Characterising the IETF Through the Lens of RFC Deployment

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This document specifies the Group Secure Association Key Management Protocol, GSAKMP. GSAKMP is a protocol that provides mechanisms for the management of group keys in a secure manner. It is designed to support the secure transmission of data in environments where multiple hosts are connected to a single network and require confidentiality of communications. GSAKMP is based on the Secure Extensible Key Management Protocol (SEKMP) and uses the Internet Protocol Security (IPsec) framework for key management. It supports the creation, deletion, and distribution of group keys, and provides mechanisms for key recovery in case of compromise. GSAKMP is intended for use in environments where multiple hosts require secure communication, such as in wireless networks or other environments where broadcast transmission is common. The protocol is designed to be backward compatible with SEKMP and to integrate seamlessly into existing IPsec environments.
RFC 2741: Agent Extensibility (AgentX) Protocol Version 1
RFC 1209: The Transmission of IP Datagrams over the SMDS Service
recovery, capabilities to recover from the compromise of Group
Protocol (GSAKMP). The GSAKMP provides a security framework for
This document specifies the Group Secure Association Key Management

Abstract
This document specifies an Internet standards track protocol for the

Status of This Memo
G. Gross
Network Working Group

Katz of Merit, Inc. The authors would also like to acknowledge the
This memo draws heavily in both concept and text from [4], written by
beyond the scope of this paper.
future documents. This document considers only directly connected IP
various service-specific issues. This memo does not preclude
This memo describes an initial use of IP and ARP in an SMDS service
standardization state and status of this protocol. Distribution of
packets over a Switched Multi-megabit Data Service Network configured
is normally attached, and the "server" host is the host which is
similar mapping by the other party. The NVT is intended to strike a
connection used to transmit data with interspersed TELNET control
communication ("linking") and process-process communication
The purpose of the TELNET Protocol is to provide a fairly general,
improvements. Please refer to the current edition of the "Internet

Obsoletes: NIC 18639                                            May 1983
Request for Comments: 854                                    J. Reynolds
Network Working Group                                          J. Postel

Information about the current status of this document, any errata,
Internet Standards is available in Section 2 of RFC 5741.
This document is a product of the Internet Engineering Task Force

Obsoletes: 5101                                               ETH Zurich
STD: 77                                                 B. Trammell, Ed.
Internet Engineering Task Force (IETF)                    B. Claise, Ed.

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Cisco Systems, Inc.

Version 1
Agent Extensibility (AgentX) Protocol
Cisco Systems, Inc.

Category: Standards Track          T.J. Watson Research Center, IBM Corp.

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improvements. Please refer to the current edition of the "Internet

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Creation of the IETF

459 RFCs published in 2006

RFCs published
Median days to publication was 469 in 2001.
Median days to publication was 469 in 2001, increasing to 1,170 in 2020.
Other document-based features described in the paper

Documents

Scope

Topics

Security

Scalability

Area

Type

Draft count

Days to publication

Citations

Network effect

Adds value

Performance

Nikkhah et al., “A Statistical Exploration of Protocol Adoption”. IEEE/ACM Transactions on Networking. DOI: 10.1109/TNET.2017.2711642
75% of authors were from North America in 2001, falling to 44% in 2020.
Representation from Europe and Asia has grown, with 40% of authors coming from Europe in 2020.
Africa and South America are still heavily underrepresented, with only 0.5% of authors coming from either continent in 2020.
Cisco is the single most frequent affiliation for authors across all years in the dataset.
Huawei appears in 2005, and 7% of authors came from the company in 2020.
25.6% of authors came from the top 10 affiliations in 2001.

Increasing to 35.4% by 2020.
Other author-based features described in the paper
E-mail volumes have plateaued at around 130,000 messages per year
.. while the number of people actively sending e-mails has been declining
Only 5.5% of authors interacted with more than 25 people in 2000.
Only 5.5% of authors interacted with more than 25 people in 2000, increasing to almost a quarter by 2020.
Number of e-mails mentioning drafts

Count of emails sent to junior author

Count of emails sent to senior author

Count of participants emailing junior author

Count of participants emailing senior author

Other email-based features described in the paper

Number of e-mails sent to authors
to perform access control decisions during group establishment and mechanisms to disseminate group policy and authenticate users, rules Protocol (GSAKMP). The GSAKMP provides a security framework for

Abstract

This document specifies the Group Secure Association Key Management Protocol (GSAKMP). The GSAKMP provides a security framework for

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Request for Comments: 4535                                       U. Meth

Network Working Group                                          H. Harney
members, delegation of group security functions, and capabilities to

IdentAware

G. Gross

Category: Standards Track                                   A. Colegrove

Network Working Group                                          H. Harney

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Internet community, and requests discussion and suggestions for

requirement of the specification.

o MUST, SHALL, or MANDATORY -- the item is an absolute

Internet Engineering Task Force.

This memo draws heavily in both concept and text from [4], written by

configurations may be treated differently and will be described in

various service-specific issues.  This memo does not preclude

environment configured as a logical IP subnetwork, LIS (described

This memo describes an initial use of IP and ARP in an SMDS service

Abstract

March 1991

Documents

Authors

Mailing lists

Widely deployed

Not widely deployed
More detailed discussion of the model in the paper
Results

- Our additional features improved the performance of the model, vs. the baseline

- Features such as whether the RFC adds value, is scalable, builds on previous RFCs, is more widely cited by other RFCs, and includes more keywords are positively correlated with deployment

- We find that author demographic features, like geographic location and affiliation, aren’t significant predictors of deployment
Results

- Building on existing work
- Limited scope
- Setting normative requirements
- Meeting a need
Summary

- RFC production rates are slowing, and RFCs are taking longer to produce
- The IETF’s community is becoming more diverse, but issues remain
- The IETF itself does a good job of identifying successful protocols, and building on them
- Much more data left to analyse: GitHub issues, meeting materials, ...

Characterising the IETF Through the Lens of RFC Deployment

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Tyson, Matthew Purver, Patrick Healey, Waleed Iqbal, Junaid Qadir, and Igna-


ACM, New York, NY, USA, 13 pages.

CCS CONCEPTS
• Social and professional issues → Use characteristics → Networking

KEYWORDS
Protocol standards, IETF, Request for Comments

ABSTRACT
Protocol standards, defined by the Internet Engineering Task Force (IETF), are crucial to the successful operation of the Internet. This paper presents a large-scale empirical study of IETF activities, with a focus on understanding collaborative activities, and how these influence the publication of standards documents (RFCs). Using a unique dataset of 21 million emails, 3,074 (IETF) and 2,116 authors, we examine the skills and trends within the standards development process, showing how protocol complexity and time to produce impact the success or failure of a standard. Using a unique dataset, this study sheds light on the process by which network protocol standards are developed, demonstrating multiple rounds of open feedback and review, have proven remarkably effective in designing high-quality and robust protocols. Understanding the factors that lead to successful uptake and deployment of protocols, deriving insights to improve the standardisation process. Therefore, important to our understanding of the Internet and how it has evolved.
Summary

- RFC production rates are slowing, and RFCs are taking longer to produce.
- The IETF itself does a good job of identifying successful protocols, and building on them.
- Much more data left to analyse: GitHub issues, meeting materials, ...

More information about the project, including tooling at https://sodestream.github.io