ANCP Topology Discovery and Traffic Monitoring Overview

This topic describes ANCP as a means to monitor and modify subscriber traffic in the access network.

Access Node Control Protocol (ANCP) acts as a control plane between a service-oriented layer 3 edge device and a layer 2 access node. Queuing and scheduling mechanisms for subscriber traffic must avoid congestion within the access network while contending with multiple flows and distinct CoS requirements. These mechanisms require the edge device—a network access server (NAS)—to provide information about the access network and subscriber traffic.

The NAS uses topology discovery to get this information from the access node, typically a DSL access multiplexer (DSLAM). The information includes:

- Topology of the access network
- DSL line state
- Actual upstream and downstream net data rates of a synchronized DSL link
- Maximum attainable upstream and downstream net data rates
- Interleaving delay

The NAS receives the service profile for the subscribers from a RADIUS server. Most of the services are enforced by the NAS itself. The NAS shapes the aggregate egress traffic to subscribers based on the local loop throughput reported by the DSLAM. This traffic shaping optimizes traffic flow while avoiding traffic drops in the access node.

Some service attributes, such as interleaving delay and multicast channel information, are enforced at the access node. ANCP provides the line configuration mechanism that the edge device can use to pass the line configuration on to the access nodes. Typically multiple profiles are provisioned on the access node. The NAS instructs the access node which profile to use for a given subscriber.

Subscribers typically receive some combination of voice, data, and video services. Each service can be provisioned on a VLAN. A subscriber might receive only a single service over a single VLAN configured on a logical interface. A group of VLANs carrying services to a subscriber is an *interface set*. Subscribers are identified based on the unique access identifier that is configured on the access node through which they receive traffic. You must configure this access identifier to associate it with the logical interface or interface set. When ANCP receives a port management message from an access node, it uses the access identifier contained in the message to determine which logical interface or interface set corresponds to the subscriber.

You can configure a logical interface by specifying the interface name at the [edit protocols ancp interfaces] hierarchy level. Include the access-identifier statement when you do so to associate the access identifier with the interface. You can configure an interface set by including the interface-set statement at the [edit protocols ancp interfaces] hierarchy level. Associate the access identifier with the interface set by including the access-identifier statement at the [edit protocols ancp interfaces

interface-sets *interface-set-name*] hierarchy level. Because the access identifier must be unique for a given neighbor, you must also include the neighbor statement wih the access-identifier statement in both cases.

Some access nodes might not be running the current IETF implementation of ANCP. Instead, they run an earlier version. You can enable ANCP to operate in backwards-compatible mode with all neighbors by including the pre-ietf-mode statement at the [edit protocols ancp] hierarchy level.

You can control how many discovery table entries are accepted from any neighbor by including the maximum-discovery-table-entries statement at the [edit protocols ancp] hierarchy level.

When you include the qos-adjust statement at the [edit protocols ancp] hierarchy level, ANCP updates CoS based on monitoring the subscriber traffic. CoS can adjust the traffic shaping rate that it applies to a particular VLAN or set of VLANs to avoid traffic drops in the access node. ANCP can affect only the shaping rate. When ANCP removes a shaping rate that it previously applied, then the traffic shaping rate reverts to that configured in the CLI. If ANCP remains running but loses a connection to a particular neighbor whose subscriber traffic is adjusted as a result of ANCP, the adjusted rate remains in effect. The rate changes only if ANCP restores the connection and sends fresh updates to CoS, or if you remove the qos-adjust statement.

ANCP sends a keepalive message to CoS at specific intervals. If CoS does not receive a keepalive in the expected time, it reverts the shaping rate changes it made in response to ANCP. You can adjust how long CoS waits for a keepalive message by including the maximum-helper-restart-time statement at the [edit protocols ancp] hierarchy level. The interval between keepalive messages is automatically set to one-third the value of the maximum helper restart time. For example, if you set the maximum helper restart time to 120 seconds, then ANCP sends keepalive messages every 40 seconds. In this example, if CoS does not receive a keepalive message within 120 seconds, then it reverts the ANCP-derived policy changes.

ANCP exchanges adjacency messages with neighbors. If an adjacency message is not received from a neighbor within the expected period, then the neighbor is considered to be down and is disconnected. You can adjust how long ANCP waits for adjacency messages from all neighbors by including the adjacency-timer statement at the [edit protocols ancp] hierarchy level. The interval between adjacency messages is automatically set to one-third the value of the adjacency timer.

ANCP can monitor and shape traffic only for access nodes that are configured as ANCP neighbors. Neighbors can establish TCP connections with the NAS. You can configure an access node as an ANCP neighbor by including the neighbor statement at the [edit protocols ancp] hierarchy level.

You can also configure parameters for a specific neighbor to override global or default configurations by including any of the following statements at the [edit protocols ancp neighbor *ip-address*] hierarchy level:

- adjacency-timer—Adjust the interval between adjacency messages exchanged with this neighbor.
- ietf-mode—Prevent ANCP from operating in a backwards-compatible mode for this neighbor; for neighbors that use the current IETF implementation of ANCP.

- maximum-discovery-table-entries—Specify how many discovery table entries are accepted from this neighbor.
- pre-ietf-mode—Enable ANCP to operate in a backwards-compatible mode for this neighbor; for neighbors that use the original IET implementation of ANCP rather than the current implementation.

You can monitor ANCP events and operations by including the traceoptions statement at the [edit protocols ancp] hierarchy level.

Related Topics

- Configuring ANCP
- [edit protocols ancp] Hierarchy Level