

IETF NM activities Update
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Lucent Technologies
Bell Labs Innovations



IETF NM Activities

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Agenda

- IETF documents
 - ◆ RFC status
 - ◆ Internet Drafts
- SNMP Status
- IETF – Current NM (SNMP) Activities
- Other NM Activities in IETF
- What do Operators Want/Need ?
- Service Management ?

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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

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IETF - RFC Status (continued)

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

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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

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SNMP Status - versions

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

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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

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SNMP Status - version 1 (continued)

- SNMPv1 - (Full) Internet Standard
 - ◆ RFC1157 (STD 15)
 - ☞ 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)

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SNMP Status - version 2c

- SNMPv2c message wrapper
 - ◆ no Security (communityString (plain text pw))
- SNMPv2 Protocol Operations
 - ◆ Improved PDU error codes, exceptions
 - ◆ GET, GETNEXT, GETBULK
 - ◆ SET
 - ◆ GETRESPONSE
 - ◆ TRAPv2, INFORM
- SMIv2 data types
 - ◆ Textual Conventions
 - ◆ Conformance
 - ◆ MIBs in SMIv2 format

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SNMP Status - version 2c (continued)

- SNMPv2c - Mixed Standardization Levels
 - ◆ RFC1901 - experimental
 - ☞ Specifies Message Wrapper
 - ◆ RFC1905 (Draft Standard)
 - ☞ Specifies Protocol Operations (PDUs)
 - ◆ RFC1906 (Draft Standard)
 - ☞ Specifies Transport Mappings
- SMIv2 - (Full) Internet Standard (STD 58)
 - ◆ RFC2578 - SMIv2
 - ◆ RFC2579 - Textual Conventions for SMIv2
 - ◆ RFC2580 - Conformance Statements for SMIv2
- Various MIBs
 - ◆ RFC1907 (Draft Standard) and many others

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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

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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

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SNMP Status - version 3 (continued)

- SNMPv2 Protocol Operations
 - ◆ Improved error codes, exceptions
 - ◆ GET, GETNEXT, GETBULK
 - ◆ SET
 - ◆ GETRESPONSE
 - ◆ TRAPv2, INFORM
- SMIv2 data types
 - ◆ Textual Conventions
 - ◆ Conformance
 - ◆ MIBs in SMIv2 format

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SNMP Status - version 3 (continued)

- SNMPv3 - Draft Standard
 - ◆ RFC2070 - Introduction (Informational)
 - ◆ RFC2071 - Architecture
 - ◆ RFC2072 - Message Processing
 - ◆ RFC2073 - Applications
 - ◆ RFC2074 - User Based Security Model
 - ◆ RFC2075 - View-Based Access Control Model
 - ◆ RFC1905 - Protocol Operations
 - ◆ RFC1906 - Transport Mappings
- SMIv2 - (Full) Internet Standard (STD 58)
 - ◆ RFC2578 - SMIv2
 - ◆ RFC2579 - Textual Conventions for SMIv2
 - ◆ RFC2580 - Conformance Statements for SMIv2

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SNMP Status - version 3 (continued)

- Various MIBs (Draft Standard)
 - ◆ RFC1907 - SNMPv2 MIB
 - ◆ RFC2571 - SNMP-FRAMEWORK-MIB
 - ◆ RFC2572 - SNMP-MPD-MIB
 - ◆ RFC2573 - SNMP-TARGET-MIB
 - ◆ SNMP-NOTIFICATION-MIB
 - ◆ SNMP-PROXY-MIB
 - ◆ RFC2574 - SNMP-USER-BASED-SM-MIB
 - ◆ RFC2575 - SNMP-VIEW-BASED-ACM-MIB
 - ◆ and many others
- SNMP Co-existence - Proposed Standard
 - ◆ RFC2076 - SNMP-COMMUNITY-MIB

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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/>

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IETF – Current NM Activities 1/5

- Ongoing work SNMPv3 WG
 - ◆ advance SNMPv3 to Full Internet Standard
- SNMPCONF WG
 - ◆ Configuration Management with SNMP
 - ◆ Policy-Based Network-Wide Configuration Management
- SMInG WG - Next Generation of SMI
 - ◆ More Object Oriented
 - ◆ Merge SPPI and SMI
- EOS WG - Evolution Of SNMP
 - ◆ Performance Enhancements
 - ◆ Within SNMP Architecture (RFC2571)

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IETF – Current NM Activities 2/5

- DISMAN WG - Distributed Management
 - ◆ Advance various MIBs to Draft Standard
 - ☞ Remote Operations (Ping, Traceroute, dnslookup)
 - ☞ Script and Scheduling MIBs
 - ☞ Expression, Event and Notification Logging MIBs
 - ◆ New ALARM MIB
- RMONMIB WG - Remote Monitoring
 - ◆ Advance RMON1 and RMON2 MIBs to Full Standard
 - ☞ Including high capacity versions
 - ◆ APM MIB (Application Performance Monitoring)
 - ◆ DSMON MIB (Diffserv Monitoring)
 - ◆ etc

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IETF – Current NM Activities 3/5

- IPv6 MIB Design Team
 - ◆ INET-ADDRESS-MIB
 - ☞ IPv4 and IPv6 Friendly
 - ◆ IANA-TADDRESS-MIB
 - ☞ IPv4 and IPv6 friendly, SNMP neutral
 - ◆ Various MIBs for IPv4 and IPv6
 - ☞ UDP-MIB, TCP-MIB
 - ☞ IPv6 related MIBs
- Various MIBs – O&M Area and most other Areas
- IRTF Services Management RG
- IRTF Network Management RG

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IETF – Current NM Activities 4/5

- AgentX WG - Extensible Agents
 - ◆ IETF Standards Track
 - ☞ AgentX is Proposed Standard, RFC 2741
 - ☞ AgentX MIB is Proposed Standard, RFC2742
 - ◆ IETF Experimental/Historic
 - ☞ SMUX (Historic) - RFC 1227
 - ☞ DPI (Experimental) - RFC 1592
 - ◆ Proprietary
 - ☞ SNMP Research Emanate
 - ☞ Others

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IETF – Current NM Activities 5/5

- IETF MIB Activities
 - ◆ In protocol or application WG
 - ◆ Some generic ones in O&M Area
- Other standard bodies MIB Activities
 - ◆ IEEE
 - ◆ ITU
 - ◆ Others
- In other Forums and Private MIB Activities
 - ◆ Enterprise MIBs
 - ◆ SAN,
 - ◆ etc

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Other NM Activities in IETF

- AAA WG
 - ◆ Authentication, Authorisation, Accounting
 - ◆ Focus on NAS, MobileIP, Roaming
 - ◆ Selected DIAMETER as base protocol
 - ◆ Working on specification for Proposed Standard

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Other NM Activities in IETF

- Policy Framework WG
 - ◆ Policy Core Information Model
 - ☞ Proposed Standard (RFC3060)
 - ◆ Policy Core Information Model Extensions
 - ◆ Policy Core LDAP Schema
 - ◆ Policy Framework (??)
 - ◆ Policy QoS Information Model
 - ◆ Policy Device Information Model
 - ◆ Policy Terminology (approved as RFC)

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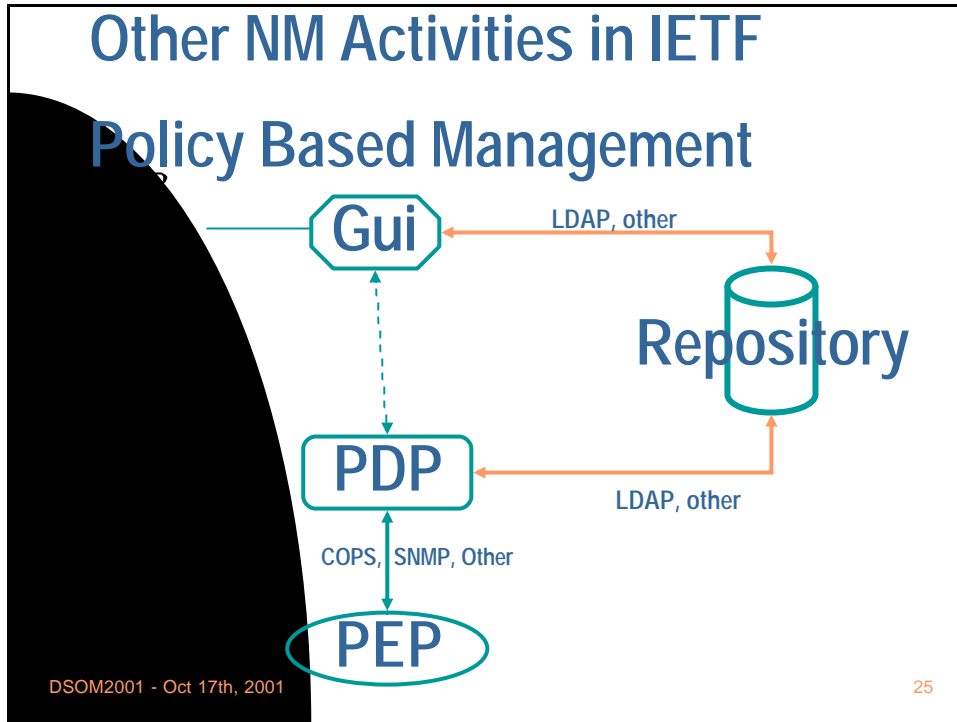
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Other NM Activities in IETF

- RAP WG - Resource Access Protocol
 - ◆ COPS
 - ☞ Common Open Policy Service Protocol
 - ☞ For Outsourcing Policy Decisions
 - ☞ Proposed Standard
 - ◆ COPS-PR
 - ☞ For Policy Provisioning
 - ☞ Proposed Standard
 - ◆ SPPI
 - ☞ Structure of Policy Provisioning Information
 - ☞ Proposed Standard
 - ◆ Base PIBs (Policy Information Base)

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- ## Other NM Activities in IETF
- New sub-IP Temporary Area
 - ◆ WGs
 - ☞ CCAMP - Common Control & Measurement Planes
 - Does SNMP apply?
 - ☞ MPLS
 - Doing quite a few MIBs
 - ☞ IPO
 - ☞ IPORPR
 - ☞ TE-WG
 - Doing a MIB for Traffic Engineering
 - ☞ PPVPN
 - ☞ GSMP
 - Includes a MIB

What do Users/Operators Want?

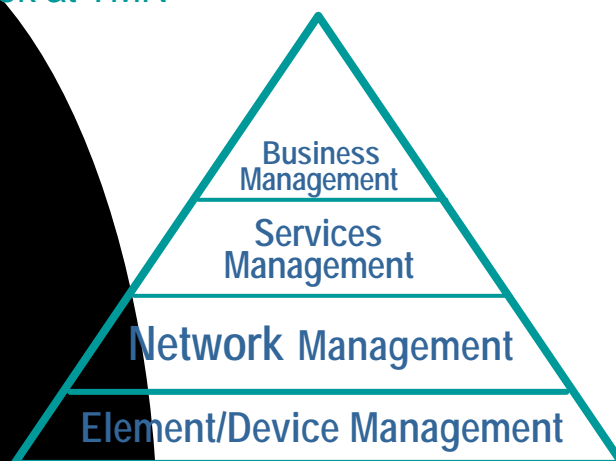
- Plain CLI
- Text based interfaces aka SMTP
- See
 - ◆ Draft-ops-operator-req-mgmt-00.txt
- We had (will have) meetings with operators
 - ◆ At IETF 50 and 51
 - ◆ At NANOG (core IP network ISPs)
 - ◆ At RIPE (IP ISPs)
 - ◆ At LISA (in December 2001, Enterprise networks?)
- Not much talk about service management

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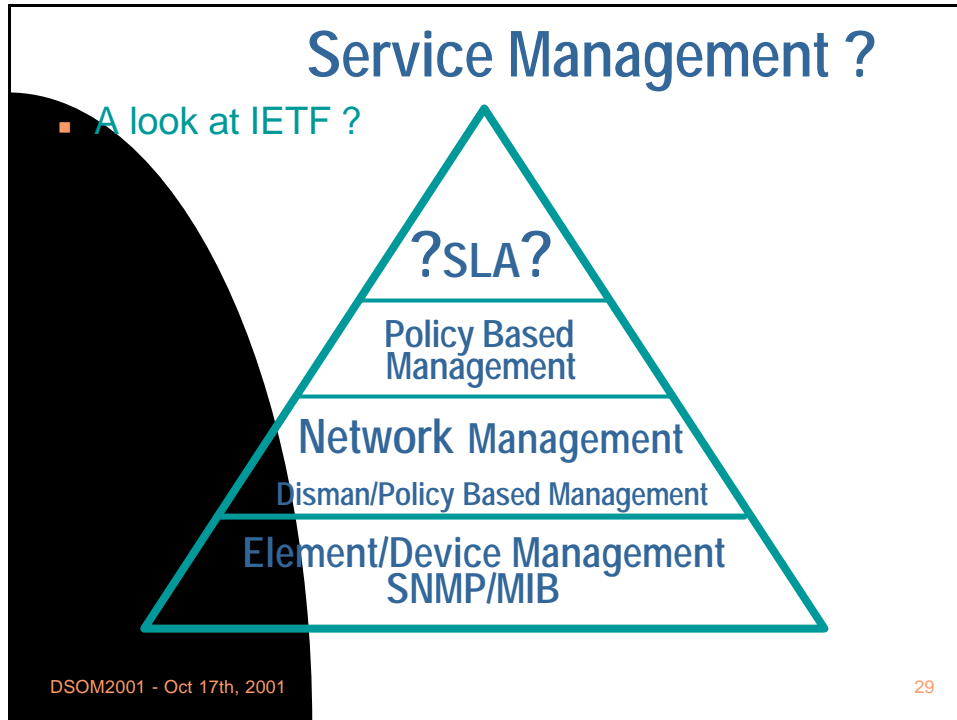
Service Management?

- A look at TMN



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Service Management?

- Do Vendors want it Standardized?
 - ◆ In fact do they want NM Protocol standards?
 - ◆ Do they want standard MIBs
 - ◆ Is there an incentive? Only for Startups?
 - ◆ Operators want std protocol and MIBs
 - ☞ Allows them to mix and match
- Do operators want Standardized SM ?
 - ◆ I am not sure
 - ◆ It may take away their competitive advantage
 - ◆ If they do... they should step up to the task
- IRTF Services Management RG

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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.org>
 - ◆ Starting point for OPS Area specific web pages

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Q&A



- Any Questions ?

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