A YANG Data Model for Time Variant Link Availability

draft-kinzie-tvr-link-availability-00
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Objectives

• Support network control with predicted links
• Distributed control plane - A controller configures routers with the availability list and predicted link properties influence IGP
• Centralized control plane - A controller which includes a PCE more directly affects computed paths.
Overview

• YANG module that describes when links can be used
• Describes some common link attributes
• Complements a network topology
• Used when
  • Links are predictably available / not available
  • Link attributes may change over time
  • Neighbors may change over time
• Assist with resource planning
Usage

• Availabilities list is updated on an on-going basis.
  • Time of next scheduled update included
• List is provided to routing system
• Recipient may, in some cases, replace predicted link attributes with measured values
• Link attributes may be used as values in existing IGP metrics and updated according to availability list
• . . . or as source data for time variant IGP metrics.
Resource Planning

• Make before break
• Avoid “unstable” links
• Example: choose path based on predicted availability
Structure

module: ietf-link-availability
    +--ro link-availability
        +--ro next-update?   yang:date-and-time
        +--ro link* [avail-from source-node source-link-id]
            +--ro avail-from   yang:date-and-time
            +--ro source-node   string
            +--ro source-link-id  string
            +--ro destination-node? string
            +--ro avail-until?  yang:date-and-time
            +--ro bandwidth?    te-types:te-bandwidth
            +--ro delay?        uint32
            +--ro igp-link-metric? uint32
            +--ro te-default-metric? uint32
            +--ro link-affinity-names
                |   +--ro link-affinity-name* [usage]
                |       +--ro usage    identityref
                |       +--ro affinity-name* [name]
                |           +--ro name string
                +--ro link-srlgs-names
                    +--ro link-srlgs-name* [usage]
                        +--ro usage identityref
                        +--ro names* string
Topics for Future Consideration

• The contents of source-node and destination-node are not well defined.
• Additional link attributes?
  • expected power dissipation?
• Order list by source-node, source-link and then time? [Acee]
• It may be inefficient to represent link availabilities for a variable node, as the node itself can be powered on/off. [Sandy]
• Indicating node by prefix can reduce duplicated data [Sandy]
• A subset of elements in a variable node can be represented by a prefix [Sandy]
Next Steps

• Solicit and address feedback from the WG
  • Use cases – are there others?
  • Feed back on this solution

• Complimentary TVR draft
  • draft-qu-tvr-schedule-yang-00
  • Work with authors on a combined draft
  • Slides describing possible path forward following both draft discussions