

Anatomy of an International Exchange Point: Distributed Network Monitoring Using MonALISA and NetFlow¹

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Abstract: In this paper we present a distributed network monitoring system, which exploits MonALISA (Monitoring Agents in A Large Integrated Services Architecture), a distributed web service delivery infrastructure designed to collect and process the network monitoring information. We augment the capability of MonALISA with FlowTools, the popular NetFlow data analysis toolset. We demonstrate how to integrate MonALISA and FlowTools via an UDP-listening agent ApMon, and highlight a case study of AMPATH, an international exchanging point located in Miami and serving a number of South American National Research and Education Networks (NRENs). Our experience showcases the elegant design philosophy of a scalable distributed service deployment platform coupled with the open-source traffic analysis tools and its impact on the daily operation of the production networks.

Keywords: NetFlow, MonALISA, FlowTools, Network monitoring.

1. INTRODUCTION

As the Internet expands both in its scope, reach and capacity, it becomes evident that there is a strong need to develop a distributed network monitoring infrastructure that can be scaled to support various network topology, traffic granularity and user applications. NetFlow[1] is a widely deployed router-based traffic monitoring mechanism. FlowTools[2] is an open-source NetFlow analysis toolset underlying the data gathering and analysis infrastructure of our project. It is our main motivation to effectively use NetFlow to gain crucial understanding of the traffic characteristics of the networks we operate. In particular, we are interested in understanding how to exploit the key advantages and avoid drawbacks of NetFlow-based traffic analysis by augmenting it with a distributed service-deployment platform. Indeed the focus of our work is to integrate MonALISA[3], a distributed monitoring system based on JINI/JAVA and WSDL/SOAP technologies. MonALISA's flexibility as a framework to gather, store and distribute network data collected was crucial to the success of our investigation and it shall become apparent throughout the course of this paper. The MonALISA framework provides a distributed monitoring service that not only is closely integrated with our monitoring and data distribution philosophy but also acts as a dynamic service system. The goal is to provide the monitoring information from large and distributed systems in a flexible and self-describing way as part of a loosely coupled service architectural model to perform effective resource utilization

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