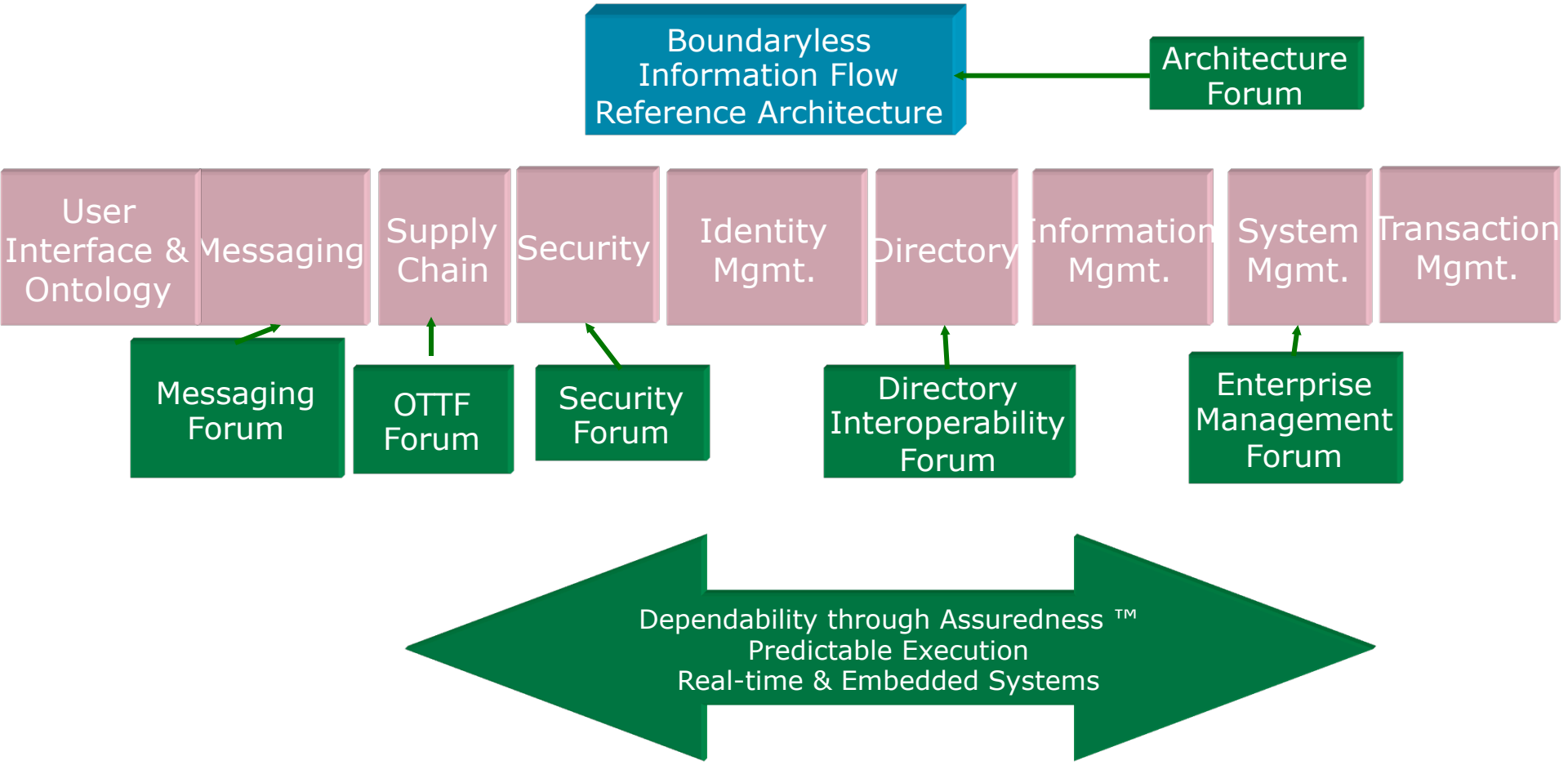
“The Boundaryless Enterprise”



Software with Real-time and High Assurance will make the Boundaryless RT Enterprise deterministic, integrated and flexible.

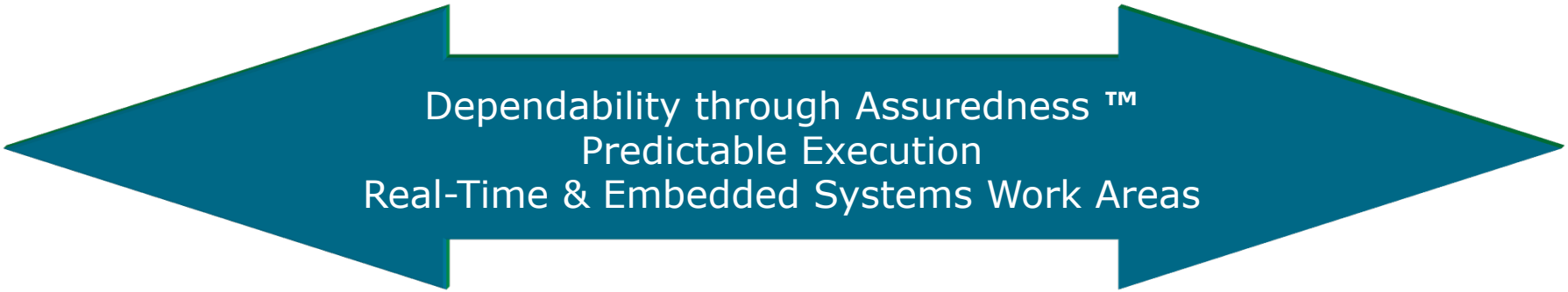
The Open Group Forum Coverage



Real-time & Embedded Systems Forum

- ***RTES Vision***
  - Employ widely supported and open real-time standards and enabling technologies to deliver testable and certifiable, cost-effective, mission-capable systems.
- ***RTES Mission***
  - Improve the time and cost to market adoption of real-time and embedded solutions by providing a forum where we can share knowledge and integrate open initiatives, and certify approved products and processes.

Real-time & Embedded Systems Forum Coverage



Open Architecture for RTES	IEEE POSIX® RT Standards, Profiles & Certification	RT (Security & Safety) Critical Systems MILS	Safety Critical RT Java/ JSR302	Secure Mobile Architecture

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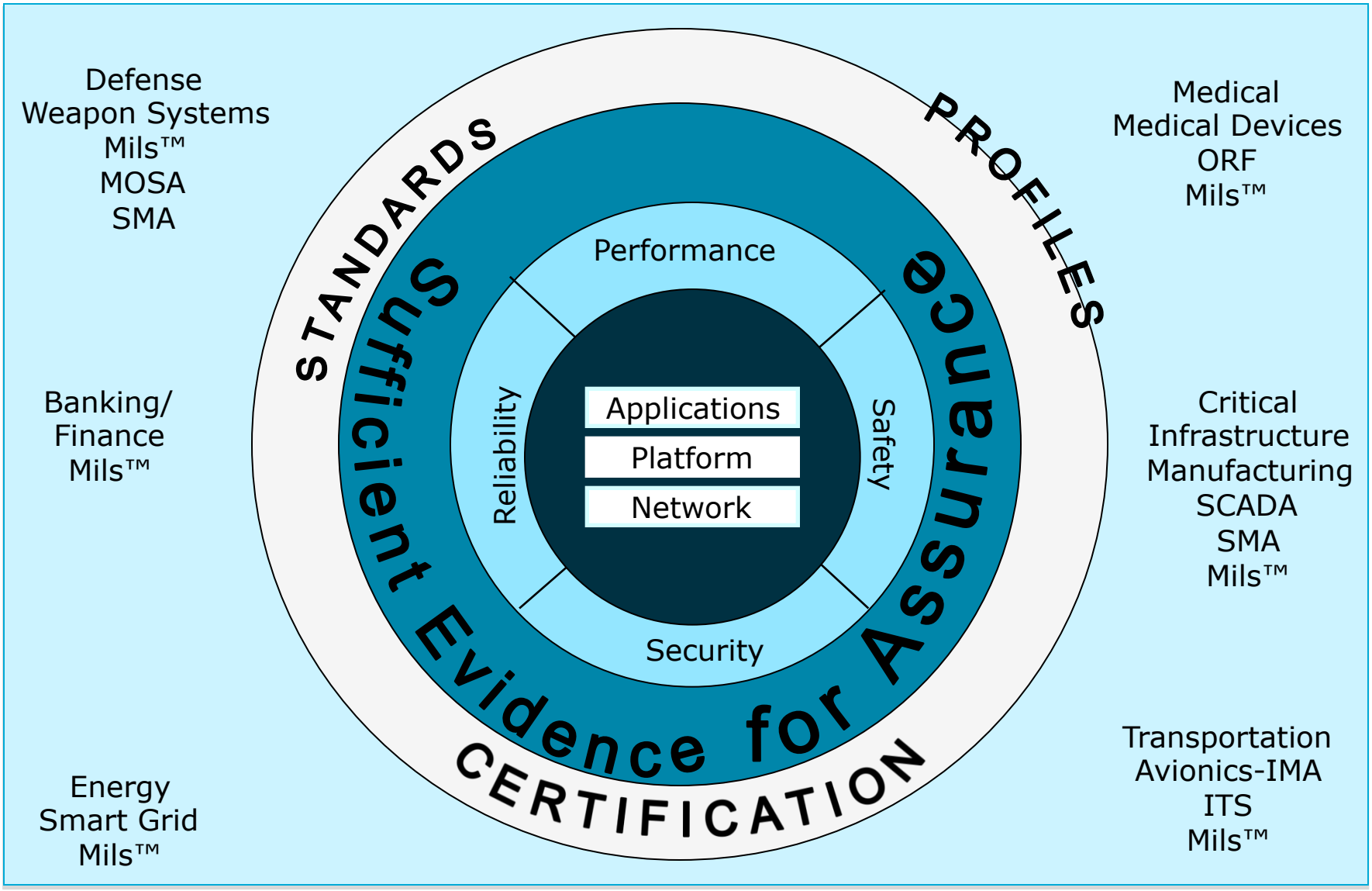
"Dependability through Assuredness™"



RTES Forum Activities

- **Work Areas:**
  - Dependability through Assuredness™
  - OA for RT – Architecting to the Edge™
  - TOGAF™ to the Platform
  - Cross Domain Security for RT – Mils™ Architecture
  - RT Java for Safety/Mission Critical Environments – JSR302
  - High Assurance, Safety Critical Environments
  - Safety/Mission Critical Applications
  - Mils™ APIs Standard (POSIX & ARINC 653)
  - Independent Evaluation & Certification Scheme for COTS Components/Systems
  - Component Competition Readiness Levels (CCRLs)
  - IEEE POSIX RTOS Profiles and Certification
  - Secure Mobile Architecture
  - Product Standards and Certification for:
    - SCADA – Smart Grid
    - Medical Devices
    - Consumer Electronics
    - Intelligent Transportation Systems
- **Liaisons/Affiliations:**
  - The Object Management Group
  - IEEE PASC SSWG RT
  - Society of Automotive Engineers
  - NATO Research Task Group on Validation, Verification and Certification of Embedded Systems
  - INCITS CS1
  - US Army COE
  - Navy PEO (IWS) – Open Architecture
  - Process Control Systems Cyber Security Forum
  - ARINC 653 APEX Working Group
  - Association for Enterprise Integrators
  - High Confidence Medical Device Software and Systems Workshop
  - DHS Software Assurance Working Group
  - Network Centric Operations Industry Consortium
  - Center for Advanced Defense Studies
  - OMG SwA Working Group

RTES Forum Members

Current as of 20 October 2012

- AIM
- Aonix
- Architecting-the-Enterprise
- AXE, Inc
- Capgemini S A
- Carnegie Mellon University, Software Engineering Institute
- City University (London)
- Danish Ministry of Science Technology & Innovation
- DDC-I, Inc
- US Department of the Navy
- eFlow
- eValley Inc
- Finite State Machine Labs
- Florida State University
- Fujitsu Limited
- Forschungszentrum Informatik
- Georgia Institute of Technology
- Green Hills
- IBM Corporation
- JAXA
- Kestrel Technology
- Kingdee
- Lockheed Martin Corp.
- LynuxWorks Inc.
- MIT, Embedded Systems Lab
- NASA Goddard Space Flight Center
- Objective Interface Systems
- DUSD/AT&L
- Ohio University
- QNX
- Pryrrhus software
- Raytheon
- REGIS
- Real-time Innovations
- Sony CSL
- Teamcall Ltd.
- The Boeing Company
- The Mitre Corp.
- Universidad de Cantabria (Spain)
- University of Idaho
- University of Nagoya
- University of Tokyo
- University of York (UK)
- Verocel, Inc
- Wind River

Real-time and Embedded Systems Forum Progress

Item	2007	2008	2009	2010	2011	2012	POC
Work In-process							
Standards for the Mils™ Architecture							
Requirements	**Review**	**Finalize**					Rance DeLong
APIs	**Initial**	**Review**	**Review**	**Review**	Review	**Finalize**	Joe Wlad
Evaluation & Certification Program			**Initial**	**Review**	**Review**	**Finalize**	Rance DeLong
Composability Business Scenario		**Finalize**					John Rushby
Component level specification			**Initial**	**Review**	**Review**	**Finalize**	Rance DeLong
High Assurance Procurement							
Managers Guide – what it is, how to use it		**Initial**	**Review**	**Review**	**Review**	**Finalize**	Michael McEvilley Edwin Lee
Procurement Guide – what should be in RFI		**Initial**	**Review**	**Review**	**Finalize**		Glen Logan
Dependability through Assuredness™							
Requirements		**Finalize**					Edwin Lee Glen Logan
Dependability Guide			**Initial**	**Review**	**Review**	**Finalize**	Edwin Lee
Architecting to the Edge™							
OSA Guide – Requirements	**Initial**	**Finalize**					Edwin Lee Glen Logan
OSA Pocket Guide			**Initial**	**Review**	**Review**	**Finalize**	Edwin Lee
Safety Critical Java – JSR 302							
Specification	**On-going**	**On-going**	**On-going**	**Finalize**	**Release**	**Update**	Doug Locke

Safety Critical on-going standards/project activity in The Open Group Real-time and Embedded Systems Forum

JSR-302: SC Java Current Summary

- Safety Critical Application: Mission, optionally restartable, statically analyzable:

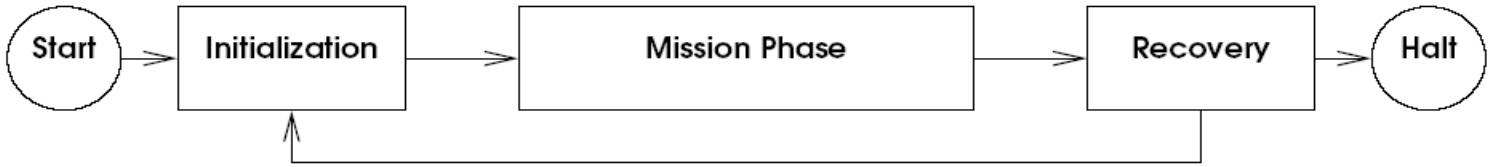


Figure 3.1: Safety Critical Execution Phases

- Simple application and infrastructure model
- No Garbage Collector, no reflection, no finalizers, no heap memory
- Three Compliance Points (Levels 0, 1, 2)
  - Level 0 provides a cyclic executive (single thread), no wait/notify
  - Level 1 provides a single mission with multiple schedulable objects,
  - Level 2 provides nested missions with (limited) nested scopes
- Specification writing completed
- Initial specification 2Q 2011 – Final Specification 1Q 2012
- Reference Implementation being implemented as open source RTSJ-compliant Java executable on any RTSJ-compliant JVM
- Two companies have built product based on JSR 302 – Aicas and Atego
  - http://www.aicas.com
  - http://www.atego.com/products/aonix-perc-raven/

EC Projects Related to Safety Critical

- Current projects -- Composition with Guarantees for High-integrity Embedded Software Components Assembly (includes Multicore)
  - JEOPARD
  - CHESS
  - CHARTER
- New EC Opportunities
  - Framework Programme for ICT – Provides funding for many technology areas
    - Networking
    - Cloud Computing
    - Security and Trust
    - Identity Management
    - Smart Grid
    - Cognitive Systems
    - Robotics
    - Smart components
    - Nano technologies
    - Etc..

On The Horizon

- Independent Evaluation and Certification Scheme for High Assurance COTS Security Components and Systems to include International Mutual Recognition
- An Open Group “Mils™” Brand
- Complete a Tool Chain for “TOGAF to the Platform” activity to ensure “Dependability through Assuredness™”
- Additional Java Specification Requirements (JSRs) to include Multicore and Security
- Multicore Standard APIs – to be submitted to IEEE PASC
- Assurance Cases/Templates/Patterns WG
- Mils™ Development Practices Working Group WG
- Planning to Respond to an 1Q 2012 Call for Proposals from the EC Under Framework 7 for a High Assurance Security Framework

Contact Information

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