



Welcome to the World of Standards



NFV TUTORIAL SESSION - Security

NFV#12

Monday 26th October, 12:30 – 14:00

Mike Bursell, SEC WG Vice-chair, Intel

The NFV SEC Working Group Mission



The NFV SEC Working Group comprises computer-, network-, and Cloud security experts—representing **network operators**, **equipment vendors**, and **law enforcement agencies**—who advise the NFV ISG on all matters of the relevant security technologies while developing a wide range of industry specifications that

- **Identify both** the NFV-specific security problems as well as the technological advantages of the NFV environment that can be harnessed to improve the security of the network operators' services;
- **Provide specific guidance** on various aspects of the NFV security in a systematic, holistic manner—building trust from secure hardware modules to software and covering identity management, authentication, authorization, and secure attestation, as well as the means of global monitoring of the whole NFV environment and decisive operational security actions in response to security breaches;
- **Address in minute detail** the security of the the present Open Source-based platforms (such as *OpenStack*) ;
- **Contribute to solving the problem** of implementing Lawful Interception in the NFV environment; and
- **Work in close collaboration** with other ETSI NFV WGs, PoCs, as well as external organizations (in particular, *ETSI TC Cyber*, *ETSI TC LI*, *Trusted Computing Group*, and contributing members of *OpenStack*)

- NFV presents unique opportunities for addressing security problems
- The SEC approach
 - Is anchored to platform security
 - Exploits new capabilities:
 - Automation and analytics
 - Hypervisor- or agent-enabled introspection
 - Holistic Monitoring combined with analytics
 - Provides global response to security events according to the network operators' policies (the new proposal for security 'orchestration')
- NFV can
 - Improve the security properties of network functions
 - Facilitate agile provision of secure services by the carrier
 - Provide better protection of the carrier cloud

Unsolved problem (so far): *Lawful Interception*

The ETSI NFV Security Working Group

(<https://portal.etsi.org/tb.aspx?tbid=799&SubTB=799>)



- Was created as an *expert group* in Phase 1 in 2012 with the **objective** to establish the *NFV security problem statement* and advise all working groups rather than have its individual work items (but that has changed!)
- **Started** by Bob Briscoe (BT)
 - with **three** experts at the onset of the NFV;
 - no communications beyond e-mail exchange
- **In Phase 2 SEC has grown to:**
 - A full working group (Chairman: I. Faynberg, Cable Labs; Vice Chairman: Mike Bursell, Intel)
 - Steady **18** active participants from **various** companies (**200** on the list, **25** at F2F meetings) and government agencies—regular weekly 2-hour long meetings, and a steady stream of contributions
 - Active joint work with ETSI TC Cyber, ETSI TC LI, Trusted Computing Group
 - **Eleven** work items (4 complete)

- Topology Validation and Enforcement
- Availability of Management Support Infrastructure
- Secured Boot
- Secure Crash
- Performance Isolation
- User/Tenant Authentication, Authorization, and Accounting
- Authenticated Time Service
- Private Keys within Cloned Images
- Back-doors via Virtualized Test and Monitoring Functions
- Multi-Administrator Isolation
- Security monitoring across multiple administrative domains (e.g. Retained Data, Lawful Interception)



Work Item	Rapporteur	
SEC001 "NFV Security problem statement"	Bob Briscoe, BT	Complete
SEC002 "Openstack security"	Huilan Lan, Alcatel-Lucent	Complete
SEC003 "NFV Security and Trust Guidelines"	Mike Bursell, Intel; Kurt Roemer, Citrix	Complete
SEC004 "LI report"	Scott Cadzow, Cadzow Limited	Complete
SEC005 "Certificate management report"	Marcus Wong, Huawei	
SEC006 "Security & regulation report"	Scott Cadzow, Cadzow Limited	
SEC007 "NFV Attestation report"	Diego Lopez, Telefonica	
SEC008 "Security monitoring report"	Ashutosh Dutta, AT&T; Kapil Sood, Intel	
SEC009 "Use cases for multi-layer host administration"	Mike Bursell, Intel	
SEC010 "NFV Retained data"	Mark Shepherd, Tencastle	
SEC011 "LI architecture report"	Alex Leadbeater, BT	