

IEEE COMMUNICATIONS SOCIETY

**STUDY GROUP
FOR
SECURITY, RELIABILITY, AND PERFORMANCE
FOR SOFTWARE DEFINED AND VIRTUALIZED ECOSYSTEMS
(SRPSDVE)**

Kick-off Meeting via Teleconference

August 18, 2014



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Study Group Kick-off Meeting Agenda

- **Call to Order**
- **Introduction of Participants**
- **Review Study Group's Goals and Approach**
- **Background Information regarding the Formation of this Study Group**
- **Open Discussion – Q & A**
- **Next Steps / Action**
- **Future Meetings**
- **Adjourn**

Introduction of Participants

- **Your Name**
- **Company Name / Affiliation**
- **Area(s) of Expertise**
 - Security
 - Reliability
 - Performance
- **Standards-related Experience**
 - Present / Past

IEEE STANDARDS ASSOCIATION

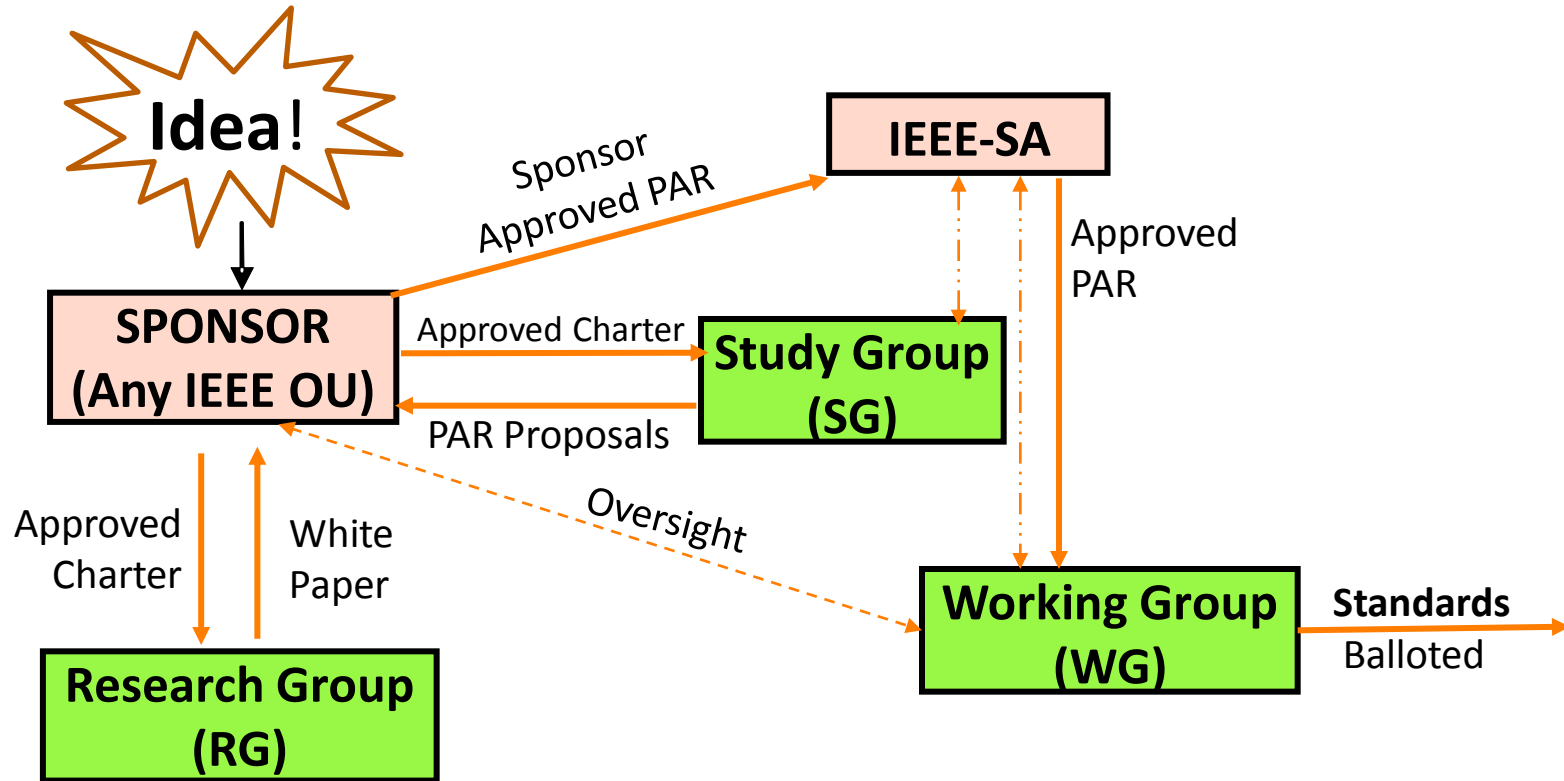
Call for Participation for a NEW Study Group on Security, Reliability, and Performance for Software Defined and Virtualized Ecosystems

IEEE Standards Association (IEEE-SA) announces a Call for Participation in the IEEE Study Group for Security, Reliability, and Performance for Software Defined and Virtualized Ecosystems (SRPSDVE).

Scope and Purpose

The objective of this Study Group (SG) is to identify primary standards development opportunities in the security, reliability, and performance aspects of the SDN, NFV, NGSON, and related areas.

IEEE Standardization Process



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

Formation of an IEEE Study Group

- *A Study Group (SG) is formed when enough interest has been identified in a particular area of study. Formation and operation of the Study Group is governed by an approved IEEE-SA Standards Sponsor, e.g. the ComSoc Standards Development Board or a ComSoc Standards Committee. A SG work typically continues for 3-6 months with the objective of drafting a Project Authorization Request (PAR) for consideration by the Sponsor. The PAR outlines the scope of the standards development project. If the PAR is approved, the SG is disbanded and a Working Group (WG) is formed to carry out the standardization process within the scope authorized in the approved PAR. A SG is a formal entity whose activities are governed by the Policies and Procedures of the Sponsor:*
<http://www.comsoc.org/files/About%20Comsoc/Documents/Policies%20and%20Procedures/flip/ComSoc%20Standards%20Development%20Board%20Policies%20and%20Procedures/HTML/index.html#>
- *Guidelines related to formation and operation of a study group can be found here:*
<http://standards.ieee.org/develop/corpchan/studygrp.pdf>

Study Group Participants' Affiliation*

Amdocs
Assured Networks
AT&T
Boeing
Catapult Consultants
Ciena
COSMOTE
Create-Net
CUNY
Emerson Climate Technologies
Ericsson
Fluke Networks
Gilat Satellite Networks Ltd
GSU
Huawei
Illinois Institute of Technology
Intel Corp.
KerrNet Consulting
Llamastam Consulting
Lockheed Martin
Manhattan College
McGill Univ./Jewish Gen. Hospital
MITRE Corp.
National Chiao Tung University, China
OGCIO, Hong Kong
Orange
OTE
Palindrome Technologies
Politecnico di Milano. Italy
QuEST Forum
Rockwell Automation
RTI International
Palindrome Technologies, USA
Secure Computing Innovation Foundation
Software Reliability Research
SUNY at Buffalo
SYSREL
The Nemacolin Group
Unb
Uniandes
University of Maryland
University Putra, Malaysia
UW Madison

Study Group's Goals

- **Assess whether there is an opportunity for the IEEE, under Communications Society (ComSoc) sponsorship, to launch a standardization activity regarding the security, reliability, and performance aspects of the:**
 - **Software Defined Networking (SDN)**
 - **Network Functions Virtualization (NFV)**
 - **Next Generation Service Overlay Network (NGSON), and**
 - **Related areas**
- **Prepare a Project Authorization Request (PAR) to launch the official standardization process (if consensus is reached)**

IEEE Project Authorization Request (PAR) Example Outline

1.1 Project Number:

1.2 Type of Document:

1.3 Life Cycle:

2.1 Title:

3.1 Working Group:

3.2 Sponsoring Society and Committee:

4.1 Type of Ballot:

4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot:

4.3 Projected Completion Date for Submittal to RevCom:

5.1 Approximate number of people expected to be actively involved in the development of this project:

5.2.a. Scope of the complete standard:

5.2.b. Scope of the project:

5.3 Is the completion of this standard dependent upon the completion of another standard:

5.4 Purpose:

5.5 Need for the Project:

5.6 Stakeholders for the Standard:

6.0. Intellectual Property:

7.1 Are there other standards or projects with a similar scope?

7.2 Joint Development: Is it the intent to develop this document jointly with another organization?

8.1 Additional Explanatory Notes (Item Number and Explanation):

Study Group's Approach

The approach to be taken will include the following:

- **Demonstrate and document the steps necessary to establish an early standardization presence in the security, reliability, and performance topics**
- **Perform a "gap" analysis for each topic to determine standardization opportunities in SDN, NFV, and related areas**

Background Information

- **IEEE Software Defined Ecosystem Standards Working Meeting (April 25, 2014)**
- **IEEE CQR Roundtable on Emerging Technologies (May 12, 2014)**
- **IEEE Call For Participation – CFP (July 21, 2014)**
 - IEEE Communications Society
 - IEEE Reliability Society
 - IEEE Computer Society
- **“Word of mouth” among colleagues (on-going)**

IEEE Standards Activities on Software Defined and Virtualized Ecosystem

- “Rapid Reaction Standardization Research Team” meeting held on April 25, 2014
- 16 attendees from 7 companies and 2 universities
- AT&T, Verizon, NTT DoCoMo, AlcaLu, Huawei showed large company participation
- India, Israel, Italy, Japan, US were represented
- 17 gap items identified, 4 groups formed:
 - **Study Group (SG) on Security, Reliability and Performance for Software Defined and Virtualized Ecosystems**
 - Research Group (RG) on Software Defined and Virtualized Wireless Access
 - Research Group (RG) on Structured Abstractions
 - Study Group (SG) on Service Virtualization

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

** <http://www.atis.org/PRESS/pressreleases2014/072814.asp>

IEEE Software Defined Ecosystem Standards Working Meeting* (1)

(Newark, New Jersey – April 25, 2014)

- **Objective:** Identify primary standards development opportunities in SDN/NFV** and related areas
- **Approach:** Demonstrate and document the steps necessary to establish an early industry presence in these key areas of opportunity
- **Outcome:**
 - Specific tasks were identified (see next viewgraph)
 - Unanimous agreement to issue a Call For Participation (CFP) for a new IEEE Study Group (a.k.a. this SRPSDVE Study Group)

* Source: “Meeting Report of IEEE Software Defined Ecosystem Standards Working Meeting”, M. Ulema, May 2, 2014

* **SDN: Software Defined Networking; NFV: Network Functions Virtualization

IEEE Software Defined Ecosystem Standards Working Meeting (2) (Newark, New Jersey – April 25, 2014)

- **Specific tasks identified for the security, reliability, and performance of SDN/NFV**
 - Review other standards activities like: ETSI NFV, ONF, 3GPP, ATIS (TOPS), IETF, ITU-T, ATIS (PRQC), NIST, OMG (SDN)
 - Identify the overlaps
 - Perform a gap analysis for the security, reliability, performance topics
 - Prioritize potential tasks based on the gap analysis
 - Develop a roadmap to address the gaps
 - Define the scope and framework
 - Transition to standardization
 - Address issues, requirements, use-cases

IEEE Software Defined Ecosystem Standards Working Meeting (3) (Newark, New Jersey – April 25, 2014)

■ Specific tasks identified (Cont.)

- **Recruit contributors**
- **Framework Details**
 - **Priority Class-of-Service virtualization: Intersection of reliability, security, and performance circles**
 - **Use-case & application driven; regulated industry**
 - **Metrics**
 - **Security: Key Performance Indicators - KPIs**
 - **Performance: QoS (Network, Global Open Ethernet, minimum between guarantees)**
 - **Reliability: Availability, Mean-Time-To-Restore (MTTR)**
 - **Predictability**

IEEE Communications Quality & Reliability (CQR) Emerging Technology Reliability Roundtable* (1) (Tucson, Arizona – May 12, 2014)

Scope:

- Discuss and identify the RAS (Reliability, Availability, and Serviceability) challenges, requirements, and methodologies in the emerging technology areas like the:
 - Cloud Computing
 - Wireless/Mobility
 - NFV (Network Functions Virtualization)
 - SDN (Software Defined Networking)
 - Similar large-scale distributed and virtualization systems
- Discuss the RAS requirements and technologies for mission-critical industries with the goal to promote the inter-industry sharing of related ideas and experiences
- Identify potential directions for resolving identified issues and propose possible solutions

Outcome:

- Unanimous agreement to issue a Call For Participation (CFP) for a new IEEE Study Group (a.k.a. this SRPSDVE Study Group)

IEEE Communications Quality & Reliability (CQR) Emerging Technology Reliability Roundtable* (2) (Tucson, Arizona – May 12, 2014)

Industry Challenges:

- Lack of industry consistency for reliability analysis or benchmarks of ET-based networks
- Need for network providers to know if what they are building will deliver the service reliability/performance required by end users
- Service providers specify service availability within own network domains; end-user services delivered across multiple domains are virtually impossible to guarantee
- Best-in-class reliability/availability SLAs while minimizing the cost of operations and maintenance
- Coordination of efforts in different Standards Developing Organizations (SDOs) like IEEE, ATIS, ITU-T, ETSI, etc. and government-sponsored activities (e.g., CSRIC in USA)

***Maintain momentum on Emerging Technologies (SDN, NFV, etc.)
by avoiding a protracted Standards effort***

Challenges & Hot Issues Debated

- **The area is “hot” now!**
 - Is it a hype or here to stay?
 - What are the synergies between SDN and NFV?
- **Too many SDOs involved**
 - Understand the many distributed and potentially complementary industry initiatives
 - Many overlaps are expected
 - Is any coordination possible?
- **Realizing SDN and NFV specifications & requirements!**
 - Avoid duplicate efforts
 - Pursue a fast-track development

SDN/NFV Work Worldwide: Partial List

- **ONF – Open Flow**
- **NIST – Cloud Computing**
- **ETSI – NFV**
- **IETF/IRTF – SDrN, SDNP, SDN RG**
- **Ericsson – Service Provider SDN**
- **OMA – Device Mgmt 2.0**
- **IEEE P1903 (NGSON)**
- **3GPP**
- **OMG (SDN)**
- **SDR (Software Defined Radio) Forum**
- **Stanford University – Programmable Open Mobile Internet (POMI)**
- **Ohio State University – Software Defined Antenna**

*Source: Niranth Amogh “Software Defined-ness in Networks (SDN)”,
Software Defined Ecosystem Standards Working Meeting”,
Newark, NJ, April 25, 2014

IEEE Strategic Direction

■ **Fact:**

- **SDN, NFV and related areas have been identified as one of IEEE's future directions**

■ **Action:**

- **Significantly increase the IEEE standardization activities in this areas within the existing projects and with new projects**
- **Establish liaisons with other Standards Developing Organizations (SDOs) working on this area**

Current Standardization Efforts on SDN*

Examples

- **IETF Forwarding and Control Element Separation (ForCES) Working Group**
- **Open Network Foundation**
 - Pushing OpenFlow
 - Interfaces between:
 1. Applications and controller and
 2. Controller and switching infrastructure
- **ITU-T SG13 (Future Networks) and SG11 (SDN signaling)**
- **IRTF Software Defined Networking Research Group**
- **ETSI SDN/NFV**

*Source: F. Granelli "SDN – Possible Standardization Opportunities",
Software Defined Ecosystem Standards Working Meeting",
Newark, NJ, April 25, 2014

NFV: Gaps for Standardization* Example of where new standardization is required

Topology Validation:

- Liaison with ONF requesting state of the art in SDN security problems and solutions.
- Liaison with ONF Security Discussion Group to cooperate on NFV-SDN interworking for topology validation.

Availability of Management Support Infrastructure:

- Document required NFV-related updates and issue necessary liaison requests to the relevant SDO(s).

Secure Boot:

- Liaison with Trusted Computing Group to establish maturity of solutions at the likely scale required for NFV, through reference deployments.

Performance Isolation:

- If state of the art research proves sufficient when evaluated, issue liaison requests to the relevant SDO(s) to standardise.

Back-doors via virtualised Test Functions:

- Check whether there is an existing standard (e.g. ISO) that gives guidance on securing test interfaces in operational systems. Otherwise consider where such best practice should be documented.

Discussion

- **Questions and Answers (Q&As) on:**
 - **The SRPSDVE Study Group**
 - **The three specific topics**
 - **Security**
 - **Reliability**
 - **Performance**

Next Steps / Actions

- **Organize Study Group's future meetings based on the attendees' background/affiliation and area of expertise (e.g., security, reliability and performance)**
- **Appoint three (3) Vice-Chairs of the SRPSDVE Study Group for the Security, Reliability, and Performance topics respectively (please express your interest via an email to the SG Chair along with a short bio by September 10, 2014)**
- **Upload participants' contributions to achieve a consensus regarding the issue or not of a PAR to address the standardization of SDN, NFV and related areas focusing on Security, Reliability, and Performance topics**
- **Recruit more members from Service Providers and the industry to meet the goals and objectives of this SG within the specified timeframe (approx. 6 months)**

Future Meetings

- **Type of meetings and frequency**
 - **Face-to-face (1-2 days) with teleconference option**
 - At IEEE Headquarters in Piscataway, NJ (October 2014)
 - At GLOBECOM 2014 in Austin, TX (December 2014)
<http://www.ieee-globecom.org/>
 - At a sponsor's location to be decided (If needed, in March 2015)

(Details will follow)