

NMRG Status Report '2012

Olivier Festor
INRIA Research Center, France

Lisandro Zambenedetti Granville
Federal University of Rio Grande do Sul, Brazil

84th IETF meeting in Vancouver

NMRG History and Statistics

- First unofficial meeting in Lausanne, November 1998
- Formally approved by the IAB in March 1999
- New co-chairs in March 2011
- 28 meetings at various places since formation
- Produced 5 NMRG RFCs
- Involved in 27 other publications by NMRG members
- Currently, 264 subscriptions on the mailing list

NMRG Business Model

- Collaboration and discussion forum
- Bridging gaps between academia, industry, operators, standards developing organizations (SDOs), ...
 - Improve mutual understanding
 - Participation of people from different SDOs to exchange viewpoints (ITU, CIM, W3C, IETF, ...)
- Interactive 1-2 day meetings
 - Usually co-located with other events
 - Hosted by a supporting institution (low cost)
 - E.g., last meeting at ICT Labs, Saturday after IETF 83
 - Presentations followed by intensive detailed discussions

NMRG Projects

- SNMP Evolution (RFC 3430)
- Terminology (RFC 3444)
- SMIng (RFC 3780, RFC 3781)
- Performance of Web Services for Management
- SNMP measurements and trace formats (RFC 5345)
- Management visualization
- NETCONF for constrained devices
- Retrieving knowledge out of NETFLOW/IPFIX flows

Research Challenges

- Software Defined Network (SDN) management
- Autonomic management
- Network-wide safe configuration
- Large-scale network-wide measurements
- Management of virtual network environments (VNEs)
- Management of the Internet of Things (IoT)
- Energy monitoring and management

NMRG Present & Future

- From March 2011
 - Migration of the NMRG website and mailing list to the IETF's Wiki and mailman
 - 2 meetings (IETF 81 - Quebec and IETF 83 - Paris)

- Challenges:
 - High energy at meetings, but still few movements afterwards
 - Materialize discussions and advancements into IRTF documents

- Work on key research challenges
 - NETFLOW/IPFIX topics has been quite successful (4 meetings)
 - Autonomics and self-management (explosion on the number of managed objects due to network virtualization)
 - Management of complex network environments such as IoT, SDN, cloud datacenter networks, ...

Discussion

References I

1. V. Bajpai, N. Melnikov, A. Sehgal, Schönwälder. **Flow-based Identification of Failures Caused by IPv6 Transition Mechanisms.** 6th Conference on Autonomous Infrastructure, Management and Security (AIMS), June 2012.
2. J. Schönwälder, V. Marinov. **On the Impact of Security Protocols on the Performance of SNMP.** IEEE Transactions on Network and Service Management, April 2011.
3. A. Sperotto, A. Pras. **Flow-Based Intrusion Detection.** 12th IFIP/IEEE International Symposium on Integrated Network Management (IM), May 2011.
4. M. Carvalho, L. Z. Granville. **Incorporating Virtualization Awareness in Service Monitoring Systems.** 12th IFIP/IEEE International Symposium on Integrated Network Management (IM), May 2011.
5. C. R. P. Santos, R. S. Bezerra, J. M. Ceron, L. Z. Granville, L. M. R. Tarouco. **On Using Mashups for Composing Network Management Applications.** IEEE Communications Magazine, December 2010.
6. P. Barbosa, L. Z. Granville. **Interactive SNMP Traffic Analysis Through Information Visualization.** IEEE/IFIP Network Operations and Management Symposium (NOMS), April 2010.

References II

7. A. Pras, R. Sadre, A. Sperotto, T. Fioreze, D. Hausheer, J. Schönwälder. **Using NetFlow/IPFIX for Network Management.** Journal of Network and Systems Management, November 2009.
8. T. Fioreze, L. Z. Granville, A. Pras, A. Sperotto, R. Sadre. **Self-management of Hybrid Networks: can we trust NetFlow data?** 11th IFIP/IEEE International Symposium on Integrated Network Management (IM), June 2009.
9. J. Schönwälder. **Simple Network Management Protocol (SNMP) Traffic Measurements and Trace Exchange Formats.** RFC 5345, Jacobs University Bremen, October 2008.
10. A. Sperotto, R. Sadre, A. Pras. **Anomaly characterization in flow-based traffic time series.** 8th IEEE International Workshop on IP Operations and Management (IPOM), September 2008.
11. E. M. Salvador, L. Z. Granville. **Using Visualization Techniques for SNMP Traffic Analyses.** 13th IEEE Symposium on Computers and Communications (ISCC), July 2008.

References III

12. J. Schönwälder. **Protocol Independent Network Management Data Modeling Languages – Lessons Learned from the SMIng Project.** IEEE Communications Magazine, May 2008.
13. A. Pras, J. Schönwälder, M. Burgess, O. Festor, G. M. Pérez, R. Stadler, B. Stiller. **Key Research Challenges in Network Management.** IEEE Communications Magazine, October 2007.
14. J. Schönwälder, A. Pras, M. Harvan, J. Schippers, R. van de Meent. **SNMP Traffic Analysis: Approaches, Tools, and First Results.** 10th IFIP/IEEE International Symposium on Integrated Network Management (IM), May 2007.
15. J. Schönwälder. **Characterization of SNMP MIB Modules.** 9th IFIP/IEEE International Symposium on Integrated Network Management (IM), May 2005.
16. A. Pras, T. Drevers, R. van de Meent, and D. Quartel. **Comparing the Performance of SNMP and Web Services based Management.** IEEE electronic Transactions on Network and Service Management, November 2004.
17. T. Klie and F. Strauß. **Integrating SNMP agents with XML-based management systems.** IEEE Communications Magazine, July 2004.

References IV

18. G. Pavlou, P. Flegkas, S. Gouveris, A. Liotta. **On Management Technologies and the Potential of Web Services.** IEEE Communications Magazine, July 2004.
19. J. van Sloten, A. Pras, M. J. van Sinderen. **On the Standardisation of Web Service Management Operations.** 10th Open European Summer School (EUNICE 2004) and IFIP WG 6.3 Workshop, June 2004.
20. T. Drevers, R. van de Meent, A. Pras. **Prototyping Web Services based Network Monitoring.** 10th Open European Summer School (EUNICE 2004) and IFIP WG 6.3 Workshop, June 2004.
21. F. Strauß and J. Schönwälder. **Next Generation Structure of Management Information (SMIng) Mappings to the Simple Network Management Protocol (SNMP).** RFC 3781, TU Braunschweig, IU Bremen, May 2004.
22. J. P. Martin-Flatin, D. Srivastava, A. Westerinen. **Iterative Multi-Tier Management Information Modeling.** IEEE Communications Magazine, December 2003.
23. J. Schönwälder, A. Pras, J. P. Martin-Flatin. **On the Future of Internet Management Technologies.** IEEE Communications Magazine, October 2003.

References V

24. R. State, E. Nataf, O. Festor. **A SMIng based Policy Access Control for SNMPv3**. 6th IEEE International Conference on High Speed Networks and Multimedia Communications, July 2003.
25. E. Nataf, O. Festor, and G. Doyen. **An SMIng-Centric Proxy Agent for Integrated Monitoring and Provisioning**. 8th IFIP/IEEE International Symposium on Integrated Network Management (IM), March 2003.
26. F. Strauß, T. Klie. **Towards XML-oriented Internet Management**. 8th IFIP/IEEE International Symposium on Integrated Network Management (IM), March 2003.
27. J. Schönwälder. **Simple Network Management Protocol (SNMP) over Transmission Control Protocol (TCP) Transport Mapping**. RFC 3430, TU Braunschweig, December 2002.
28. Aiko Pras, Szabi Boros, Bert Helthuis. **Remote MIB item look-up service**. Proc. IEEE/IFIP Network Operations and Management Symposium (NOMS), April 2002.
29. C. Elliot, D. Harrington, J. Jason, J. Schönwälder, F. Strauß, W. Weiss. **SMIng Objectives**. RFC 3216, Cisco Systems, Enterasys Networks, Intel Corp., TU Braunschweig, Ellacoya, December 2001.

References VI

30. J. P. Martin-Flatin. **Toward Universal Information Models in Enterprise Management.** VLDB 2001 Workshop on Databases in Telecommunications, September 2001.
31. B. Aboba, J. Arkko, D. Harrington. **Introduction to Accounting Management.** RFC 2975, Microsoft Corporation, Ericsson, Cabletron Systems Inc., October 2000.
32. R. Sprenkels, J. P. Martin-Flatin. **Bulk Transfer of MIB Data.** Simple Times, March 1999.