Overview of the IETF

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LANOMS 2005

Porto Alegre – Brazil

Thanks to IETF EDU-team for materials

Tutorial 1 – Part 1

The IETF

Internet Engineering Task Force

Formed in 1986

Was not considered important for a long time - good!!

Not government approved - great!!

People not companies

"We reject kings, presidents and voting. We believe in rough consensus and running code"

Dave Clark

IETF Overview

IETF has **no** members, **no** voting

1,200 to 2000 at 3/year meetings, ***more*** on mail lists

124ish **working groups** (where real work happens)

If it matters to the Internet, it matters to us

7 **areas** (for organizational convenience)

- APS, GEN, INT, O&M, RTG, SEC, TSV

Management: **IESG** (ADs, chosen by community)

Architectural guidance & liaisons: **IAB** (also chosen by community)

Produces **standards** and other **documents**

I E T F

IETF "Standards"

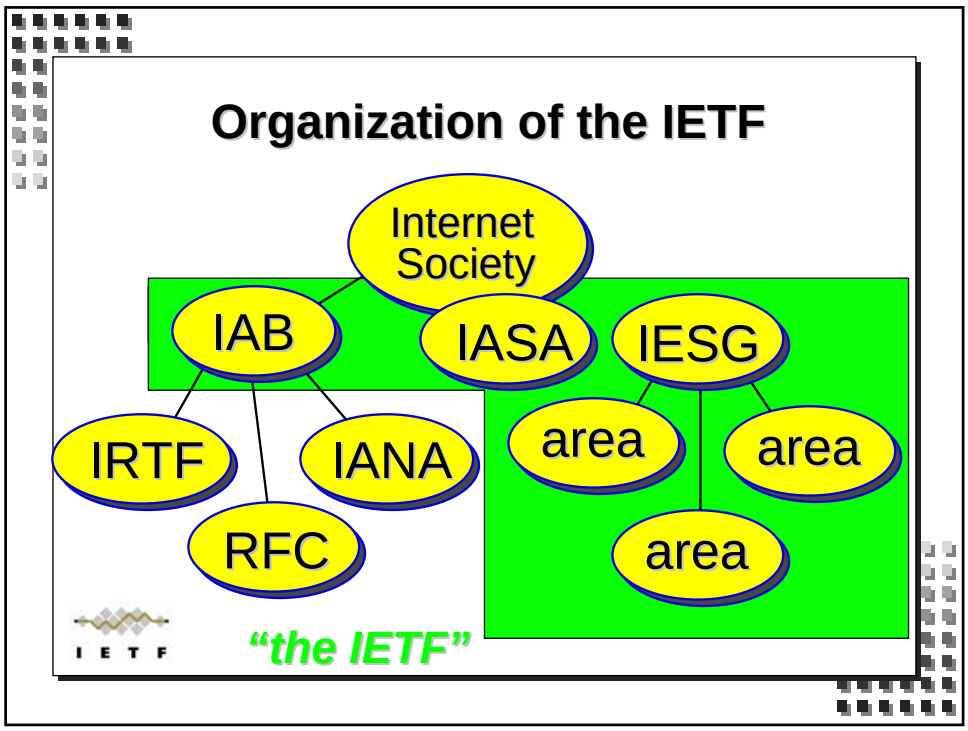
IETF standards not standards "because we say so"

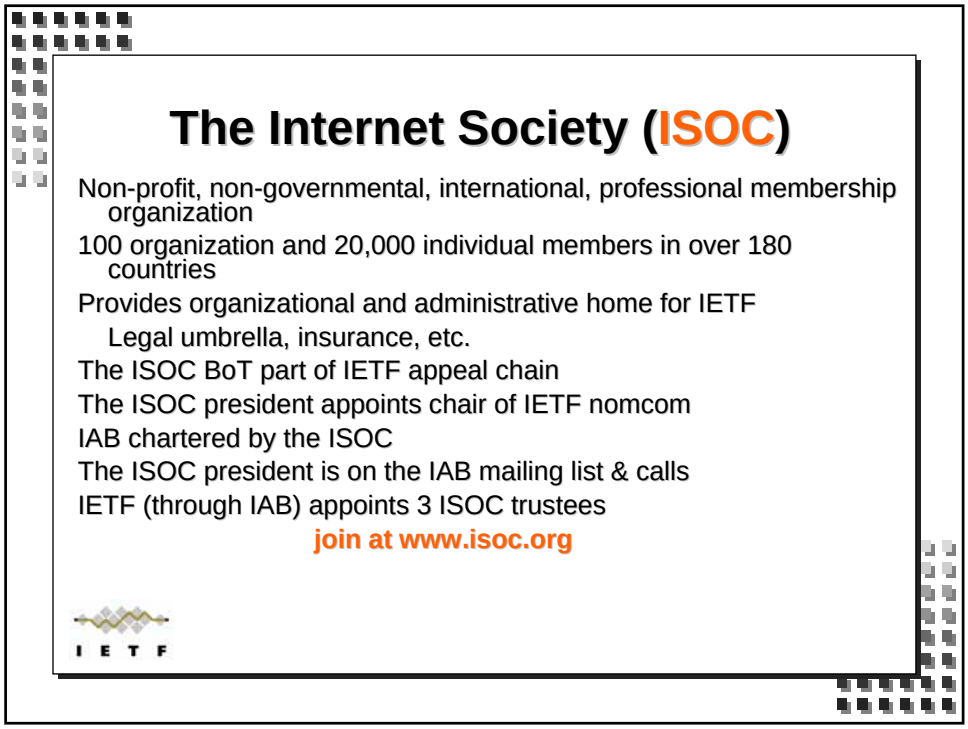
Only standards if/when people **use** them

No formal recognition

No submitting to "traditional" standards bodies

I E T F


Organization of the IETF
Internet Society
IAB
IASA
IESG
IRTF
IANA
RFC
area
area
area
"the IETF"
IETF


The Internet Society (ISOC)
Non-profit, non-governmental, international, professional membership organization
100 organization and 20,000 individual members in over 180 countries
Provides organizational and administrative home for IETF
Legal umbrella, insurance, etc.
The ISOC BoT part of IETF appeal chain
The ISOC president appoints chair of IETF nomcom
IAB chartered by the ISOC
The ISOC president is on the IAB mailing list & calls
IETF (through IAB) appoints 3 ISOC trustees
join at www.isoc.org
IETF

Internet Research Task Force (IRTF)

Focused on **long term** problems in Internet

- Anti-Spam
- Crypto Forum
- Delay-Tolerant Networking
- End-to-End
- Host Identity Protocol
- Internet Measurement
- IP Mobility Optimizations
- Network Management
- Peer-to-Peer
- Routing

For more information see **http://www.irtf.org**

Internet Architecture Board (IAB)

Provides overall **architectural advice** to the IESG, the IETF & the ISOC

Advises the IESG on IETF working group formation

Deals with IETF external liaisons

Appoints the IRTF chair

Selects the IETF-IANA

Oversees the RFC Editor

Hosts workshops

Chartered by the ISOC

IAB Members

Bernard Aboba
Loa Andersson
Brian Carpenter
(new IETF Chair)
Leslie Daigle
(current IAB chair)
Patrik Fältström
Kurtis Lindqvist

Bob Hinden
Dave Meyer
Eric Rescorla
Pekka Nikander
Pete Resnick
Jonathan Rosenberg
Lixia Zhang

Internet Assigned Number Authority (IANA)

Assigns parameters and keeps them from colliding
- protocol numbers
- IP addresses
  - mostly delegated to the 4 (going on 5) IP Address registries
- domain names
  - deals with top level domains (TLDs)
  - rest delegated to DNS name registries

Functions split with the creation of **ICANN**
- **I**nternet **C**orporation for **A**ssigned **N**ames and **N**umbers
- Independent corporation to take over IANA functions
  - Under contract with US government
  - Now **IETF-IANA** and non-IETF-IANA

RFC Editor

Historically Jon Postel and helpers

Now a small group funded by the ISOC

- rfc-editor@rfc-editor.org

Semi-independent

- Gets requests to publish IETF IDs from IESG
- Gets requests to publish independent info and exp RFCs
  - asks IESG for advice on publishing independent RFCs
  - but can exercise own discretion
  - presumption is to publish technically competent IDs
    - which sometimes is a conflict with IESG

IETF Chair

Brian Carpenter <chair@ietf.org>

- also chair of the **IESG**
- also director of the **General Area**
- also ex officio member of the **IAB**

Nominated by IETF community - this includes <u>you</u>

Selected by nomcom

IETF's "CTO" - "Chief Talking (& Traveling) Officer"

Area Directors (ADs)

Nominated by the community – this includes you

Selected by nomcom

Responsible for **setting direction** in Area

Responsible for **managing process** in Area

- approve BOFs & working group charters
- then go to IESG & IAB for final approval

Reviews working group documents

Most Areas have 2 ADs

- all but General Area

Internet Engineering Steering Group (IESG)

IETF Chair + rest of ADs

IETF **process management and RFC approval** body

Approves WG creation

Reviews & approves publication of IETF documents

- reviews and comments on non-IETF submissions

Multi-disciplinary technical review group

IETF Areas

IETF Chair & AD for General Area (**gen**) (2 WGs)
- Brian Carpenter <chair@ietf.org>

Applications (**app**) (15 WGs)
- Ted Hardie <hardie@qualcomm.com>
- Scott Hollenbeck <sah@428cobrajet.ne>

Internet (**int**) (24 WGs)
- Mark Townsley <townsley@cisco.com>
- Margaret Wasserman <margaret@thingmagic.com>

Operations & Management (**ops**) (21 WGs)
- David Kessens <david.kessens@nokia.com>
- Bert Wijnen <bwijnen@lucent.com>

IETF Areas (cont.)

Routing (**rtg**) (15 WGs)
- Bill Fenner <fenner@research.att.com>
- Alex Zinin <zinin@psg.com>

Security (**sec**) (20 WGs)
- Sam Hartman <hartmans-ietf@mit.edu>
- Russ Housley <housley@vigilsec.com>

Transport Services (**tsv**) (25 WGs)
- Allison Mankin mankin@psg.com
- Jon Peterson <jon.peterson@neustar.biz>

IETF Secretariat

Organizes/Coordinates

- plenary meetings
- mailing lists hosted by IETF
- Internet-Draft directory
- IESG teleconferences
- day to day work of IESG and working groups

Currently provided by Foretec – Reston, Virginia

- Will be changing

Funded from IETF meeting fees & (soon) ISOC

IETF Administrative Support Activity (IASA)

Provides the administrative structure required to support the IETF standards process

Housed within the Internet Society

- creates budget for IETF
  - money from meeting fees & ISOC
- responsible for IETF finances
- contracts for IETF support functions
  - Secretariat functions, RFC Editor & IETF-IANA
- deals with IETF IPR

IASA
(continued)

Includes

- IETF Administrative Director (**IAD**)
  - ISOC employee
  - day to day operations oversight
- IETF Administrative Oversight Committee (**IAOC**)
  - 8-member body - IAB & IETF chairs & ISOC pres plus members selected by nomcom, IAB, IESG & ISOC
  - task: IASA oversight

Documented in RFC4071 – BCP101

Selecting IETF Management

RFC 3777 describes process

IESG & IAB members normally have 2-year terms

Picked by a nominations committee (**nomcom**)

- nomcom chair appointed by the ISOC president

nomcom selects community nominees for each job

- reviews one half of the IESG, half of the IAB each year
- includes the IETF chair
- IESG approved by IAB, IAB approved by the ISOC BoT

nomcom selected **randomly** from list of volunteers

- volunteers have to have been at 3 of last 5 IETF meetings
  - ***very*** random selection process

Dots

- IAB member (red)
- IESG member (yellow)
- Working Group chair (blue)
- nomcom (orange)
- Local host (green)

Working Groups

This is where the IETF primarily get its work done

RFC 2418 describes WG operation

Working group focused by charter agreed between chair(s) and area director

- **restrictive** charters with deliverables and **milestones**
- working groups **closed** when their work is done

Charter approved by IESG with IAB advice

AD with IESG has final say on charter & chair(s)

Working Groups
(continued)

"...**rough consensus** and running code."

No formal voting

- can do show of hands or hum

Does **not** require unanimity

Disputes resolved by discussion

Mailing list and face-to-face meetings

- most work happens on mailing lists
- all decisions must be verified on mailing list
- face-to-face discussion to resolve disagreements

I E T F

IETF Documents

All **open** - no "confidential contributions"

Developed as Internet-Drafts

- **anyone** can submit - "expire" in 6 months
- **some** I-Ds are working group documents

Published as RFCs

- archival publications (never changed once published)
- different types: (not all RFCs are standards!)
  - informational, experimental, BCP, standards track, historic

3-stage standards track, under review in NEWTRK

- Proposed Standard, Draft Standard, Internet Standard

Interoperability not conformance

I E T F

What is a RFC?

IETF document publication series

RFC used to stand for Request for Comments

- now just a name
- now tend to be more formal documents than early RFCs

Now well over 4000 RFCs

- RFC 1 *Host Software* - Apr 7 1969

"Not all RFCs are standards"

- see RFC 1796
- though some vendors imply otherwise

Many types of RFCs

I E T F

RFC Repository Contains:

Standards track
- OSPF, IPv6, IPsec ...

Obsolete Standards
- RIPv1

Requirements
- Host Requirements

Policies
- Classless InterDomain Routing

April fool's day jokes
- IP on Avian Carriers ...
- ... updated for QoS

Poetry
- 'Twas the night before startup

White papers
- On packet switches with infinite storage

Corporate documentation
- Ascend multilink protocol (mp+)

Experimental history
- Netblt

Process documents
- IETF Standards Process

I E T F

Working Documents

Internet-Draft

- input to the process or for background information
- **no admissions control** other than IPR statements
- anyone can submit an ID
- **zapped** from IETF directory after 6 months
  - but many mirrors exist
- almost all RFCs must pre-exist as IDs
  - exceptions: some RFCs created by IANA or RFC Editor

Standards Track RFCs:

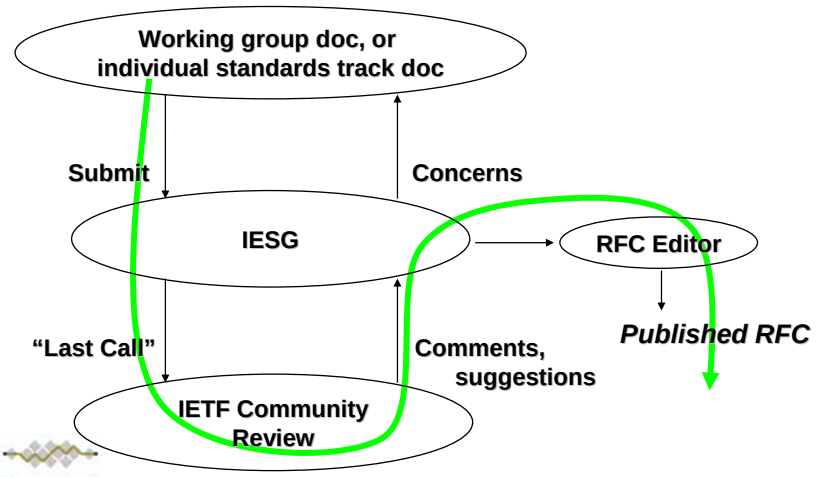
- Start at Proposed Standard (**PS**)
  - good idea, no known problems
  - implementation required at AD discretion
- Advance to Draft Standard (**DS**)
  - stable Proposed Standard specification
  - multiple interoperable implementations
  - note IPR restriction
- Advance again to Internet Standard (**STD**)
  - Draft Standard with wide deployment and use
- Best Current Practices (**BCP**)
  - generally policies or IETF procedures
  - (best way we know how)

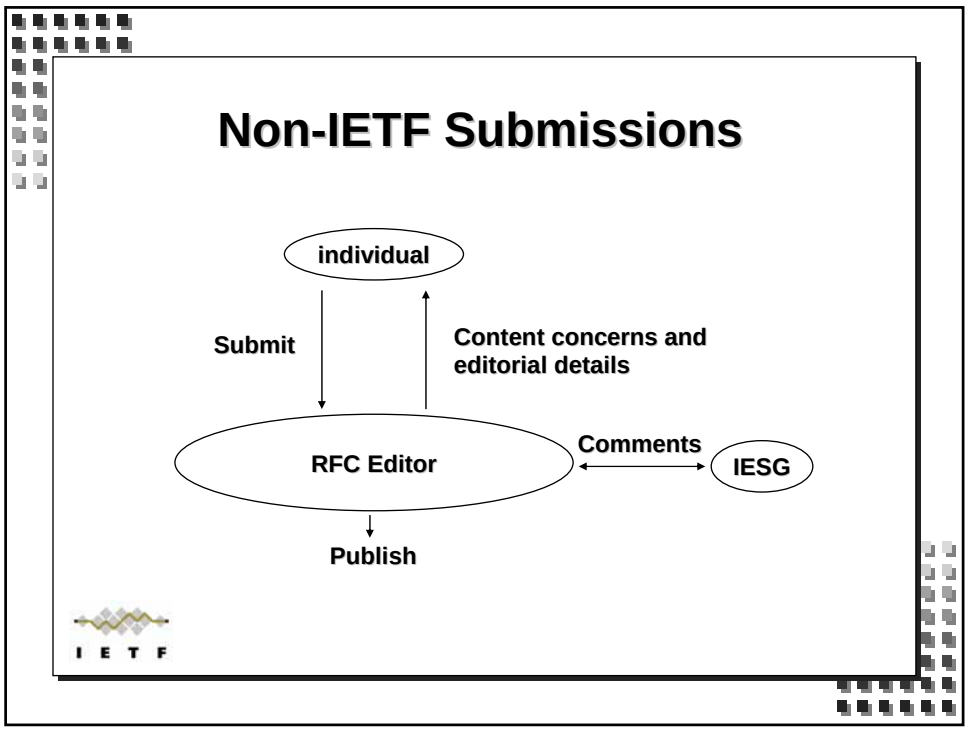
IETF Standards Process

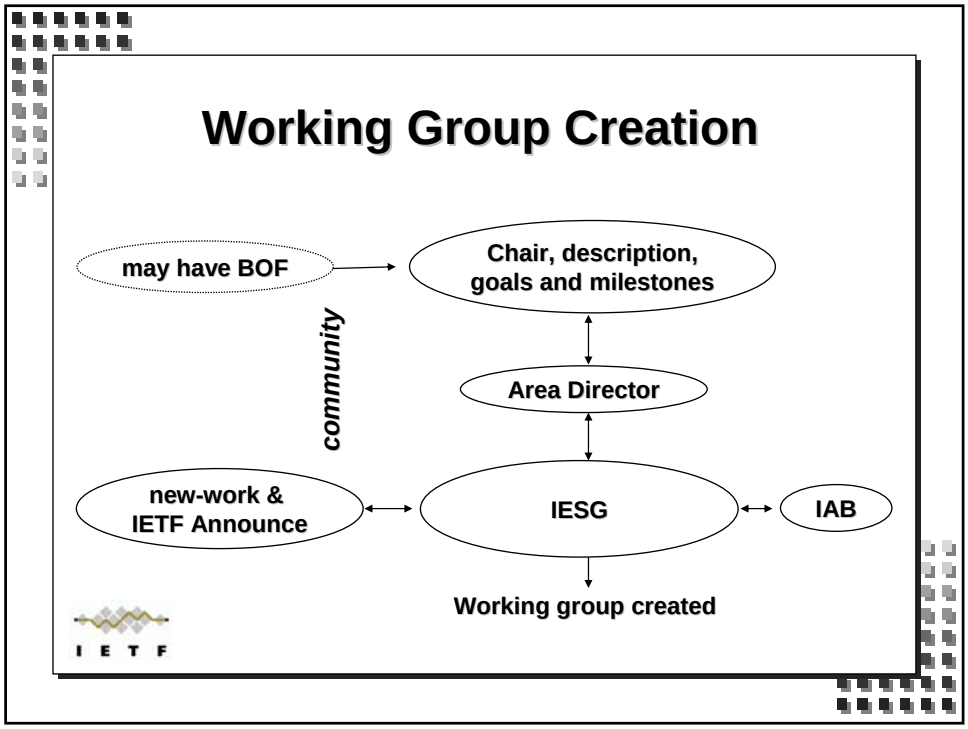
Specification published as Internet Draft
Discussed in a working group - creates revised IDs
ID sent to IESG after working group consensus
IESG issues **IETF Last Call** (2 weeks)
- anyone can comment
- IESG considers comments and its own review
  - may approve publication as standards track RFC
  - may point out issues to working group & return ID

Similar process for non-WG drafts (with 4-week LC)

IETF Submission




Non-IETF Submissions
individual
Submit
Content concerns and editorial details
RFC Editor
Comments
IESG
Publish
I E T F


Working Group Creation
may have BOF
Chair, description, goals and milestones
community
Area Director
new-work & IETF Announce
IESG
IAB
Working group created
I E T F

Appeals Process

IETF decisions can be appealed
- start level above decision being appealed

1st to the WG chair(s)
Only then to the Area Director
Only then to the IESG
Only then to the IAB
If claim is that **the process** has not been followed,
- only then an appeal can be made to the ISOC Board

It is OK to appeal decisions – people do
- but appeals are not quick
  - starting "low" is the right thing to do

IPR (Patents)

IETF IPR (patent) rules in RFC 3979
Current IETF rules
- require **disclosure** of your own IPR in your own submissions & submissions of others
- "**reasonably and personally**" known IPR
  - i.e., no patent search required

WG takes IPR into account when choosing technology
- RFC 3669 gives background and guidance

Push from open source people for RF-only process
- consensus to not change to mandatory RF-only
  - but many WGs **tend** to want RF or IPR-free

IPR (Copyright)

Author(s) need to give publication rights to the ISOC (IETF) if document is to be published at all

even as an Internet-Draft

But authors **retain** most rights

ID notices:

1/ agreement that IPR disclosures have been (or will be) made

2/ (optional) no right to produce derivative works

3/ (optional) just publish as ID

4/ Copyright statement

Standards track requires IETF change control

i.e., no “no derivative works” restrictions

I E T F

Note Well (1)

The “Note Well” statement shows up a lot at the IETF.

Mailing lists, registration, meeting openings, etc.

“**Any submission to the IETF intended by the Contributor for publication as all or part of an IETF Internet-Draft or RFC and any statement made within the context of an IETF activity is considered an "IETF Contribution".**

continued ...

I E T F

Note Well (2)

"Such statements include oral statements in IETF sessions, as well as written and electronic communications made at any time or place, which are addressed to:

- the IETF plenary session
- any IETF working group or portion thereof
- the IESG, or any member thereof on behalf of the IESG
- the IAB or any member thereof on behalf of the IAB
- any IETF mailing list, including the IETF list itself, any working group or design team list, or any other list functioning under IETF auspices
- the RFC Editor or the Internet-Drafts function"

continued ...

Note Well (3)

"All IETF Contributions are subject to the rules of RFC 3978 and RFC 3979.

Statements made outside of an IETF session, mailing list or other function, that are clearly not intended to be input to an IETF activity, group or function, are not IETF Contributions in the context of this notice.

Please consult RFC 3978 for details."

What next?

Join mailing lists

- *This is where the work happens*

Read the drafts

Don't be shy

Talk to people

Look for common ground

Help people

Don't settle for settle for second-rate

I E T F

Questions?

I E T F

IETF OPS Area
Operations and Management

Bert Wijnen (bwijnen@lucent.com)

IETF co-Area Director for OPS-NM

LANOMS 2005

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Tutorial 1 – Part 2

Agenda

- **IETF documents**
  - **RFC status**
  - **Internet Drafts**
- **SNMP Status**
- **However – we need more**
  - **What do Operators Want/Need ?**
- **NETCONF**
- **ISMS**
- **OPS-NM Activities in IETF**
- **Other NM activities in IETF**

RFC-Status

- Not All RFCs are Standards !!!!!!
- Standards Track
  - Proposed Standard (PS)
  - Draft Standard (DS)
  - (full) Internet Standard (STD)
- Best Current Practice (BCP)
- Informational (some are FYI)
- Experimental
- Historic
- April 1st

RFC-Status (continued)

- Standards Track Advancement (RFC2026)
  - Proposed Standard (PS) (WG Consensus)
    - 6 to 24 months
    - Please implement and try;
    - Recycle if problems
  - Draft Standard (DS)
    - Solid Specification;
    - We believe it will not change
    - Multiple Independent Interoperable Implementations
    - Safe to implement and deploy in mission critical environment
  - Internet Standard (STD)
    - Wide deployment and useful in real world

Internet-Drafts

- Not all Internet Drafts are WG or IETF endorsed documents
- Most WG documents are named
  - draft-ietf-<wg-name>-something-nn.txt
- Most non-WG documents are named
  - draft-ietf-<author>-something-nn.txt
  - Draft-ietf-<author>-<wg-name>-something-nn.txt
- See http://www.ietf.org/html.charters/wg-dir.html
  - For all WG charters and WG documents

SNMP Status and Versions

- SNMP Message Wrappers:
  - SNMPv1
  - SNMPv2c
  - SNMPv3
- SNMP Protocol Operations (PDUs):
  - SNMPv1 Protocol Operations
  - SNMPv2 Protocol Operations
- Structure of Management Information (SMI):
  - SMIv1
  - SMIv2

SNMP Status – version 1

- SNMPv1 message wrapper
  - no Security,
  - i.e. community string (plain text password)
- SNMPv1 Protocol Operations
  - GET,GETNEXT,
  - SET
  - GETRESPONSE,
  - TRAPv1
- SMIv1 data types
  - MIBs in SMIv1 format

SNMP Status – version 1 (cont)

- SNMPv1 - (Full) Internet Standard
  ===➔ but now **HISTORIC**
- RFC1157 (STD 15) ===➔ but now **HISTORIC**
  - Specifies Message Wrapper
  - Specifies Protocol Operations (PDUs)
- SMIv1 - (Full) Internet Standard
  - RFC1155 and RFC1212 (STD16)
  - RFC1215 (informational)
- MIB II - (Full) Internet Standard
  - RFC 1213 (STD 17)
  - Various Other MIBs (Proposed and Draft Stds)

SNMP Status – version 2c

- message wrapper
  - no Security (communityString (plain text pw))
- SNMPv2 Protocol Operations
  - Improved PDU error codes, exceptions
  - GET, GETNEXT, GETBULK
  - SET
  - GETRESPONSE
  - TRAPv2, INFORMS
- SMIv2 data types
  - Textual Conventions
  - Conformance
  - MIBs in SMIv2 format

SNMP Status – v2c (continued)

- SNMPv2c - Mixed Standardization Levels
  - RFC1901 – experimental ===➔ but now **HISTORIC**
    - Specifies Message Wrapper
  - RFC3416 (STD)
    - Specifies Protocol Operations (PDUs)
  - RFC3417 (STD)
    - Specifies Transport Mappings
- SMIv2 - (Full) Internet Standard (STD 58)
  - RFC2578 - SMIv2
  - RFC2579 - Textual Conventions for SMIv2
  - RFC2580 - Conformance Statements for SMIv2
- Various MIBs
  - RFC3418 (STD) and many others

SNMP Status - Architecture

- SNMP Architecture
  - Modular Approach, Extensible
  - Multiple Security Protocols/Mechanisms
  - View Based Access Control Model
  - Coexistence of multiple SNMP versions
    - Specifically SNMPv1, SNMPv2c, SNMPv3
    - Also future versions (if any)
  - Remotely Configurable via SNMP
    - users and their security mechanisms/secrets
    - access to MIB objects
    - notification destinations and filtering
    - proxy configuration

SNMP Status – version 3

- SNMPv3 message wrapper
  - Real Message Security
  - User Based Security Model
    - Authentication (SHA-1 and MD5)
    - Privacy (CBC-DES encryption)
  - Allows 3 security Levels
    - not Authenticated, no Privacy (same as SNMPv1/v2c)
    - authenticated but no Privacy
    - authenticated with Privacy
  - Replay protection (limited)
  - Message level error reporting (Reports)
  - Scoped PDU allows for Multiple Contexts

SNMP Status – version 3 (cont)

- SNMPv3 – (full) Internet Standard (STD 62)
  - RFC3410 - Introduction (Informational)
  - RFC3411 - Architecture
  - RFC3412 - Message Processing
  - RFC3413 - Applications
  - RFC3414 - User Based Security Model
  - RFC3415 - View-Based Access Control Model
  - RFC3416 - Protocol Operations
  - RFC3417 - Transport Mappings
- SMIv2 - (Full) Internet Standard (STD 58)
  - RFC2578 - SMIv2
  - RFC2579 - Textual Conventions for SMIv2
  - RFC2580 - Conformance Statements for SMIv2

SNMP Status – version 3 (cont)

- Various MIBs (full Internet Standard)
  - RFC3411 - SNMP-FRAMEWORK-MIB
  - RFC3412 - SNMP-MPD-MIB
  - RFC3413 – 3 MIB modules
    - SNMP-TARGET-MIB
    - SNMP-NOTIFICATION-MIB
    - SNMP-PROXY-MIB
  - RFC3414 - SNMP-USER-BASED-SM-MIB
  - RFC3415 - SNMP-VIEW-BASED-ACM-MIB
  - RFC3418 - SNMPv2 MIB
  - and many others at various standards levels
- SNMP Co-existence – (BCP)
  - RFC3584 - SNMP-COMMUNITY-MIB

SNMP Status – SNMPv3 Features

- Comes with Modular and Extensible Architecture
- Improved SNMPv2 Operations
  - GetBulk, Inform
  - Better error Codes and Exception Codes
- Security and Access Control to MIB objects
- Remote Configuration of SNMP Engine
- Coexistence with SNMPv1 and SNMPv2c
- Over 10 interoperable implementations
- Various vendors are shipping
- Deployment reports coming in
- See http://www.ibr.cs.tu-bs.de/projects/snmpv3

However – We need more

- SNMPv3 is full Standard for IETF NM
- But few years back the Network Operators participating in IETF claimed
  - They do use SNMP for monitoring
  - They occasionally use SNMP for Control
  - They rarely use SNMP for Configuration
- This caused some sort of “clash” between the IETF Network Operators and the SNMP developers
- But we do want to develop relevant NM standard protocols that actually get used!

However – We need more (cont)

- So we did a global tour:
  - Various IETF meetings
  - RIPE meetings
  - NANOG meetings
  - Usenix meetings
  - Email discussions
- to investigate:
  - How much is SNMP used and for what
  - Is the situation different for different operators
  - Is there any configuration via SNMP
  - What are the perceived problems

However – We need more (cont)

- The results motivated a IAB workshop on NM
  - Many types of operators (IP, Telecom, Enterprise, Academia), NM vendors, NM Protocol developers)
  - Report of that workshop is in RFC 3535
- That RFC contains/discusses:
  - Network Management Technologies (SNMP, CIM, COPS-PR, CLI, Telnet, SSH, proprietary, etc)
  - A set of 14 operator requirements, but notes:
    - So far, there is no published document that clearly defines the requirements of the operators.
  - A set of 33 “consolidated observations”
  - A set of 8 recommendations

However – We need more (cont)

- The IAB workshop on NM did reveal:
  - a lot of interest in XML
  - which seems to be able to address a lot of issues
  - But XML is just a data wrapper, not the holy grail
  - One needs more than just the buzword XML
- The result was a couple of BOFs at IETF
- Which resulted in a pretty focused NetConf Working Group
  - Protocol only (focus on configuration, not monitoring)
  - Data Model later

Conceptual NetConf Layers

```
          Layer                 Example
      +---------------------+   +---------------------------------------+
(4)   |     Content         |   |     Configuration data                |
      +-------------------+   +---------------------------------------+
                |                           |
      +---------------------+   +---------------------------------------+
(3)   |   Operations        |   | <get-config>, <edit-config>           |
      +---------------------+   +---------------------------------------+
                |                           |
      +---------------------+   +---------------------------------------+
(2)   |       RPC           |   |       <rpc>, <rpc-reply>              |
      +---------------------+   +---------------------------------------+
                |                           |
      +---------------------+   +---------------------------------------+
(1)   | Application         |   |  BEEP, SSH, SSL, console              |
      |  Protocol           |   |                                       |
      +---------------------+   +---------------------------------------+
```

draft-ietf-netconf-prot-07.txt

NetConf concepts

- Configuration viewed as an XML document
- Configuration changes via "patches" to the XML document
- Information retrieval with filtering capability
- Support for multiple configuration "datastores"
- Locking on the datastore level
- Commit/rollback support (capability)
- Authentication and encryption left to the transport (ssh mandatory)
- Extensible for new operations via capabilities
- network wide configuration change transactions

NetConf status

- 4 documents are in AD-review for Proposed Std
  - draft-ietf-netconf-prot-07.txt
  - draft-ietf-netconf-ssh-04.txt
  - draft-ietf-netconf-beep-05.txt
  - draft-ietf-netconf-soap-05.txt
- Next steps are IETF Last Call and IESG approval, after which they become RFCs
- At IETF63 WG talked about WG charter updates:
  - extensions to current protocol
  - Potentially some data modeling work

NetConf status

- Interoperability event right before IETF63 in Paris (july 28-30). See:
  - http://www.ist-mome.org/events/interop/
- So there are currently implementations, also a free one:
  - http://sourceforge.net/projects/yenca/
  - I do not know the completeness or quality of this one

ISMS – why is it needed

- SNMPv3 has “embedded” security
- SNMPv3 has detailed Access Control Model
- SNMPv3 needs separate configuration of the security and access “parameters”
- That is claimed to be too much of a burden
- Need/requirement to integrate with existing mechanisms/protocols
- Hence ISMS WG

ISMS

- Integrated Security Model for SNMPv3
- Working Group in IETF
- Addressing operator practical needs to be able to share/re-use existing security infrastructure (specifically SSH, Radius and local users)
- WG has problems focusing. But is trying hard. New WG charter is on IESG table.

IETF NM Protocols

- Main Protocols:
  - SNMPv3 – full Internet Standard (STD 62)
    - SNMPv1 and SNMPv2c are now HISTORIC
  - NetConf – Network Configuration Protocol
    - Close to completion and ready for Proposed Standard (PS)
- Others:
  - COPS – Proposed Standard (PS)
    - Outsourced Policiy Decisions
  - COPS-PR – Proposed Standard (PS)
    - Policy Provisioning
  - GSMP – Proposed Standard (PS)
    - General Switch Management Protocol

IETF Information/Data Modeling

- SMIv2 – full Internet Standard (STD)
  - Many MIBs defined (PS, DS, STD)
  - Many MIBs defined outside IETF
  - Used with SNMP
- No standards work on NetConf XML data modeling (yet)
- SPPI – Proposed Standard (PS)
  - A few PIBs defined (Informational)
  - A few PIBs defined outside IETF
  - Used with COPS-PR
- PCIM – Proposed Standard (PS)
  - A few “modules” defined
  - Used with LDAP

IETF NM summary: Focus on Element Management

- typically working on instrumentation of protocols stacks, applications, services
- typically working on instrumentation of Network Elements and Interfaces
- Most IETF protocols will come with one or more MIB module(s) for it
- Not working much (if any) on NM applications or interfaces (APIs) for such applications

Monitoring vs Configuration

- Majority of focus has been on monitoring with SNMP and MIB modules.
- Configuration (write access) has been claimed to be difficult/problematic
- Although there are success stories of using SNMP for configuration
- NetConf is intended to address SNMP shortcomings for configuration

OPS-NM related IETF work

- HUBMIB WG
  - 2 documents nearly ready for IETF Last Call
    - draft-ietf-hubmib-efm-epon-mib-03.txt
    - draft-ietf-hubmib-efm-mib-03.txt
  - Working on 2 more documents
- RMONMIB WG
  - widely used monitoring MIB modules
    - (RMON2 nearly done for Draft Standard)
  - Application performance monitoring MIB (done)
  - Real-time Application Quality of Service Monitoring (RAQMON) MIB (nearly ready for IETF Last Call)

OPS-NM related IETF work (cont)

- DISMAN WG
  - Distributed Management
  - Basically working on MIB revisions
  - Remote Operations (Ping, Traceroute, dnslookup)
  - Script and Scheduling MIBs
  - Expression, Event and Notification Logging MIBs
  - Recently Published
    - RFC3877 – Alarm MIB
    - RFC3878 – Alarm Reporting Control MIB

OPS-NM related IETF work (cont)

- Many MIB related WGs
  - IPCDN
    - Cable Modem related MIB work
  - ADSLMIB
    - Concentrating on ADSL2 MI work
  - BridgeMIB
    - Work being completed, then transfer work to IEEE
  - EntityMIB
    - Completed their charter.

OPS-NM related IETF work (cont)

- Many MIB related WGs
  - IMSS
    - Working on T11 MIB modules for Fibre Channel
  - ADSLMIB
    - Concentrating on ADSL2 MI work
  - BridgeMIB
    - Work being completed, then transfer work to IEEE
  - EntityMIB
    - Completed their charter.

OPS-NM related IETF work (cont)

- Other (non-MIB) WGs
  - OPSEC
    - Operational Security Capabilities for IP Network Infrastructure
  - IPFIX
    - IP Flow Information Export
  - PSAMP
    - Packet Sampling
  - MIB review Guidelines (approved as BCP)
    - draft-ietf-ops-mib-review-guidelines-04.txt

Other NM related work in IETF

- IPPM WG (Transport Area)
  - IP Performance metrics
  - IANA maintained registry (MIB module)
- IPS WG (Transport Area)
  - Has/had various work items for IP Storage
  - Quite a bit of MIB work for IP Storage
- MIB work in many IETF WGs
  - So we get proper subject matter experts

More information

- http://www.ietf.org/html.charters/wg-dir.html
  - For all current IETF Working Groups
- http://www.ietf.org
  - Starting point for IETF information
- http://www.ops.ietf.org
  - Starting point for OPS Area specific web pages
- http://www.irtf.org/charter?gtype=rg&group=nmrg
  - Network Management Research Group
  - Recently had a meeting on VoIP related NM topics

Mailing lists

- WG mailing lists (found in WG charters)
- Ietfmibs@ops.ietf.org
  - Subscribe via majordomo@ops.ietf.org
- Ops-nm@ops.ietf.org
  - Subscribe via majordomo@ops.ietf.org

Questions ?

- Question: yes
- Answers: ???
- I will try to answer