TestCenter™

DHCP Test Solution

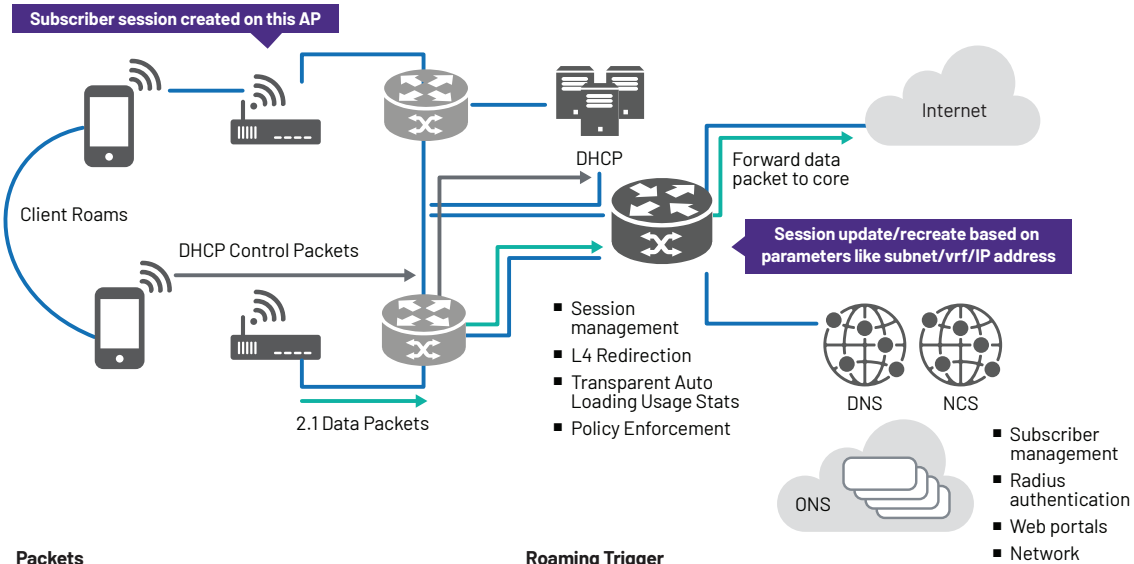
Convergence is creating a new generation of integrated network devices and services that are much more complex than ever before. The resulting increased complexity, scarcity of testing skills and architectural shortcomings in current test systems are hurting the ability of manufacturers to ship products on time at escalating quality levels and slowing service providers' ability to deploy networks that get Quality of Experience (QoE) right the first time.

Advanced DHCP Testing:

- DHCP Test Solution supports DHCPv4, DHCPv6 and DHCP-PD
- Create traffic patterns to test Triple Play
- Set VLAN and QoS settings for subscribers
- Simulate up to 32K subscribers per port
- Powerful command sequencer enables realistic scenarios and session flapping
- Analyze and chart detailed results in real time or export to HTML or PDF
- Create and customize options with the DHCP option editor
- DHCP over L2GRE tunneling using device behind device functionality
- Use DHCP server mode to test access concentrators and relay agents
- Configure DHCPv6 options to support multiple addresses for multiple interfaces in DHCPv6 and DHCP-PD
- Use IP multicast for enhanced realism
- Combine with other TestCenter base packages

The TestCenter DHCP Test Solution enables service providers and network equipment manufacturers to quickly test the scalability and performance of access networks, DHCPv4, DHCPv6 and DHCP-PD servers and relay agents.

Allocation of IP addresses is critical in any network design. The most common method used for issuing IP addresses is through Dynamic Host Configuration Protocol (DHCP). When rolling out next generation access networks and services, many service providers are moving to DHCP for address assignment. Combining authentication and other security measures with DHCP simplifies the provisioning of services like VoIP and IPTV with minimal overhead. To ensure devices like residential gateways, relay agents and DHCP servers are working correctly, network equipment manufacturers and service providers must test their performance and functionality.



Packets	Roaming Trigger
DARP/ARP (if DUT requires ARP replies, TestCenter will retain the IP address)	YES
DHCP init-reroot message to be sent when clients moved from CPE-1 to CPE2 with Option 50 (last known IP address to be retained), if DUT doesn't send ACK, TestCenter will send discovery packet (Refer RFC 2131)	YES

Service providers now have capability to test subscriber roaming either when subscriber roams to a new Access Point or to a new SSID by sending DHCP-INIT Reboot request command for DHCP client block with Requested IP set to the last previously known or assigned IP address.

VIAVI's DHCP Test Solution helps service providers and network equipment manufacturers validate subscriber scalability with unmatched port density. This integrated component of the TestCenter simplifies large-scale test configurations to identify issues involving equipment selection, setting competitive service level agreements and planning growth with confidence. Service providers use the DHCP Test Solution to determine the correct amount of equipment necessary for meeting their customers' needs—avoiding over- and under-deployment.

Applications

TestCenter customers use the DHCP Test Solution to emulate thousands of clients and servers using different services across multiple ports. The package helps determine QoS per subscriber at different subscriber capacities and to determine capacity at a set QoS bandwidth. It can simulate typical or extreme subscriber traffic load conditions for minutes, hours or days, and evaluate key performance parameters of Ethernet aggregation devices under controlled conditions. For Triple Play testing, this package supports testing of multiple services per subscriber. Multiple interface gateways can now receive multiple addresses by configuring IAID value and IA_NA and IA_PD options in DHPCv6/PD.

Benefits

- **Enhanced realism:** Real world scenarios have devices being issued an IP address via DHCP before upper layer protocols such as IGMP are used
- **Fault analysis**
  - IP duplication: Help determine impact when multiple users have the same IP address
  - Address table management: Help determine the effect when there are no available IP addresses and additional users need to connect
- **Detailed analysis:** Data plane analysis down to the client, server, service and stream. This is essential in quickly identifying and resolving intermittent performance issues that occur in only a small number of subscribers
- **Scalable tests:** Both client and server modes scale to 32k subscribers. Host blocks allow rapid configuration of subscribers with like attributes greatly reducing configuration effort.
- **Reduced test time:** Set up flapping test with clients connecting (acquire) and disconnecting (release) to validate system performance in realistic, unstable environments rather than an environment optimized for pure performance. Many of the device faults, such as memory leaks in control processors and poor login time, will only be visible under dynamic testing conditions.

Key Features

- 32K subscribers per port with up to 12 ports per test module
- Over 4 million subscribers per chassis
- Up to 1024 emulated servers
- Detailed analysis: upstream, downstream and peer-to-peer analysis per subscriber or port
- Interactive feature allows functional and negative testing including connecting and disconnecting groups of subscribers
- DHCP Init-Reboot provides faster binding for roaming subscribers with valid lease
- Support for multiple addresses per device, using IAID value and IA_NA and IA_PD options in DHPCv6/PD
- Integrated protocol counters allow user to track protocol messaging
- Real-time results and charting
- Custom DHCP option editor
- Duplicate and copy/paste feature allows quick setup of many host blocks
- A command sequencer provides integrated control plane connect and disconnect and data plane events, allowing users to view the result of a control plane event graphically in real time
- Integrated capture feature allows user to capture and decode control plane and data plane enabling deep functional troubleshooting

Test Results

The DHCP Test Solution provides both real-time and end-of-test results using spreadsheets and graphical formats. These results can be exported in Adobe PDF file format or HTML for spreadsheet or browser-based analysis and reporting. You can select from several methods for tracking data plane traffic. Tracking options include Session ID, VLAN and QoS value.

Technical Specifications

Client/Server Configurable Options Include

- Bind/Renew rate
- Release rate
- Number subscribers
- VLAN ID
- VLAN priority
- VLAN subscriber count
- Host name with variables
- Option 82—relay agent
  - Local IP
  - Server IP
  - Enable circuit ID
  - Circuit ID

Client Specific Configurable Options

- DHCP Transaction ID
- Option 55—request list
  - Subnet mask (1)
  - Routers (3)
  - Domain name servers (6)
  - Domain name (15)
  - Static routes (33)
  - NetBIOS name servers (44)
  - NetBIOS node type (46)
  - NetBIOS scope (47)
  - IP address lease time (51)
  - Server Identifier (54)
  - Renewal time (58)
  - Rebinding time (59)
- Option 82—relay agent
  - Local IP
  - Server IP
  - Enable circuit ID
  - Circuit ID

Client Specific Configurable Options Cont.

- Enable remote ID
  - Remote ID
  - MAC address
- Per test options
- Suggested lease time
- Message timeout
- Number of retries
- Maximum DHCP message size
- Total Init-Reboot
- Lease Time
- Renewal Time
- Rebinding Time
- Min Allowed Lease Time
- Decline Reserve Time
- Offer Reserve Time
- Server Host Name
- Pool Address Start/Step
- Pool Address Count
- Router List
- Domain List
- Domain Server List
- Relay Agent Address Pools
- Force Renew Token
- Auto Solicit

Flap Events Include

- DHCP abort
- DHCP bind
- DHCP renew
- DHCP release
- DHCP session info

Technical Specifications Cont.

Interactive Actions Include

- Bind
- Renew
- Release
- Start Server
- Stop Server
- Abort

Data Plane Configuration

- Duration: seconds, packet burst, or continuous
- Load Options: % bandwidth of port, frames per second, Mbps, Kbps, bps
- Frame Size: individually set, fixed, random, step, custom step list
- Load: individually set, fixed, random, step, custom step list

RFCS Supported

- RFC 2131 DHCP
- RFC 2132 DHCP Options
- IEEE 802.1(.p/.q) VLAN tagging
- RFC 3315 DHCPv6
- RFC 3363 Representing IPv6 Addresses in the DNS
- RFC 3046 DHCP Relay Agent Options
- RFC 2132 DHCP Options
- RFC 3118 Authentication for DHCP Messages
- RFC 3633 DHCPv6-PD Options

Ordering Information

Product	Part Number
DHCP Base Package	BPK-1077B
DHCPv6 Base Package	BPK-1158
DHCP-PD v6 Base Package	BPK-1301
DHCP Init-Reboot Base Package	BPK-1197
Multihoming Base Package	BPK-1198
Emulation (DHCP PPPOE) over L2GRE Base Package	BPK-1319
DHCPv6 PD Multiple Addresses Base Package	BPK-1320

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