IEEE COMMUNICATIONS SOCIETY

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

Face-to-face Meeting (& via Teleconference)

October 29, 2014

Spilios Makris (Chair)
Palindrome Technologies

Study Group Meeting Agenda

- Call to Order
- Introduction of Participants
- Introduction of the Study Group three Vice Chairs
- Contribution Readout based on Presenter's Time Zone (China/India first)
- Discussion on how these contributions could be used in writing the expected Study Group deliverable (i.e., a PAR to address the standardization of SDN, NFV regarding specific security, reliability, and performance related topics)
- Open Discussion – Q & A
- Next Steps / Action Items
- Future Meetings
- Adjourn

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Study Group Meeting Agenda – Timeline
EDT (New York Time)

- 8:30 – 9:00 Introduction, Objective, Background
- 9:00 – 12:00 Individual presentations about specific ideas for standardization
- 12:00 – 1:00 Lunch
- 1:00 – 3:00 Identification of standardization opportunities
- 3:00 – 3:15 Coffee break
- 3:15 – 3:45 Follow-up items for the December 2014 face-to-face meeting (and via teleconference) during Globecom2014
- 3:45 – 4:00 Meeting wrap-up and closing

Introduction of Participants

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

Introduction of the SG Vice Chairs

- **Security:**
  - **Ashutosh Dutta (AT&T)**

    ashutosh.dutta@att.com
- **Reliability:**
  - **Chandru Mirchandani (Lockheed Martin)**

    chandru.j.mirchandani@lmco.com
- **Performance:**
  - **Mohammad Asad Chaudhry (Univ. of Toronto)**

    masadch@ieee.org

Study Group Participants' Affiliation*

1. ABB, India
2. AGH Univ. of Science & Technology, Poland
3. Alcatel-Lucent
4. Amdocs
5. Assured Networks
6. AT&T
7. Boeing
8. Brocade
9. Budapest Univ. of Technology, Hungary
10. CAIR DRDO, India
11. Catapult Consultants
12. Ciena
13. Cisco
14. CMRIT, India
15. COSMOTE, Greece
16. Create-Net, Italy
17. CUNY
18. Emerson Climate Technologies
19. Ericsson
20. Fluke Networks
21. Gilat Satellite Networks
22. GIT, India
23. GSU
24. Huawei, China & India
25. IBM
26. Illinois Institute of Technology
27. Indian Institute of Technology, India
28. Infosys
29. Intel Corp.
30. John Hopkins University
31. Juniper Networks
32. KerrNet Consulting, Canada
33. Llamastam Consulting, India
34. 34 Lockheed Martin
35. Manhattan College
36. Manipal Institute of Technology, India
37. McGill Univ./Jewish Gen. Hospital, Canada
38. MITRE Corp.
39. Nakina Systems of Ottawa, Canada
40. National Chiao Tung University, China
41. OGCIO, Hong Kong
42. Oracle
43. Orange
44. OTE, Greece
45. Palindrome Technologies
46. PESIT, India
47. Politecnico di Milano, Italy
48. QuEST Forum
49. Rockwell Automation
50. RTI International
51. Rutgers University
52. Palindrome Technologies
53. Sasken Communication Technologies
54. Secure Computing Innovation Foundation
55. Sensus Metering System
56. Software Reliability Research LCC
57. SUNY at Buffalo
58. SYSREL
59. Tangentix, England
60. TCS , India
61. The Nemacolin Group
62. Unb
63. Uniandes
64. University of Maryland
65. University Putra, Malaysia
66. University of Wisconsin at Madison
67. UTL
68. Wipro

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*Snapshot as of October 28, 2014

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List of Uploaded Contributions per Topic

- **Overview**
  - **Spilios Makris** (Chair)
  - **Mohammad Assad Chaudhry** (Vice Chair, Performance)
  - **Niranth Amogh** (Huawei, India)
- **Security**
  - **Ashutosh Dutta** (AT&T)
  - **John Kimmins** (Catapult Consultants)
  - **W. Fred Seigneur** (Secure Computing Innovation Foundation)
- **Reliability**
  - **Chandru Mirchandani** (Lockheed Martin)
  - **Abhilash Gopalakrishnan** (ABB India Development Center)
  - **Rob Paterson** (KerrNet Consulting)
  - **Mike Tortorella** (Rutgers Univ.)
- **Performance**
  - **Mohammad Assad Chaudhry** (Univ. of Toronto)

SDN/NFV Work Worldwide: Partial List

- ONF – Open Flow
- ITU-T (FG Future Networks, SG13)
- NIST – Cloud Computing
- ETSI – NFV
- ATIS – NFV Forum
- 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

SDN/NFV: Gaps for Standardization*- 1

Examples of where standardization in SDN/NFV Security 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.

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*Source: Network Functions Virtualisation (NFV); NFV Security: Problem Statement, Draft ETSI GS NFV-SEC 001 V0.0.9 (2014-01)

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SDN/NFV: Gaps for Standardization*- 2

Examples of where standardization in SDN/NFV Reliability is required

- Level of Resilience
  - N+1, or N+x
- Five 9's vs. Three 9's
  - Cost vs. Need for Reliability
- Use Cases
  - Data Center vs. Mobile
- Key Performance Indicators (KPIs)
- Hot Swap
  - E.g., Protocol for Hot Swap of two SDN Controllers
- Balance in Provision of Reliability
  - Hardware vs. Software
- Layered vs. Cross-layered

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*Source: Mohammad Asad Chaudhry, SRPSDVE Study Group Vice Chair, Univ. of Toronto

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What is Needed?

- **Follow-up on liaisons among other Standards Developing Organizations (SDOs) to get the latest status on outstanding issues**
- **Perform a gap analysis of the SDN/NFV worldwide work on Security, Reliability, and Performance with the goal to answer the question:**

> **"Which aspects of that work could be taken forward in IEEE for standardization?"**

- **Use the above information to draft a PAR for ComSoc**

IEEE Study Group Objective

- *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*

Project Authorization Request (PAR) – 1
Example Outline

1. Type of Project / Project Number / Type of Document / Life Cycle
2. Title
3. Working Group (WG) Name / Contact Information for WG Leadership
4. Type of Ballot / Expected Dates of Submission and Completion
5. Scope
    - 5.1 Approximate # of people expected to be actively involved in this project
    - 5.2 Scope of Complete Standard / Scope of the Project
    - 5.3 Dependency on Another Standard
    - 5.4 Purpose
    - 5.5 Need for the Project
    - 5.6 Stakeholders for the Standard
6. Intellectual Property
7. Standards or Projects with a Similar Scope / Joint Development with other SDOs
8. Additional Explanatory Notes

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Project Authorization Request (PAR) – 2
Example Scope (Project No.: P802.15.3d)

5.2.a. Scope of the Complete Standard:

- This project will define the PHY and MAC specifications for high data rate wireless connectivity with fixed, portable and moving devices. Data rates will be high enough to satisfy a set of consumer multimedia industry needs, and to support emerging wireless switched point-to-point applications.

5.2.b. Scope of the Project:

- This amendment defines a wireless switched point-to-point physical layer to IEEE Std. 802.15.3 operating at a nominal PHY data rate 100 Gbps with fallbacks to lower data rates as needed. Operation is considered in bands from 60 GHz up to and including optical wireless at ranges as short as a few centimeters and up to several 100m. Additionally, modifications to the Medium Access Control (MAC) layer, needed to support this new physical layer, are defined.

Project Authorization Request (PAR) – 3
Example Purpose / Need (Project No.: P802.15.3d)

5.4 Purpose:

- The purpose is to provide a standard for low complexity, low cost, low power consumption, and high data rate wireless connectivity among devices. Data rates will be high enough to satisfy a set of consumer multimedia industry needs, and to support emerging wireless switched point-to-point applications in data centers, wireless backhaul/fronthaul intra-device communication and kiosk downloading.

5.5 Need for the Project:

- In data centers wireless links will make frequent reconfiguration easier and more cost-effective. In the case of backhaul and fronthaul, wireless solutions will reduce costs for the case when installing a fiber network is not cost-effective. In the cases of close-proximity kiosk-downloading and intra-device communication, a minimum data rate achievable with high probability, is required, which should be possible because of the operation in a controlled environment. No wireless standard with all these properties, operating at a primary data rate of 100 Gbps, with fallbacks to lower data rates as required and suitable for operation in a switched point-to-point-configuration exists today.

Discussion

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

Next Steps / Actions

- Solicit more contributions (with the help of the three Vice Chairs) from the Study Group participants based on their respective area of expertise (e.g., security, reliability, and performance) for the upcoming December SG meeting
- Use the contributions to achieve a consensus in issuing or not of a PAR to address the standardization of SDN, NFV and related areas focusing on Security, Reliability, and Performance topics
- Liaise with the leadership and Subject Matter Experts of other Standards Developing Organizations during the Globecom 2014 conference
- 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 day) with teleconference option**
    - **At GLOBECOM 2014 in Austin, Texas (December 2014)**

      http://www.ieee-globecom.org/
    - **At IEEE Headquarters in New Jersey or at a sponsor's location to be decided (If needed, in March 2015)**

(Details will follow)