

I2RS Yang Extensions

draft-rfernando-yang-data-mods

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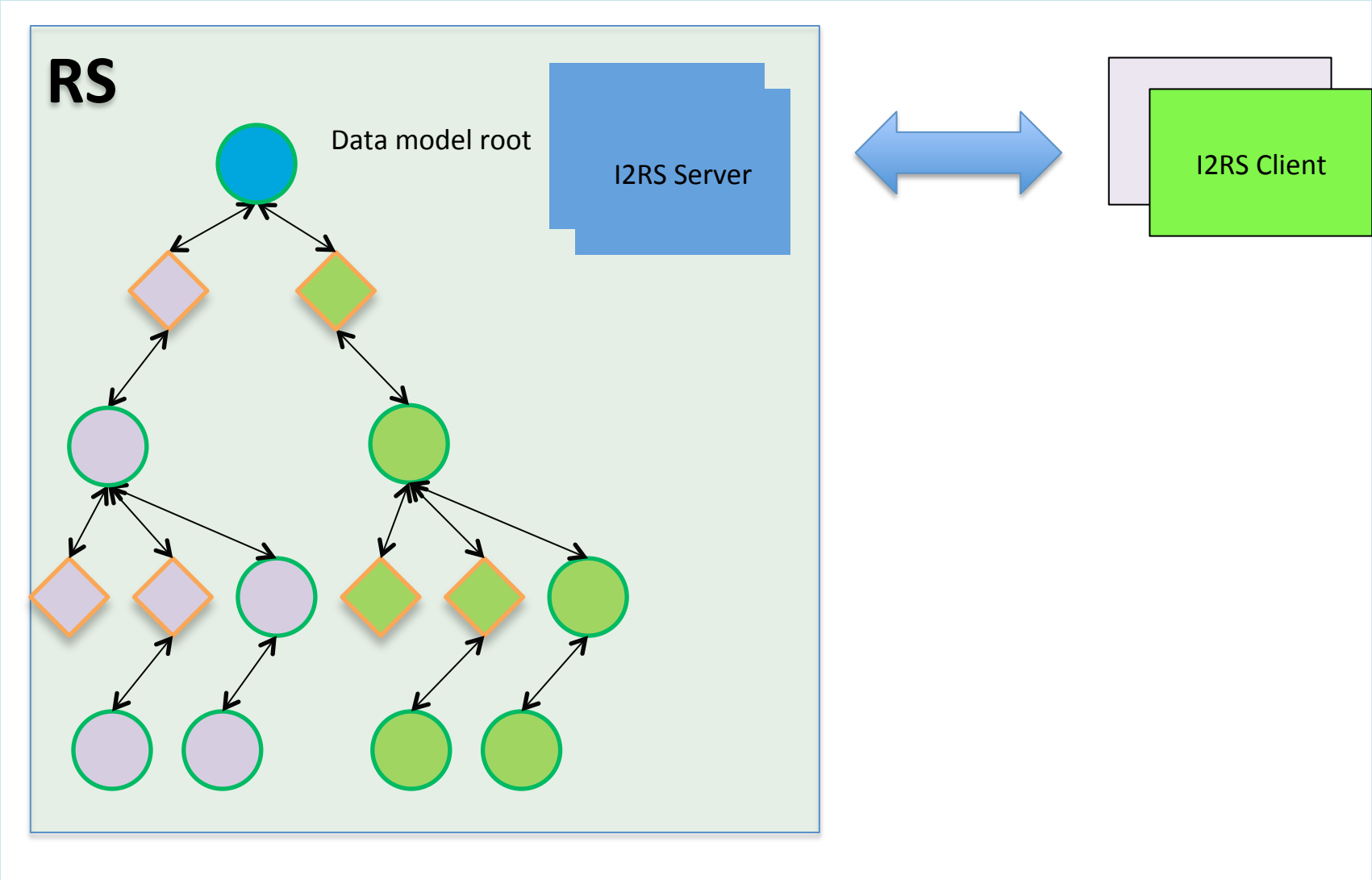
I2RS Requirements on Data modeling

- I2RS framework requirements document (draft-rfernando-irs-framework-requirement-00) calls for data model based approach.
- I2RS:
 - shall define the modeling language for specifying a SDM (G5, S1).
 - provide state access which is structured as per the SDM. (G4)
 - shall express relationship, be extensible and reference other data models, (S2, S6, S7).
 - support a generic API set that is SDM independent. (A.5, S2, S4)
- Service and SDM section define additional requirements (S8, S9, S12, S16)

Yang Data modeling properties

- NETMOD/NETCONF Data Modeling Language [RFC6020],
 - Used for modeling configuration and runtime states in a RS.
 - Adequate constructs for data organization(containers, lists, leaf-lists and leafs etc.)
 - Promotes model separation, factorization and reuse (Includes, Imports, Grouping and Uses etc.).
 - Version management and model enhancements with backward compatibility
 - supports variety of meta data information that could be translated into information model.
 - can be translated into other models like UML or encoded in XML, EXI, Protocol Buffers etc.
- Yang data modeling language meets most of I2RS requirements on SDM.

I2RS Operation flow



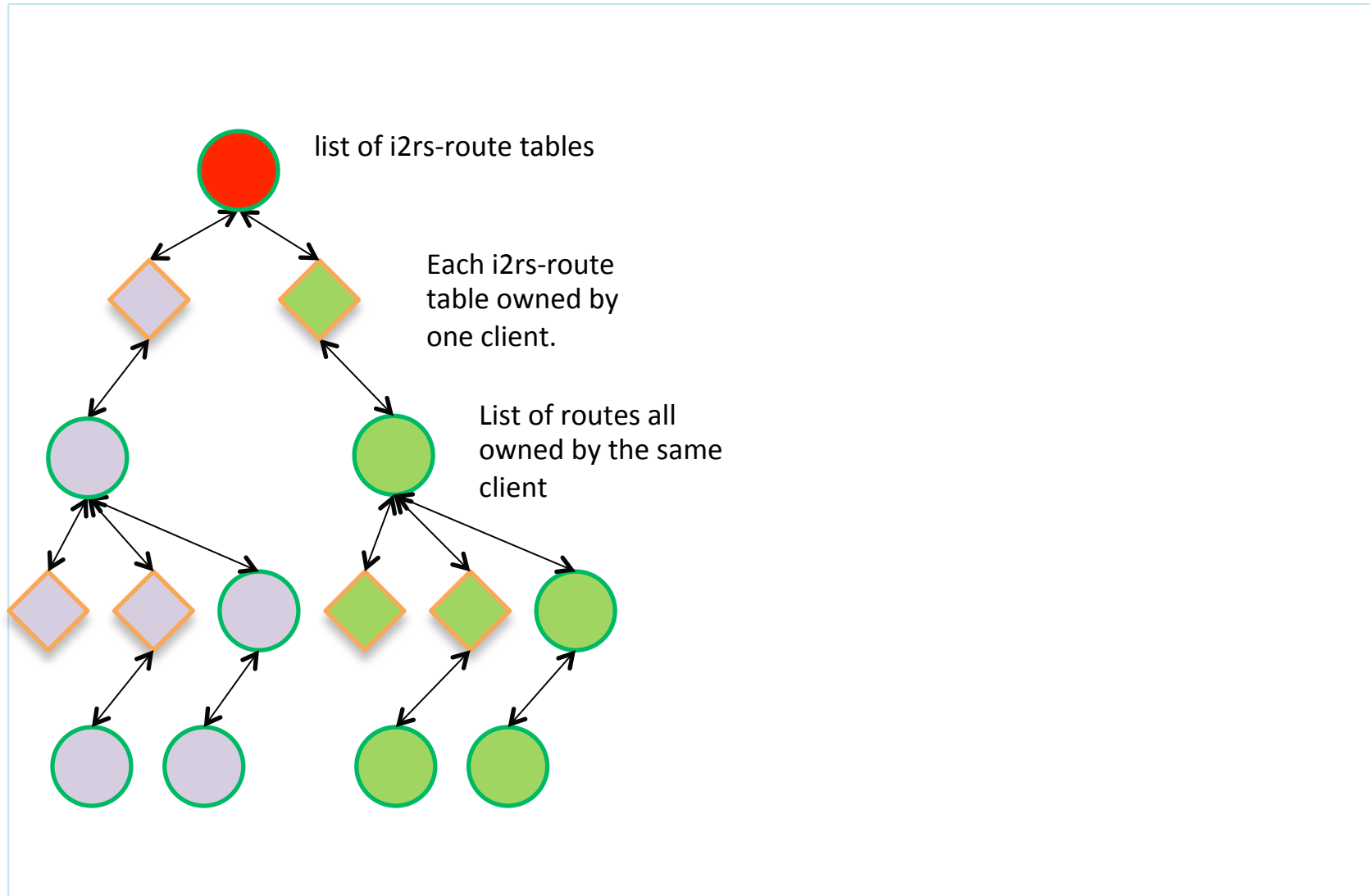
Yang modifications required

- A mechanism to capture the data ownership of a data set injected by I2RS clients (exclusivity property)
- A mechanism to express multi-client semantics and operations on a data model (canonical client name)
- A mechanism that determines the life time scope of the client data set (ephemeral data)

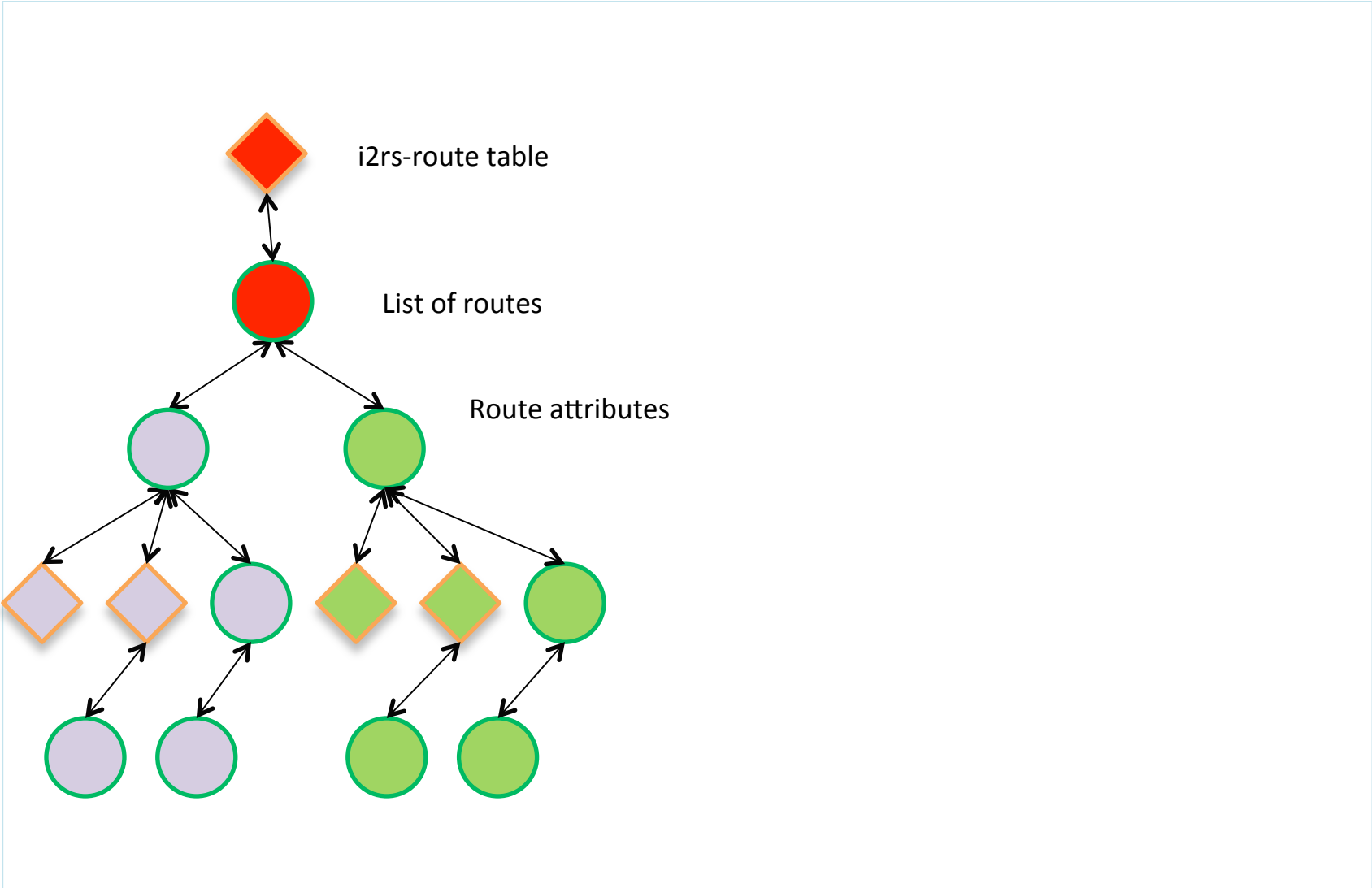
Exclusive Ownership

- Guarantees that a data node and the associated sub-tree to be exclusively owned by a client.
- Only exclusive owner can modify (others can only retrieve)
- Enables the data model to support the following properties:
 - Exclusive table.
 - Exclusive row.
 - Exclusive cell.
 - A combination of the above three schemes.

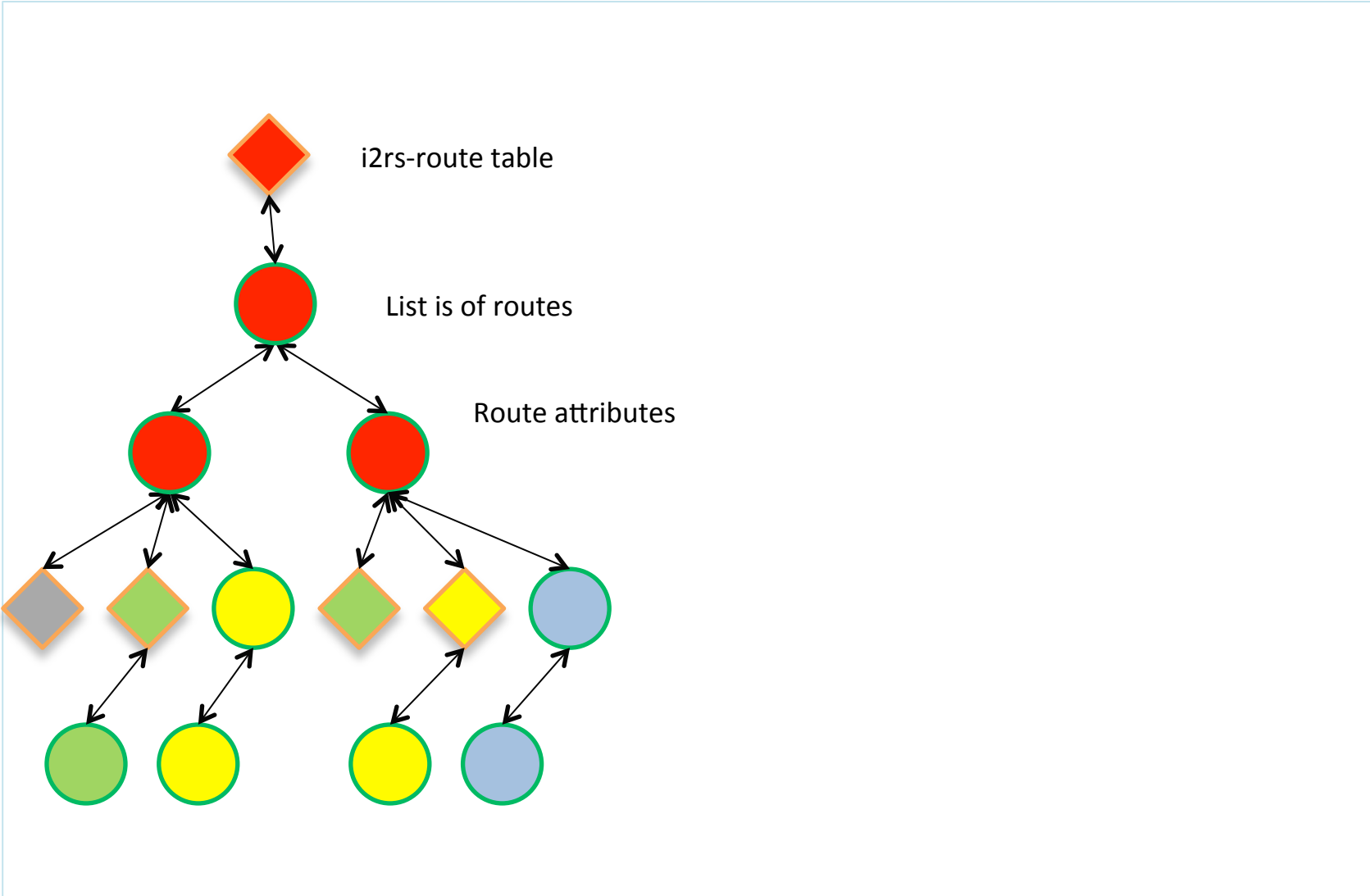
Exclusive Table



Exclusive Row



Exclusive Cell



Canonical Client Name (cname)

- Identifies the owner of a data item in a data model
- Value references a record in the NACM data model.
- The NACM Server in the domain provides the client authentication, authorization and access privileges.
- Specified in sub-trees that require exclusive ownership of data.
- Constructed using the following rules:
 - Explicit list node with the single cname key
 - Additional cname key for list items.

Ephemeral Sub-Tree

- Ephemeral statement takes one boolean argument that is either 'true' or 'false'
- Specified at any place in the data model and is inherited by all the descendent nodes.
- Indicates that the associated data model sub tree is editable by a client.
- This sub tree may not be converted into configuration sub tree.
- The sub tree may be converted to operational sub tree.

Ongoing Work not covered in the draft

- High availability mechanisms for reconnecting clients to synchronize with the I2RS.
- Iterators for data store data and data model schema
- On the wire Binary encoding of the data model content
- Bulking and and batching of data retrieved/notified.
- Dynamic capability exchange

Ask

- Adopt Yang as I2RS data modeling language
- Adopt this work as starting point for I2RS data model evolution
- Join the authors, help us to move this in the right direction