Status and Issues for the “Client-Server” Suite of Drafts

draft-ietf-netconf-crypto-types-05
draft-ietf-netconf-trust-anchors-03
draft-ietf-netconf-keystore-08
draft-ietf-netconf-ssh-client-server-11
draft-ietf-netconf-tls-client-server-10
draft-ietf-netconf-netconf-client-server-10
draft-ietf-netconf-restconf-client-server-10

Adopted

+

draft-kwatsen-netconf-tcp-client-server-00
draft-kwatsen-netconf-http-client-server-00

Not Yet Adopted

NETCONF WG

IETF 104 (Prague)

Since IETF 103

All drafts updated and submitted as a set

Progress made on the two issues discussed before:

1. Finalizing the "crypto-types" identities.
2. Adding support for TCP Keep-alives.

This presentation focuses on these two issues

- plus a few additional issues that have surfaced....

Begin discussion #1

Finalizing the "crypto-types" Identities.

Updates to Crypto Types Draft

(From the Change Log)

- Renamed base identity 'asymmetric-key-encryption-algorithm' to 'asymmetric-key-algorithm'.
- Added new 'asymmetric-key-algorithm' identities for secp192r1, secp224r1, secp256r1, secp384r1, and secp521r1.
- Removed 'mac-algorithm' identities for mac-aes-128-ccm, mac-aes-192-ccm, mac-aes-256-ccm, mac-aes-128-gcm, mac-aes-192-gcm, mac-aes-256-gcm, and mac-chacha20-poly1305.
- For all -cbc and -ctr identities, renamed base identity 'symmetric-key-encryption-algorithm' to 'encryption-algorithm'.
- For all -ccm and -gcm identities, renamed base identity 'symmetric-key-encryption-algorithm' to 'encryption-and-mac-algorithm' and renamed the identities to remove the "enc-" prefix.
- For all the 'signature-algorithm' based identities, renamed from 'rsa-*' to 'rsassa-*'.
- Removed all of the "x509v3-" prefixed 'signature-algorithm' based identities.
- Added 'key-exchange-algorithm' based identities for 'rsaes-oaep' and 'rsaes-pkcs1-v1_5'.
- Renamed typedef 'symmetric-key-encryption-algorithm-ref' to 'symmetric-key-algorithm-ref'.
- Renamed typedef 'asymmetric-key-encryption-algorithm-ref' to 'asymmetric-key-algorithm-ref'.
- Added typedef 'encryption-and-mac-algorithm-ref'.

Questions

Currently in in the crypto-types draft, we have defined following identities for crypto and mac algorithms:

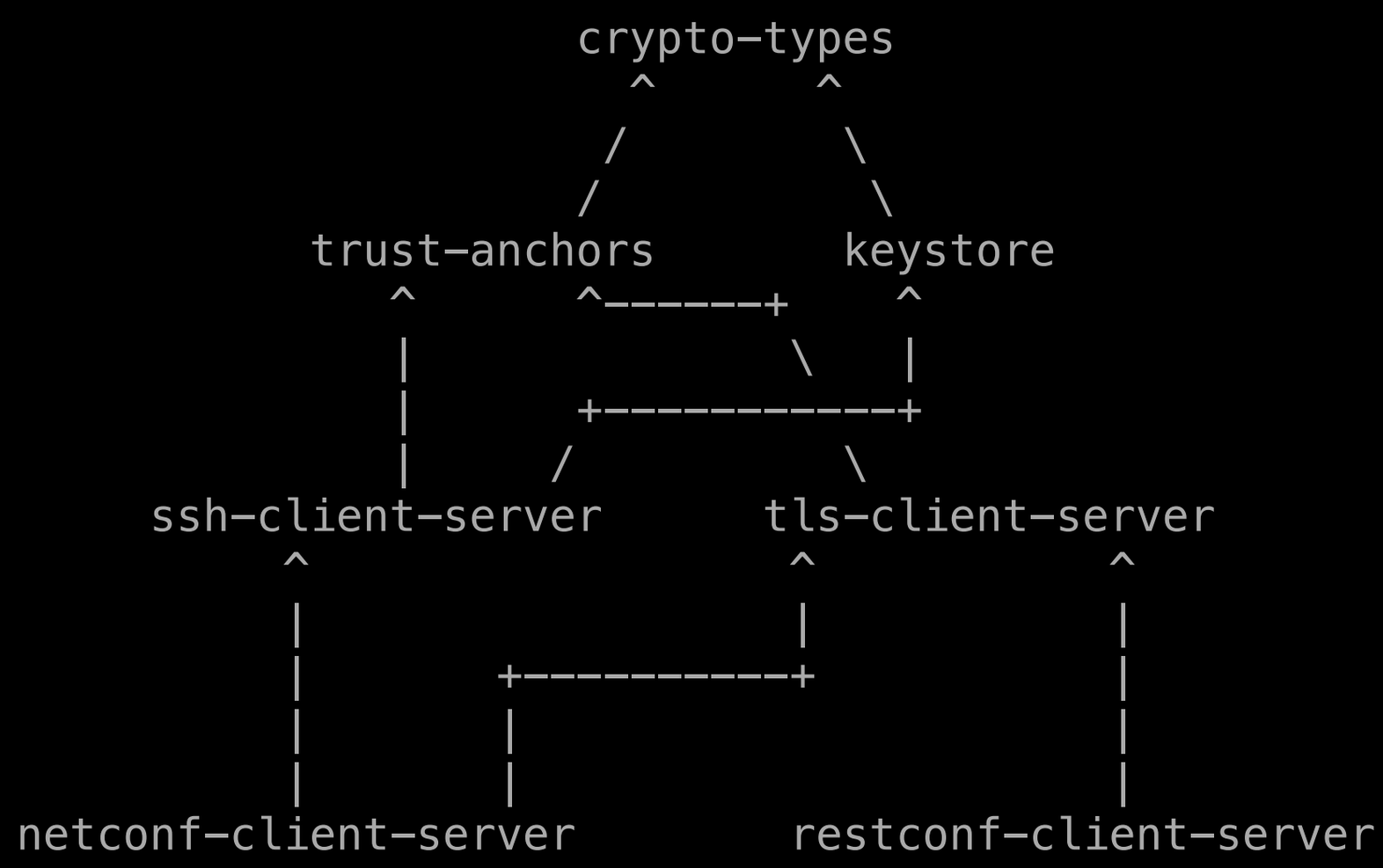
- hash-algorithm
- asymmetric-key-algorithm
- mac-algorithm
- encryption-algorithm
- encryption-and-mac-algorithm
- signature-algorithm
- key-exchange-algorithm

1. Is there any suggestion to the classification of the algorithms?
2. Is there new category to be added in the classification?

Begin discussion #2

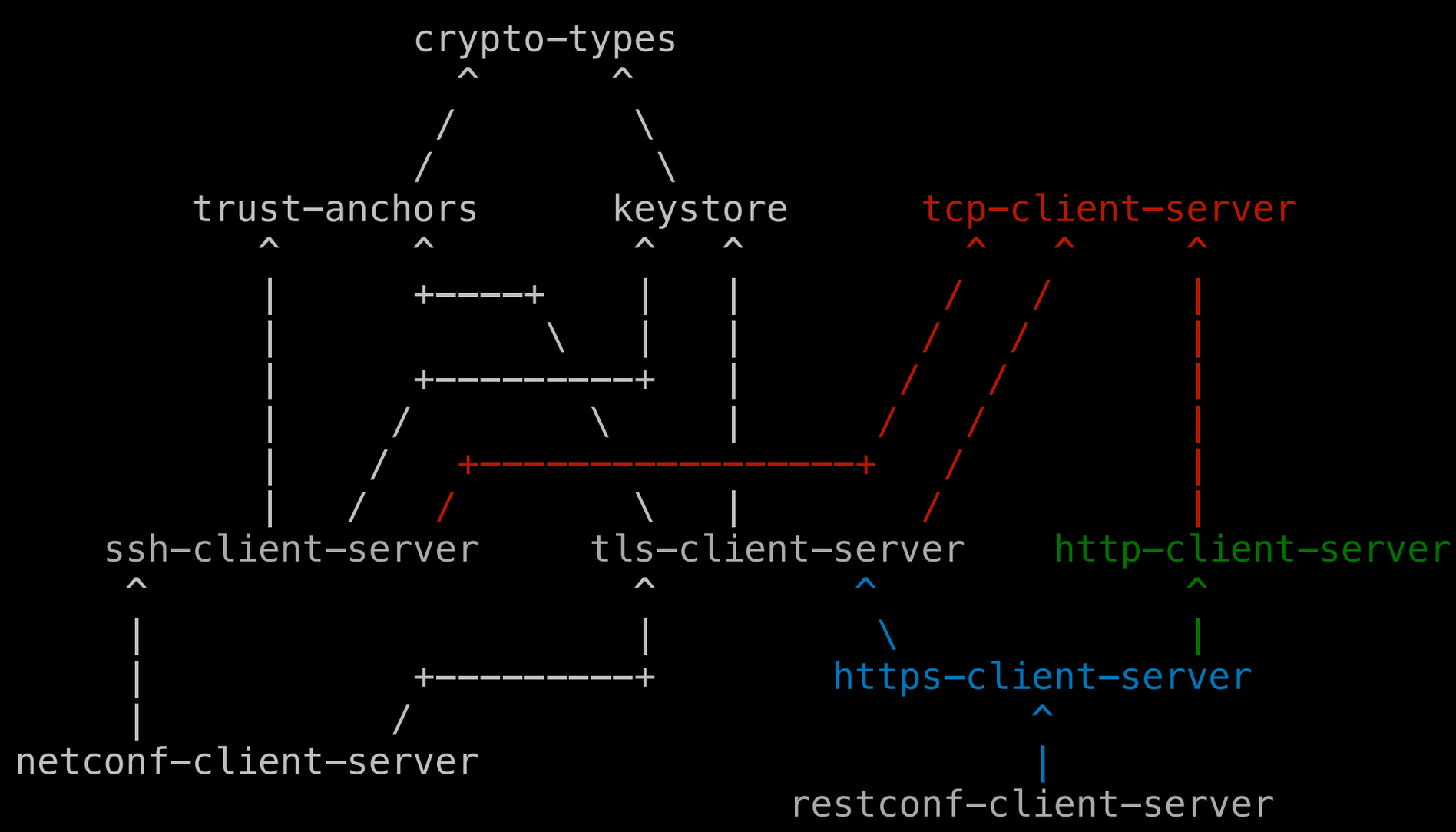
Adding support for TCP Keep-alives.

Current Adopted Solution

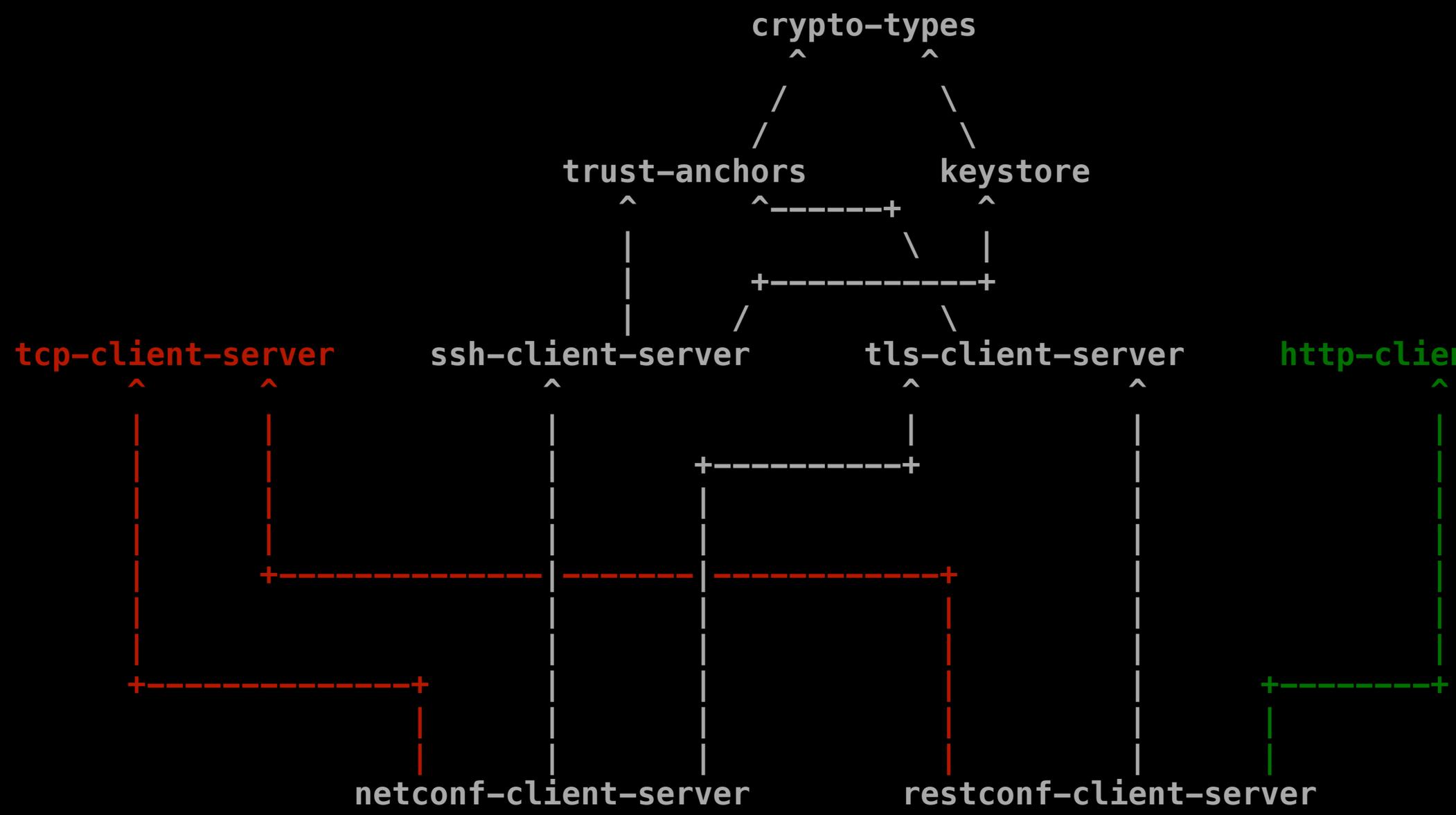


Previously Discussed Proposal

Adding in the missing tcp/http/https-client-server Layers



Current/Published Proposal



The Good

Has-a (not Is-a)

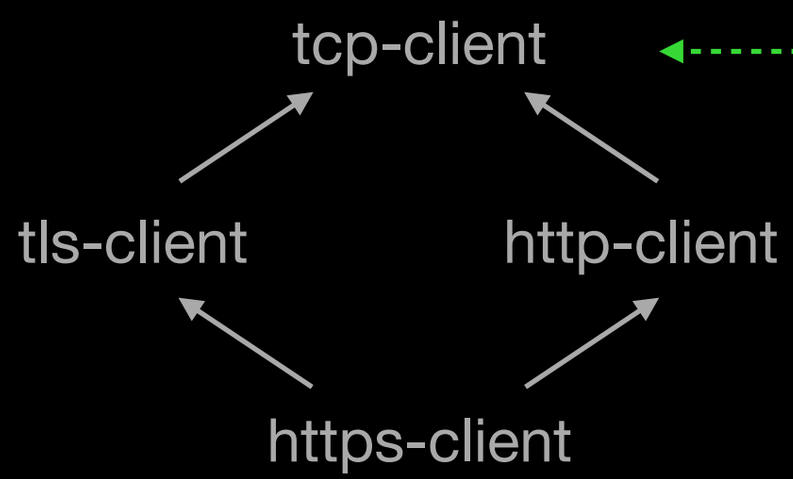
1. Enables application-level models to compose stack via 'uses' statements.

HTTP Client
uses tcpc:tcp-client-grouping
uses httpc:http-client-grouping

HTTPS Client
uses tcpc:tcp-client-grouping
uses tlsc:tcp-client-grouping
uses httpc:http-client-grouping

HTTPS Call Home Client
uses tcps:tcp-server-grouping
uses tlsc:tcp-client-grouping
uses httpc:http-client-grouping

2. Avoids "devil diamonds"
   - Multiple-inheritance problem where based class is used twice
   - Example:



TCP base instantiated twice!
(*current proposal avoids this issue*)

The Bad

Top-level groupings nodes are in same namespace

- thus names may conflict!

In order to demux node names, either:

1. Prefix the top-level nodes: (current approach, mostly...)

```
grouping tcp-client-grouping {
  leaf remote-address {...}
  container tcp-keepalives {...}
  anydata tcp-foo {...}
}
```

```
grouping tls-client-grouping {
  container tls-keepalives {...}
  anydata tls-bar {...}
}
```

```
grouping http-client-grouping {
  container http-keepalives {...}
  anydata http-baz {...}
}
```

2. Wrap everything in a prefixed container:

```
grouping tcp-client-grouping {
  container tcp-client-params {
    leaf remote-address (...}
    container keepalives {...}
    anydata foo {...}
  }
}
```

```
grouping tls-client-grouping {
  container tls-client-params {
    container keepalives {...}
    anydata bar {...}
  }
}
```

```
grouping http-client-grouping {
  container http-client-params {
    container keepalives {...}
    anydata baz {...}
  }
}
```

The Ugly

Should the NC/RC models also follow the "Has-A" pattern?

- Do we care about possible protocols built on top of NC/RC?
- Presumably we'd isolate that which is configured per-socket/session, from the larger multi-socket/session model supporting, e.g., "listen" and "call-home"
- Both could be in same draft by:
  1. Factor-out the inner per-session data models to their own groupings
     - Let these have the, e.g., "ietf-netconf-client-grouping" names
  2. Rename the original/larger models to something more appropriate:
     - e.g. "ietf-netconf-client-application-grouping"

Thoughts?

Begin discussion #3

Other Issues that have Surfaced...

And Other Issues

1. Protocol specific parameters are per-socket (redundant)
   - E.g., TCP keepalive must be set for each client/server
   - To be fair, this is inherent in any list of like-items
   - Proposed fix: do nothing, wait for a TBD templating mechanism
     - YANG-Next Issue #18 (importance-med, backcompat-high, complexity-high)
       - I.e. Juniper's "apply-groups" statement

2. Keepalive config MAY be present for "periodic" connections
   - We previously removed keepalives from periodic config...
   - Proposed fix: add "must not" expressions...

More Other Issues

3. Are all the protocol-specific keepalives models correct?
   - TCP is okay (model after POSIX), but what about the others?
4. Any desire for other protocol-specific config?
   - e.g., HTTP proxy settings
5. Not all HTTP auth schemes are defined

```
container hoba {       // FIXME
  description
    "The 'hoba' HTTP scheme credentials.";
  reference
    "RFC 7486: HTTP Origin-Bound Authentication (HOBA)";
}
```

6. Why do we have breakout groupings again?

```
grouping ssh-client-grouping {
  uses client-identity-grouping;
  uses server-auth-grouping;
  uses transport-params-grouping;
  uses keepalives-grouping;
}
```

7. TLS draft references obsolete RFCs! TLS 1.0, 1.1, 1.2
   - needed?

🙏 Thanks for the input! ☺️