

IEEE COMMUNICATIONS SOCIETY

OVERVIEW, ISSUES & NEXT STEPS

IEEE P1917.1 Working Group:

Standards for Software Defined Networking and
Network Functions Virtualization Reliability

**Presentation to the IEEE 2017 Emerging
Technologies Reliability Roundtable (ETR-RT)**

Bologna, Italy

3 July 2017



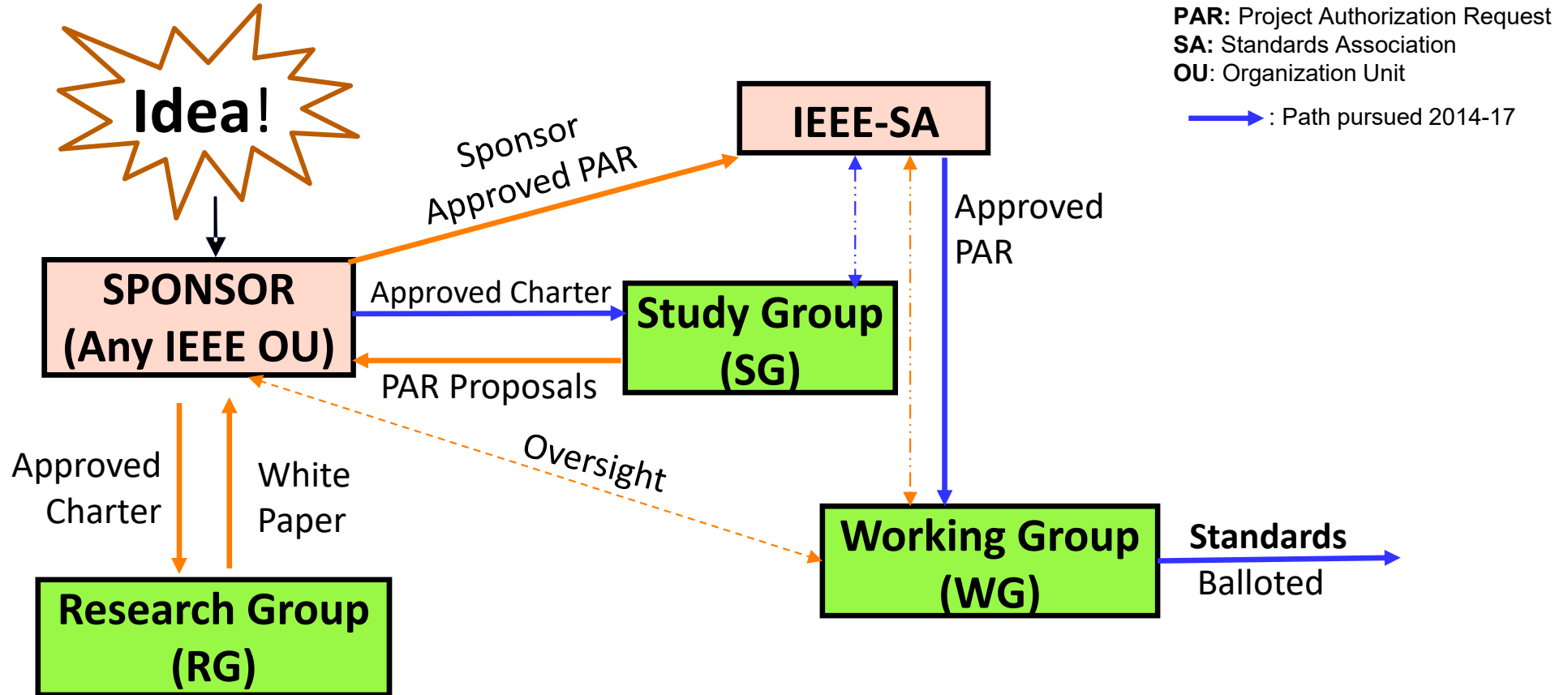
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Outline

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IEEE Standardization Process - Overview



Research Group (RG) - formed when *enough* interest has been identified in a particular area of study

Study Group (SG) - formed when *substantial* interest has been identified in a particular area of study

Working Group (WG) - formed when *mature* interests and key stakeholders' interests have been identified

*Source: "Software Defined & Virtualized Ecosystem", M. Ulema, ETSI 18th Global Standards Collaboration** (GSC-18) Meeting, 22-23 July 2014, Sophia Antipolis, France

Background Information - 1

IEEE Communications Quality & Reliability (CQR) Emerging Technology Reliability Roundtable* (Tucson, Arizona – May 12, 2014)

Outcome:

- Unanimous agreement to issue a Call For Participation (CFP) for a new IEEE Study Group (a.k.a. the SRPSDVE Study Group)
- Maintain momentum on Emerging Technologies (SDN, NFV, etc.) by avoiding a protracted Standards effort

SRPSDVE: Security, Reliability, and Performance for Software Defined and Virtualized Ecosystems

Background Information - 2

The IEEE SRPSDVE Study Group (SG) was formed in August 2014* (Spilios Makris, Chair)

http://grouper.ieee.org/groups/srpsdv/meeting_information.html

Outcome:

- Used this SG's contributions to achieve a consensus in issuing a Project Authorization Request - PAR (Sept. 2015) to the IEEE Communications Society Standards Development Board (COM/SDB) for the formation of three (3) new SDN/NFV Working Groups
- IEEE created 3 new Standards projects (P1915.1, P1916.1, and P1917.1 WGs) on SDN/NFV Security, Performance & Reliability

P1917.1 Project Authorization Request

- **Scope:** This standard specifies reliability framework, models, analytics, and requirements for Software Defined Networking and Network Functions Virtualization (SDN/NFV).
- **Purpose:** This standard provides a framework to build and operate SDN/NFV service delivery infrastructure that satisfies reliability expectations of network operators, service/content providers, and end users.
- **Need for the Project:** This standard addresses reliability models, terminology, and analytics to enable optimized system operations and service delivery in SDN/NFV infrastructures.
- **Additional Explanatory Notes:** Since SDN/NFV attracts a lot of attention, many Standards bodies and industry associations may undertake work in this area. Thus, a formal liaison with the ETSI NFV and others Standards Developing Organizations (SDOs) such as IETF, ITU-T, Open Network Forum (ONF) working on SDN/NFV issues may be needed to avoid any overlap or collisions.

P1917.1 WG: Leadership

- **Chair: Jason W. Rupe (Tenica)**

jrupe@ieee.org

- **Vice Chair: Peter Thermos (Palindrome Technologies)**

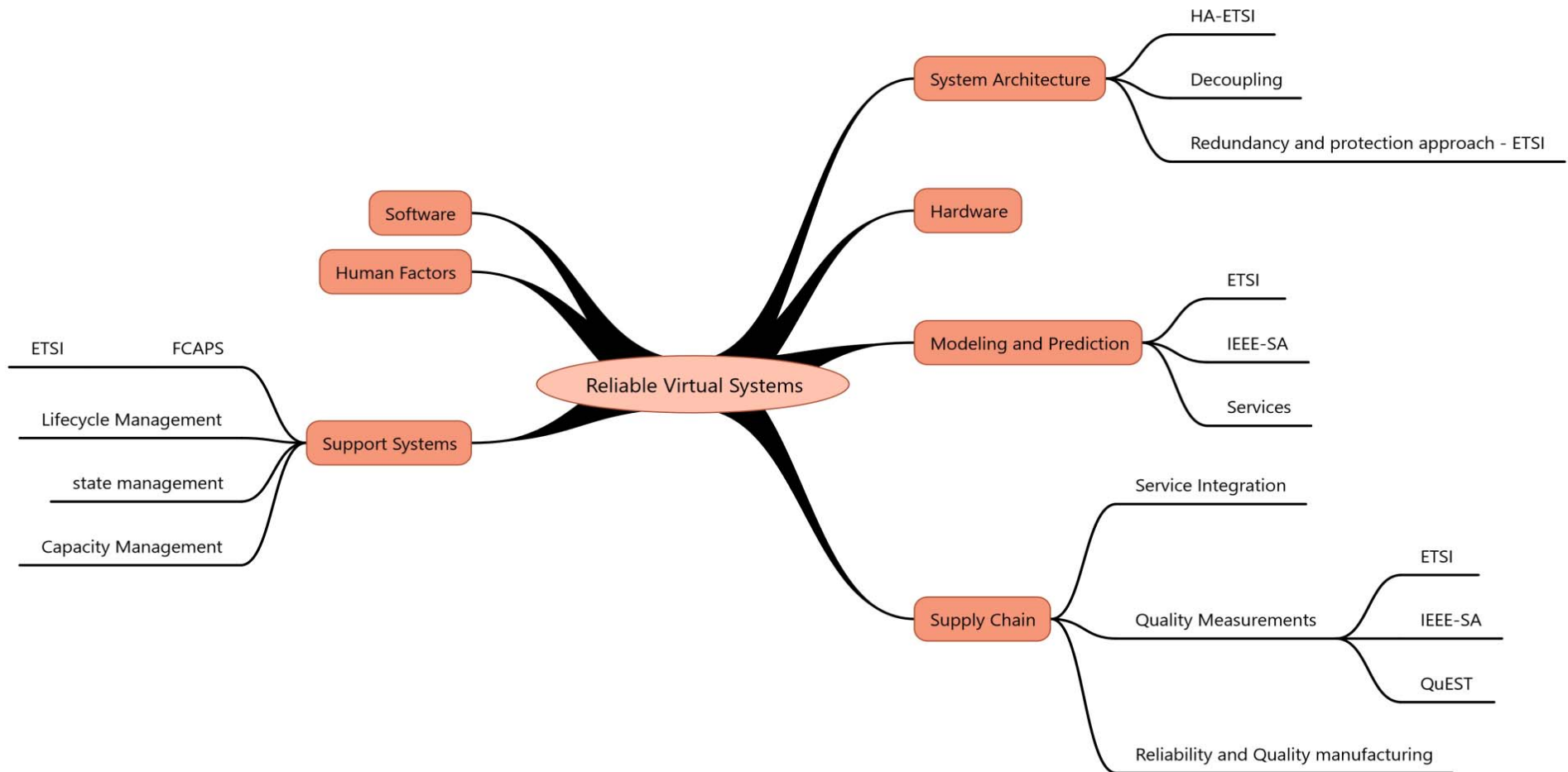
peter.thermosasadch@ipalindrometech.com

Challenges

- **Introduction of SDN/NFV in Service Providers Networks**
 - Arise questions concerning the network/system reliability, which can be particularly vexing because these technologies:
 - Are not simply an evolution of existing ones, but
 - Are an extensive replacement of the familiar with the unproven
- **Too many Standards Developing Organizations (SDOs) are involved regarding the SDN/NFV technologies**
 - Understand the many distributed and potentially complementary industry initiatives
 - Expect many overlaps
 - Avoid duplicate efforts

Is any coordination between the IEEE 1917.1 WG and other SDOs possible?

P1917.1 WG: Mindmap of Potential Work Areas and Liaisons



FCAPS: Fault, Configuration, Accounting, Performance, Security (ISO Telecom Management Network model & framework for network management)

QuEST: Quality Excellence for Suppliers of Telecommunications; **HA:** High Availability; **SA:** Standards Association

P1917.1 WG: Approach

- Follow-up on liaisons among other SDOs to get the status on outstanding SDN/NFV reliability issues
- Perform a gap analysis of the worldwide work on SDN/NFV reliability with the goal to answer the question:

“Which aspects of that work could be taken to the P1917.1 WG for standardization?”

- Demonstrate and document the steps necessary to establish an IEEE standardization presence in the SDN/NFV reliability topic

Hot Issues Debated: Example

■ Set of Definitions

- **Issue:** Review reference definitions that other SDOs have created and decide what are the right ones that IEEE P1917.1 WG could adopt or modify
 - Example definitions:
 - Virtual system
 - Virtual component
 - Virtual resource
 - Decoupled system
 - Decoupled component
 - Etc.
- **Challenge:** These definitions have been defined in other SDOs after long debates and may be an overlap or collisions with definitions created at this WG
- **Resolution:** Since service providers and suppliers already comply with the definitions of other SDOs, we should not pursue such efforts at this WG

P1917.1 WG: Current Efforts

- **End-to-end view of reliability for virtualized systems**
- **Reliability allocation models for virtual systems to ensure services**
- **Comparison of reliability methods for decoupled systems replacing legacy-coupled systems**
- **Framework to ensure reliability of applications in an SDN/NFV environment**

P1917.1 WG: Other Proposed Efforts under Consideration

- 1) Summarize, rationalize, and, where necessary, develop service reliability requirements for the services that a typical Service Provider offers using an SDN/NFV Service Delivery Infrastructure (SDI)
- 2) Develop generic methods to align Service Level Agreements (SLAs) with the service reliability/availability metrics
 - Current SLAs are rich in QoS attributes not in reliability/availability ones
- 3) Develop SLA templates focusing on service reliability/availability for an SDN/NFV SDI
 - A guide to help users and service providers prepare meaningful SLAs using service reliability/availability metrics
- 4) Develop models needed to connect the reliability of the physical and software assets in the SDN/NFV implementation with the reliability of typical Service Provider services provided on an SDN/NFV SDI

Next Steps / Actions

- Enhance P1917.1 WG participation by soliciting SMEs from telecom companies around the world (via networking or conference presentations)
- Pursue the WG “Mindmap” of potential work areas
- Have a dialogue about the other proposed efforts for the WG
- Agree on the reliability-related areas/issues that could be realistically addressed at this WG
- Liaise with other SDOs (e.g., ETSI, QuEST, etc.)

SME: Subject Matter Expert

SDO: Standards Developing Organization

QuEST: Quality Excellence for Suppliers of Telecommunications