Agilent N2X

ANCP Protocol Emulation Software

N5595A

Technical Data Sheet

The most comprehensive tool for realistically emulating thousands of access nodes, allowing users to easily test the ANCP scalability and performance of today's most advanced service-aware edge devices.

Agilent Technologies

Key Features

- **High scale testing – emulation of thousands of ANCP access nodes per test port**
- **Support for Topology Discovery and Line Configuration use cases**
- **Integration with N2X's access protocols for realistic subscriber simulation**
- **Supported on existing N2X Ethernet cards, including 10GbE**

Product Overview

Service providers face the challenge of managing increasing numbers of subscribers and services. Access Node Control Protocol (ANCP. Also known as L2CP or just L2C) is a mechanism designed to facilitate the tasks of subscriber port discovery and configuration. It operates between a service oriented network access server (e.g., BNG, B-RAS) and an access node (e.g., DSLAM) in order to convey subscriber line information and policies. In order to ensure ANCP-enabled BNGs can provide good quality service that meets subscriber expectations, they must be tested under high control and data plane stress with thousands of ANCP sessions. Furthermore, this scaling and functional test must be conducted in the presence of triple play traffic and access protocol activity, as would be found in a deployed network, in order to ensure a fully realistic test.

Agilent N2X is the industry's most comprehensive test solution for testing the development and deployment of network services for converging network infrastructures. Service providers, network equipment manufacturers (NEMs), and component manufacturers can verify service attributes of entire networks end-to-end, while also isolating problems down to individual networking devices and subsystems.

Agilent N2X delivers unparalleled test realism to verify the ultimate performance, scalability and resilience of carrier grade services and infrastructure.

The N5595A ANCP Protocol emulation software complements the existing rich suite of protocols tested by N2X by adding the ability to emulate thousands of ANCP-enabled access nodes per test port. This provides the industry's most comprehensive test solution for testing the ANCP implementation on devices such as BNGs, B-RASs, and edge routers.

Features

High scale testing

N2X is the industry's most scalable ANCP test solution. With the ability to scale to thousands of emulated access nodes (i.e., ANCP sessions) per test port, (See figure 1) customers can validate the ANCP scalability and performance of today's most advanced service aware edge devices.

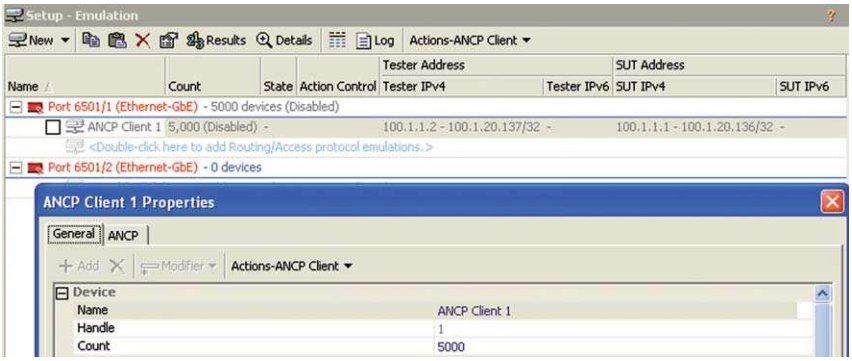

Figure 1: Highly scalable ANCP test solution.

Support for topology discovery and line configuration use cases

The topology discovery functions can be used to signal the activation of new access node subscriber ports, as well as their DSL characteristics, eliminating the need to manually provision each new port on the BNG and allows for real time notification of dynamically changing line properties such as DSL sync rate (See figure 2). N2X fully supports topology discovery and provides flexibility to configure the mandatory TLVs and sub-TLVs specifying line attributes. Subscriber lines and ANCP sessions can be flapped, simulating network outages and generating control plane stress on the device under test (DUT).

ANCP can also be used by the BNG to instruct the access node to apply a particular profile to a subscriber line. As an example, it may be desirable to configure a VoIP subscriber's DSL line for low interleaving delay, as the VoIP service is sensitive to latency. This ANCP use case is known as line configuration. N2X's emulated access nodes provide statistics for line configuration messages received from the DUT, enabling users to quickly diagnose problems.

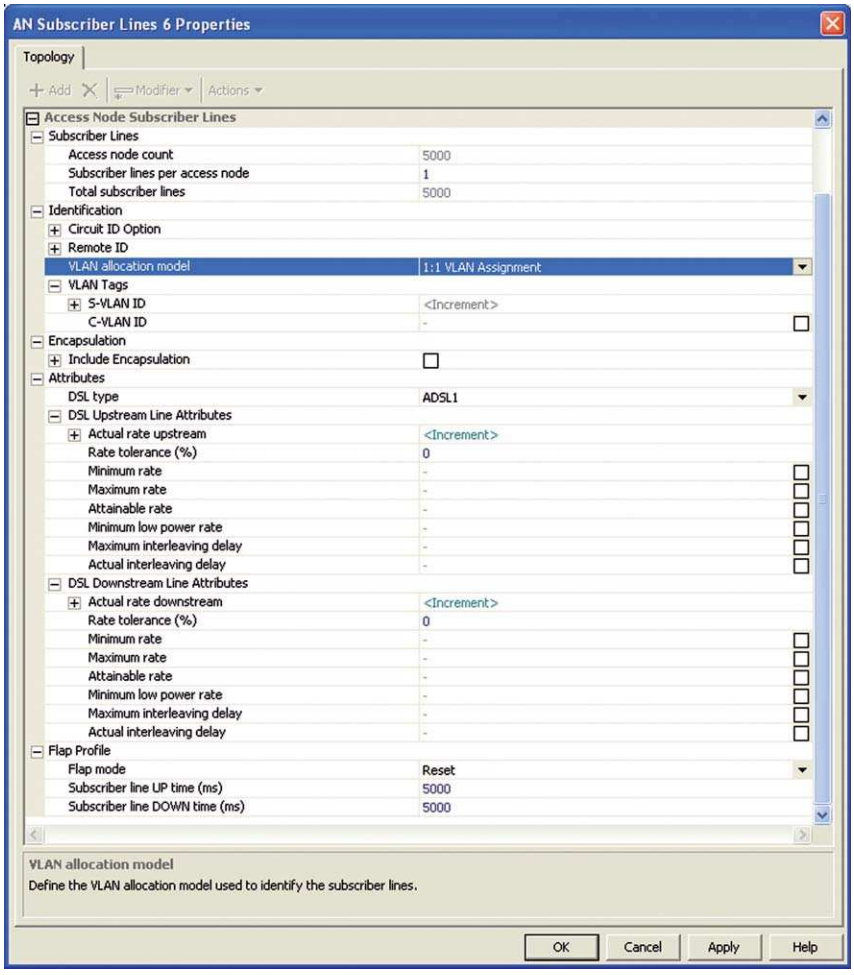

Figure 2: Support for Topology Discovery and Line Configuration Use Case

Integration with N2X access protocol e mulations

It is not sufficient to perform a functional test of ANCP in isolation. ANCP conveys information about subscriber lines and it is therefore appropriate to test ANCP in conjunction with subscriber access protocols such as PPPoE and DHCP. One common test scenario is to use ANCP to signal subscriber downstream bandwidth and then verify that the DUT is throttling traffic to this bandwidth on the corresponding subscriber's PPPoE session, to ensure the local loop is not oversubscribed (See figure 3). On N2X, ANCP sessions can run concurrently with any access protocol on the same test port. Furthermore, a QuickTest wizard binds access protocol and ANCP sessions together, making it easy to configure a test, intern reducing time to insight.

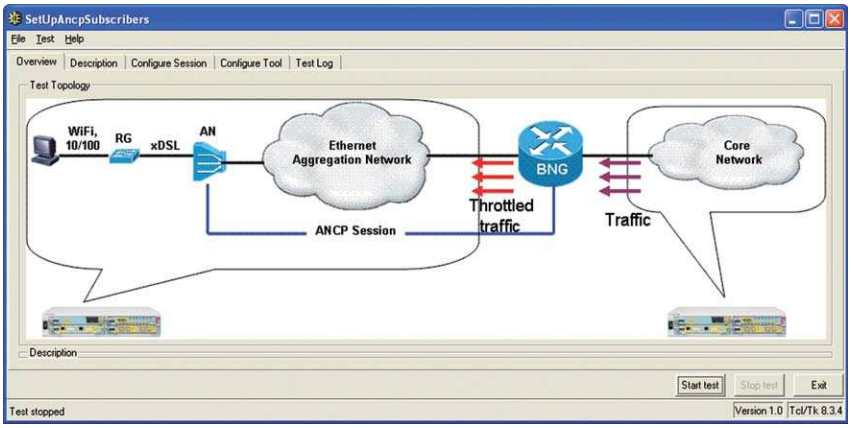

Figure 3: Throttling traffic in response to ANCP signalling.

Technical Specifications

This section contains the protocol-specific parameters that are configurable through the GUI or the TCL scripting environment.

ANCP Client Configurable Parameters

Ethernet subinterface	• Local MAC address • VLAN ID (two VLAN tags may be stacked)
IP interface	• Tester IP address • Gateway IP address • SUT IP address
ANCP Options	• Keepalive timeout (ms) • Capabilities – Topology Discovery (enable/disable) • Topology discovery events per second • Capabilities – Line Configuration (enable/disable) • Subscriber lines per access node • Circuit ID • Remote ID • VLAN allocation model (N:1 or 1:1) • Encapsulation • DSL Type • Actual rate upstream/downstream • Rate tolerance upstream/downstream • Minimum rate upstream/downstream • Maximum rate upstream/downstream • Attainable rate upstream/downstream • Minimum low power rate upstream/downstream • Maximum low power rate upstream/downstream • Actual interleaving delay upstream/downstream • Flap mode (reset/resynchronize) • Subscriber line up time • Subscriber line down time

ANCP Statistics

General Statistics	• Packets transmitted and received
Adjacency Packets	• SYN transmitted and received • SYNACK transmitted and received • ACK transmitted and received • RSTACK transmitted and received
Topology Discovery Packets	• Receipts received • Port UP events transmitted • Port DOWN events transmitted
Port Management Packets	• Line configuration packets received • Line configuration responses transmitted
Establishment time	• Minimum • Maximum • Average
Establishment	• Count • Percentage • Rate
Subscriber Lines Bandwidth	• Downstream bandwidth • Upstream bandwidth

Data Plane Statistics

- All standard N2X data plane statistics are supported. Refer to the E7881B datasheet for more details.
- N2X capture supports the decoding of GSMP/ANCP messages.

Applicable Standards

- RFC 3292 General Switch Management Protocol (GSMP) V3
- draft-ietf-gsmp-v3-base-spec-07 GSMPv3 Base Specification
- draft-ietf-ancp-protocol-02.txt Protocol for Access Node Control Mechanism in Broadband Networks
- draft-wadhwa-gsmp-l2control-configuration-02 GSMP Extensions for Access Node Control Mechanism

Configuration

To use the E5595A ANCP emulation software, the following Agilent N2X hardware and software are required.

Hardware

A N2X system is required with:

- System controller
- Chassis
- One or more Ethernet test cards

The E5595A ANCP emulation software is supported on all N2X Ethernet XR, XR-2, XS, and XS-2 interfaces at speeds up to 10 Gb/s.

Software

The following N2X software licenses are a pre-requisite to supporting the ANCP emulation:

- E7881A or E7881B - Packets and Protocols Application Software

Although note required, the following software licenses are complementary to the ANCP test solution:

- E7887A DHCP Protocol Emulation Software License
- E7888A Access Protocol Emulation Software License (PPPoX/L2TP)
- E7829A DHCP, IGMP, PPPoX and L2TP emulation bundle

Support

The E5595A ANCP emulation software license has a Software and Support Agreement (SSA) contract options associated with it

- PS-S12-001 - 1 year contract included with initial purchase
- PS-S12-102 - 1 year contract extended to 2 years
- PS-S12-103 - 1 year contract extended to 3 years

Please ensure that you have a current SSA in order to automatically receive future releases and technical product support.

Online Help

An extensive online help system provides complete descriptions and detailed usage instructions for every component of N2X. Dialog-level, context-sensitive help provides rapid access to the relevant sections of the online help.

Related Products

Agilent Network Tester

The Agilent Network Tester is a highly scalable and flexible solution for performance testing of Layer 4-7 devices. As a companion to N2X, the NetworkTester provides real-world, stateful application layer traffic generation over PPP sessions, enabling developers to verify the end-user experience and performance of applications running over a broadband network. It also supports 802.1x, IPsec and IPsecv6 access protocols.

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Agilent N2X

Agilent's N2X multi-service tester combines leading-edge services with carrier grade infrastructure testing and emulation. The N2X solution set allows network equipment manufacturers and service providers to more comprehensively test new services end-to-end, resulting in higher quality of service and lower network operating costs.

Warranty and Support

Hardware Warranty

All N2X hardware is warranted against defects in materials and workmanship for a period of 1 year from the date of shipment.

Software Warranty

All N2X software is warranted for a period of 90 days. The applications are warranted to execute and install properly from the media provided.
This warranty only covers physical defects in the media, whereby the media is replaced at no charge during the warranty period.

Software Updates

With the purchase of any new system controller, Agilent will provide 1 year of complimentary software updates. At the end of the first year, you can enroll into the Software and Support Agreement (SSA) contract for continuing software product enhancements.

Support

Technical support is available throughout the support life of the product. Support is available to verify that the equipment works properly, to help with product operation, and to provide basic measurement assistance for the use of the specified capabilities, at no extra cost, upon request.

Ordering Information

To order and configure the test system consult your local Agilent field engineer.

Sales, Service and Support

United States:
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Test and Measurement Call Center
P.O. Box 4026
Englewood, CO 80155-4026
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