NSCP

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About Us

- Sinodun IT is a UK based research and development company primarily focussed on open internet protocols.
- Our expertise includes DNS, DNSSEC, system administration and software development.
- Heavily involved in the design of OpenDNSSEC.
- You can find us at IETF (DNSEXT & DNSOP WGs), RIPE, CENTR....

NSCP

- Problem Statement
- Requirements
- Possible Solution
- Use Cases

DNS Operations

- DNS needs high availability.

- Good practice suggests that name server software from a range of vendors should be used to help achieve this.

Do you do this?

DNS Operations

- Genetic diversity is good but all tools are different - proprietary solutions used:
  - rndc
  - cfengine
  - puppet
  - ssh
  - lots of perl ducktape?

DNS Management

- 3 years ago the IETF DNSOP WG felt there was a clear need for a common DNS (SEC) name server management and control system.

- http://tools.ietf.org/id/draft-ietf-dnsop-name-server-management-reqs-05.txt

NSCP Draft

- There is a internet draft describing a Name Server Control Protocol (NSCP).
- Meets all the requirements.
- http://tools.ietf.org/id/draft-dickinson-dnsop-nameserver-control-02.txt
- NSCP is intended to be a single cross platform, cross implementation control protocol for name servers.

NSCP Draft - Status

- 00 draft - 2008
- 02 draft - March 2011
- Dickinson (Sinodun), S. Morris (ISC), R. Arends (Nominet)

NSCP Draft - Content

- -00 covered the data model as well as its transport layer and modelling language.
- In order to concentrate on the data model we removed the transport layer and modelling language from -02 version of the draft.
- We intend to re-add them once the data model is finalised.

NSCP Draft - Content

- The -02 version of the draft is currently targeted at a minimal data model for a *DNSSEC enabled authoritative server.*

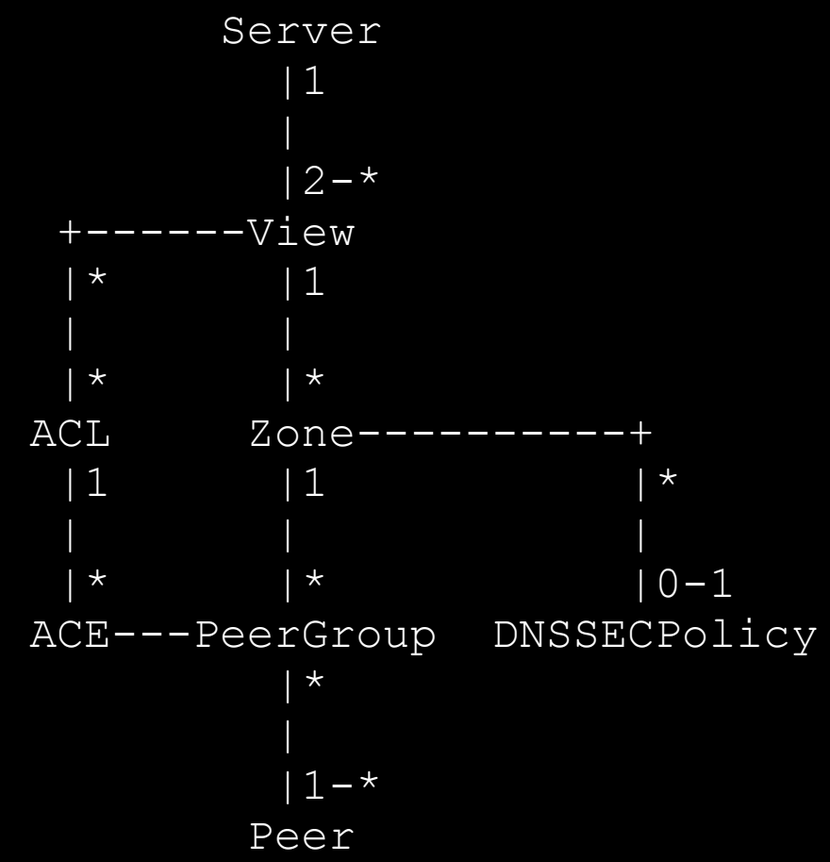
- Does not to have every BIND feature!
- Resolvers are saved for the future.
- Monitoring: as well as configuration information the data model also supports statistics gathering.

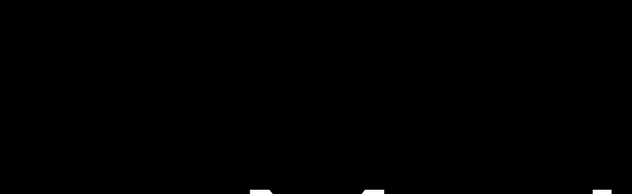
NSCP Deployment

- Initial deployment is likely to rely on agents running on name servers.
- One day we hope to see NSCP built in to the name server.

NSCP Data Model

Currently concentrating on minimal requirements.





NSD

BIND

PowerDNS

Zone content

- NOTE! The draft does not include any support for zone content management.
- Zones are a version control or database issue but NSCP will
  - configure a URL to specify the zone file
  - obtain and load zone

  or
  - configure dynamic updates

NSCP Data Model

FEEDBACK PLEASE!

- We are very keen to receive feedback on the core NSCP data model. Does it provide the minimum you need to configure authoritative server?

- Please respond on IETF DNSOP WG list or direct to jad@sinodun.com

NSCP Transport Layer

- -00 draft suggested using NETCONF (RFC4741) as the control channel as well as the transport and manipulation layer for the data model.
- Data model was written in a formal modelling language known as YANG (RFC6020).

NETCONF

- NETCONF IS SECURE:

  Establishes a session with a server via a secure, connection-oriented transport mechanism (such as SSH).

- NETCONF IS READABLE:

  Messages and data are encoded in XML realised on top of a simple Remote Procedure Call (RPC) layer.

NETCONF Extensibility

- NETCONF IS EXTENSIBLE:

  This will ensure the protocol can support all the features of any name server via vendor specific or other open source extensions.

- Extensibility is achieved via the concept of capabilities which are agreed during session setup.

NETCONF

FEEDBACK PLEASE!

- Does NETCONF provide you with the control and extensibility needed?

- Please respond on IETF DNSOP WG list or direct to jad@sinodun.com

NSCP Implementation

- So..... NSCP is concerned with configuration and control of a single name server.

- But.... any *useful* tool should ideally address higher level requirements regarding management of multiple name servers in various configurations.

NSCP Implementation

FEEDBACK PLEASE!

- We are very keen to receive feedback on potential use cases from operators and name server implementors.

- We want to understand the requirements and issues effecting practical management of multiple name servers in the wild.

Use Cases

- Suggestion that use cases gathered by a independent party
  - Talking to OARC
  - Or respond on IETF DNSOP WG list or direct to jad@sinodun.com

NSCP

draft-dickinson-dnsop-nameserver-control-02.txt

Please respond on IETF DNSOP WG list or direct to jad@sinodun.com

Additional Slides

NETCONF Operations

- The base NETCONF protocol provides the following operations
  - <get-config>, <edit-config>, <copy-config>, <delete-config>, <lock>, <unlock>,<get>,<close-session>,<kill-session>

NETCONF Capabilities

- Examples of some base NETCONF capabilities are
  - Writable-Running, Candidate Configuration, Confirmed Commit, Rollback on Error and XPath.
- You can add your own. NSCP itself will be a capability and it will add other control capabilities like ‘stop’ and ‘start’.

NETCONF Example

```
<rpc message-id="101"
       xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
     <get-config>
      <source>
       <running/>
      </source>
     <filter type="subtree">
      <top xmlns="http://example.com/schema/1.2/config">
       <users/>
      </top>
     </filter>
    </get-config>
</rpc>
```

NETCONF Example

```
<rpc-reply message-id="101"
        xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
      <data>
       <top xmlns="http://example.com/schema/1.2/config">
        <users>
         <user>
          <name>root</name>
          <type>superuser</type>
          <full-name>Charlie Root</full-name>
          <company-info>
           <dept>1</dept>
           <id>1</id>
          </company-info>
         </user>
        </users>
       </top>
      </data>
</rpc-reply>
```

Use Case 1

- Should name servers be managed as groups?
  - e.g. A group of all secondary servers for co.uk
    - All the same configuration except different listen-on address.
- Subsets of name server groups
  - What if ns1 to ns5 served co.uk and ns2 and ns3 also served example.com?

Use Case 2

- Should NSCP allow zone creation and modification?
- I think zones are a version control or database issue. NSCP should just allow you to tell the name server the URL where is can checkout the zone.

Use Case 2

- On master servers it could allow the creation of a SOA RR and 1 NS RR in order to allow dynamic updates to work.
- Large amounts of RR's should not be transferred over NSCP.
- Or am I wrong?

Use Case 3

- Do you want “Minority Report GUI”, regular GUI, Web frontend, CLI or API?