NETCONF Over SOAP

draft-ietf-netconf-soap-00

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NETCONF/SOAP Fundamentals

- Manager initiates SOAP/HTTP connection to agent
  - Multiple SOAP/HTTP connections with the same credentials and session identifier in request-URI constitute a session
  - Multiple connections allow management of time-extended synchronous operations
  - This is not effective for asynchronous notification
    - A polling form of <rpc-progress> would be useful
    - Use reliable syslog
    - Use SOAP/HTTP from the agent to the manager
- NETCONF SOAP interface is defined in WSDL
  - Base netconf/1.0/soap.wsdl defining message types
  - Device-specific WSDL giving device address and port

Draft diff

- XSD and WSDL hosted by IANA.org

- SOAPAction no longer used for sessionID
  - use request-URI such as

    `POST /netconf/sid-123 HTTP/1.0`

- Security Considerations includes server authentication

Usage Scenario

- Configuration, not monitoring

- Customized management application
  - benefit from SOAP development tools

- Enterprise/desktop management application
  - Typicallly implemented in .NET or Java (SOAP libraries exist for most languages)
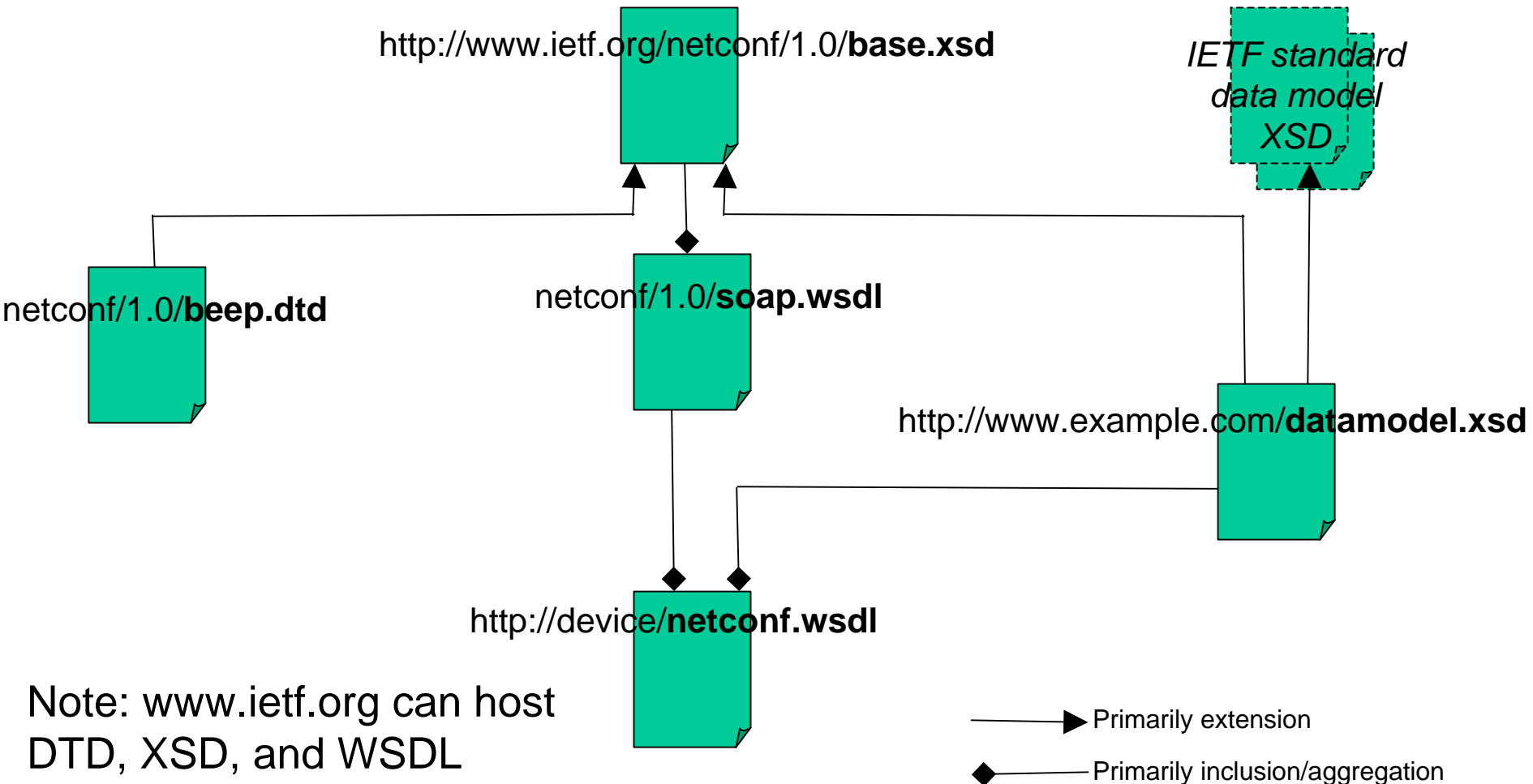
Implementation Issues

- Requires SOAP stack on both client and server

- NETCONF SOAP binding designed for code re-use with other transports
  - Requires document/literal SOAP encoding

- Embedded SOAP static footprint 100k + application

Questions

- Should the SOAP binding be "reversible"?
  - Agent behind firewall can contact manager

- What about notifications?
  - Agent initiated connection?
  - <get-notifications> in <rpc>?

- Are multiple TCP connections per session problematic?
  - This can be used to support channels

NETCONF Machine Readable Document Relationships

http://www.ietf.org/netconf/1.0/**base.xsd**

IETF standard data model XSD

netconf/1.0/**beep.dtd**

netconf/1.0/**soap.wsdl**

http://www.example.com/**datamodel.xsd**

http://device/**netconf.wsdl**

Note: www.ietf.org can host DTD, XSD, and WSDL just as it now hosts RFC

Primarily extension

Primarily inclusion/aggregation

NETCONF SOAP Request

```
POST /netconf/sid-123 HTTP/1.0
Content-Type: text/xml; charset=utf-8
Content-Length: 470
```

```xml
<?xml version="1.0" encoding="UTF-8"?>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
  <soapenv:Body>
    <rpc id="101" xmlns="http://ietf.org/netconf/1.0/base">
      <get-config>
        <source> <running/> </source>
        <config xmlns="http://example.com/schema/1.2/config"> <users/> </config>
        <format>xml</format>
      </get-config>
    </rpc>
  </soapenv:Body>
</soapenv:Envelope>
```

NETCONF SOAP Response

```
HTTP/1.0 200 OK
Content-Type: text/xml; charset=utf-8

<?xml version="1.0" encoding="UTF-8"?>
<soapenv:Envelope
  xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
  <soapenv:Body>
    <rpc-reply id="101" xmlns="http://ietf.org/netconf/1.0/base">
      <config xmlns="http://example.com/schema/1.2/config">
        <users>
          <user>  <name>root</name>      <type>superuser</type>  </user>
          <user>  <name>fred</name>      <type>admin</type>      </user>
          <user>  <name>barney</name>  <type>admin</type>      </user>
        </users>
      </config>
    </rpc-reply>
  </soapenv:Body>
</soapenv:Envelope>
```