



# **RID IETF Draft Update**

**Kathleen M. Moriarty**

**INCH Working Group**

**5 August 2004**

**This work was sponsored by the Air Force under Air Force Contract Number F19628-00-C-0002.**

**"Opinions, interpretations, conclusions, and recommendations are those of the author and are not necessarily endorsed by the United States Government."**

---

**MIT Lincoln Laboratory**



# RID Updates

---

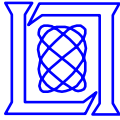
- **Purpose**
- **RID and INCH**
- **Messaging Format for RID**
- **Define Extensions to IODEF Model**
- **New Extension for Policy**
- **Communication Mechanism for RID Documents**
- **Security Considerations**



# Real-time Inter-network Defense (RID)

---

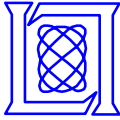
- **Trace Security Incidents to the Source**
- **Stop or Mitigate the Effects of an Attack or Security Incident**
- **Facilitate Communications between Network Providers**
- **Integrate with existing and future network components**
  - **Systems to trace traffic across a network**
    - Intrusion Detection Systems
    - NetFlow, Hash Based IP Traceback, IP Marking, etc.
    - Network devices such as routers and firewalls
- **Provide secure means to communicate RID messages**
  - **Consortiums agree upon use and abuse guidelines**
  - **Consortiums provide a key exchange method**
    - Trusted PKI, certificate repository, cross certifications



# RID and INCH

---

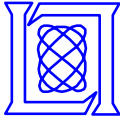
- **RID is used to communicate security incident handling information between CSIRTs or NPs**
- **RID carries much of the same data as an IODEF document**
  - RID requires a few additional data elements
- **Communication and proper transport of messages is in the RID specification**
- **RID is now reformatted to use the IODEF specification**
  - Packet based format to IODEF document
- **RID message types**
  - XML IODEF document with RID extensions
  - SOAP Wrapper
    - Message Type distinguished in SOAP wrapper and RIDPolicy



# SOAP Wrapper Input

---

- **SOAP Wrapper for Messages**
- **One way communication, but the conversation is specified by the application**
  - RID messages require responses in the form of authorization status and source found messages
  - SOAP header carries information needed by RID systems during a relay request
    - SOAP body does not need to be parsed
- **Transport would be left for other specification**
- **SOAP would be a wrapper and another protocol would be used for transport**
  - Practical - SSH
  - Other options
    - HTTPS, BEEP, SNMP, etc.
- **Are there any SOAP experts that can review the document?**



# RID Extensions to IODEF

---

- **AdditionalData Class from IODEF used to define Extensions**
  - **IPPacket Class**

Allows hex packets to be stored in the RID message in a format that will be expected by the recipient of a RID message

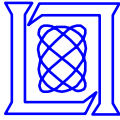
Multiple packets may be sent in a single message
  - **NPPath Class**

Purpose is to identify the path of the trace and to avoid loops
  - **TraceStatus Class**

Method for providing approval status from upstream peer after a trace request is made
  - **RIDPolicy**

Method to determine via RID messages if trace should be continued between NPs

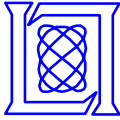
Policy negotiations for RID messages
- **Reliability of the trace type requested**
  - Some NPs may have multiple choices for traceback
  - Method needed to decide which of several methods should be used by the percentage from the originator of request
- **Level of trace required**
  - RID systems need to reference the IODEF expectation class to determine how fast of a trace mechanism should be used
  - The start time and end time can be used to determine if a fast method of tracing or a slow and more detailed trace mechanism can be used



# RID Policy

---

- **RID Policy**
  - New extension to ensure that policy information is transferred between participating RID peers
  - Policy information in RID to prevent policy related issues from relying on the transport mechanism for enforcement
  - Message type is specified here and should also be in the SOAP wrapper
- **RIDPolicy Information**
  - **Extension to define the type of trace**
    - IODEF Method and Impact class information should be considered for the type of traffic requested for trace and the success of an attack
    - Explicit statement for the type of trace requested in case it does not fit into the category of attack traffic and can be linked to a CVE or other identifier
  - **Message Type**
  - **Message Destination and Node address**
  - **Identifies where the traffic may have policy issues**
    - Client to NP
    - NP to client
    - Within a consortium
    - Between peers
    - Between consortiums
    - Across national boundaries
- **Purpose is to try to prevent abuse of the system**
  - Address security, confidentiality, and privacy concerns listed in the draft
  - New extension created to address issues raised at IETF-59

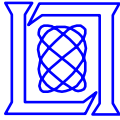


# Communicating RID Messages

---

- **SOAP Messaging Wrapper and XML Security**
  - Method to transport messages
  - Policy negotiated in RID message and not wrapper
  - Provide integrity, authentication, authorization
  - XML digital signature, encryption, and public key infrastructure
    - Encryption of RID for privacy and security reasons should be via XML encryption and not through the security provided by a wrapper or higher level protocol
  - Added a section to outline all of the encryption and digital signature options that are also in various parts of the document for clarity
- **Public Key Infrastructure**
  - Provided by consortiums linking network providers for RID messaging
- **Message Types**
  - Trace Request
  - Trace Authorization
  - Source Found
  - Relay Request
- **RID Systems Must Track the Requests by**
  - Incident Number
  - Packet Contents
  - Completion Status





# Security Considerations

---

- **Consortiums**
  - Agreements between entities involved in RID peering
  - Provide a secure key exchange repository/system (PKI)
  - Peering agreements and policies between consortiums and across national boundaries or jurisdictions
  - Policy enforced through RID messages by stating level and type of trace
- **System use guidelines**
  - Privacy considerations
  - Abuse policies
  - Use policies may vary across national network or consortium boundaries
    - Automated method to allow enforcement of use agreements
- **RID server security policies**
  - Network based access controls
  - Hardened systems
- **Communication security considerations for the exchange of RID messages and the underlying protocols**



# Summary

---

- **Updates from the previous version**
  - **Extended the AdditionalData Class to accommodate the needs of RID messaging and RIDPolicy**
    - Extended information on system use and privacy considerations
    - RID message types
    - RID message destination and Node information
  - **PKI at the core of the security model, but provided by a consortium**
  - **Summary of XML Digital Signature and Encryption applications**
  - **Topology examples to address implementers questions**
  - **XML Schema for RID extensions**
- **Near Future Updates will include**
  - **More information on XML Security**
  - **Separate document for SOAP wrapper and transport**
  - **May include additional examples of other message types**
  - **Any suggested revisions or clarifications**
- **<http://www.ietf.org/internet-drafts/draft-ietf-inch-rid-00.txt>**
- **Plan to generalize document for IODEF purposes, any input would be appreciated!**