Netrounds Test Agents

Real-world traffic generation for automated active assurance

Netrounds Test Agents actively generate authentic traffic and analyze detailed, real-time measurements across multiple applications, services and interfaces. Test Agent capabilities include measurement of network performance (UDP, TCP, Y.1731, TWAMP), IPTV and OTT video, and Internet (HTTP, Ping, Speedtest), as well as VoIP and SIP telephony, mobile radio, Wi-Fi, and remote packet inspection.

All Test Agents are controlled and updated remotely through Netrounds’ unifying Control Center, which can be hosted by Netrounds or deployed on-premise. The Control Center in turn can be accessed through a web GUI or through a cloud API. See the Control Center datasheet for more information.

External OSS and NFV orchestrators easily automate distributed activation tests and quality monitoring through a feature-rich cloud API to the Control Center, while network operations staff access the user-friendly web interface as a test design environment, as well as for on-demand tests, quality monitoring and real-time visualization.

Netrounds Complete Controller-based Solution

<table>
<thead>
<tr>
<th>Netrounds Test Agent Key Features</th>
<th>Main Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genuinely software-based</td>
<td>Suitable for virtualized, hybrid and legacy networks</td>
</tr>
<tr>
<td>Instant remote Test Agent deployment</td>
<td>No need for field efforts using expensive hardware tools</td>
</tr>
<tr>
<td>Traffic generating capabilities</td>
<td>Activation tests and monitoring from end user perspective</td>
</tr>
<tr>
<td>Versatile features and tools</td>
<td>Complete system for assessing end user related services</td>
</tr>
<tr>
<td>Multitasking capabilities</td>
<td>Maximum utilization of each Test Agent</td>
</tr>
<tr>
<td>Central management</td>
<td>Consistent interface and back end for users and orchestrators</td>
</tr>
<tr>
<td>Programmable through complete cloud API</td>
<td>Leverage abstractions for efficient OSS automation</td>
</tr>
</tbody>
</table>

© 2018 Netrounds. All rights reserved.
Virtual (vTA VNF) and Software Test Agents are packaged as downloadable software which is easily installed by the user, whereas Preinstalled Test Agents are configured by Netrounds on certified x86 hardware of various form factors and capacities. All of these Test Agent types have identical traffic-generating capabilities and differ only in terms of packet performance, which is determined by available CPU resources and interface speeds.

Embedded and PC Test Agents are offered with a reduced footprint (1 MB) for installation on system on chip (SoC), OpenWrt-based network devices and as a PC application under Linux, respectively. They have scaled-back functionality to accommodate footprint requirements.

**Netrounds Test Agent Types**

**Virtual Test Agent (VNF)**
- For use in virtualized environments as VNF
- Runs as VM on any hypervisor
- 287–900 MB image size depending on image type (see table below)

**Embedded Test Agent**
- Software embedded on OpenWrt-based network device (provided by customer)
- Small footprint, about 1 MB

**Software Test Agent**
- Complete appliance with operating system and tools
- Downloadable ISO image for any standard x86 HW
- Available as live USB without installation

**PC Test Agent**
- Software installed on customer-provided standard PC
- Test Agent application for Linux OS
- Small footprint: ~ 1 MB

**Preinstalled Test Agent**
- Software delivered on certified x86 HW
- Plug and play
- Either small portable device or rack-mounted

**Browser Test Agent**
- Software running in browser; all major browsers supported
- HTML5/WebSocket or Adobe Flash

**Netrounds Supported Protocols by OSI Layer**

- **Application Layer**: HTTP, DNS, NTP, SNMP, ITU G.107, G.711
- **Presentation Layer**: SIP, SDP
- **Session Layer**: UDP, TCP, RTP
- **Transport Layer**: IPv4, IPv6, ICMP, IGMP, TWAMP, Y.1731
- **Network Layer**: ARP, VLAN, QinQ, DHCP
- **Link Layer**: 100Base-TX, 1000Base-T, 10GBase-SR/LR; GPRS/EDGE/UMTS/LTE; 802.11g/n/ac

© 2019 Netrounds. All rights reserved.
# Preinstalled Test Agent – Delivered as Plug-and-play Device

<table>
<thead>
<tr>
<th>Hardware</th>
<th>HW Medium</th>
<th>HW Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front and back views</td>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
</tr>
</tbody>
</table>

## Network

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 × 10/100/1000 BASE-T (RJ45)</td>
<td>4 × 10/100/1000 BASE-T (RJ45), optional 2 × 10G SFP+ (10GBase-LR), optional 4 × 10/100/1000 BASE-T (RJ45)</td>
</tr>
</tbody>
</table>

## Mobile network

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPRS/EDGE/UMTS/LTE (requires Mobile license option)</td>
<td>–</td>
</tr>
</tbody>
</table>

## Wi-Fi

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>802.11g/n/ac (requires Wi-Fi license option)</td>
<td>–</td>
</tr>
</tbody>
</table>

## x86 CPU

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 × AMD Bobcat T40E, 1.0 GHz, dual core</td>
<td>1 × Intel Xeon E3, 3.7 GHz, quad-core</td>
</tr>
</tbody>
</table>

## RAM

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 GB</td>
<td>8 GB</td>
</tr>
</tbody>
</table>

## Storage

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 GB SSD</td>
<td>16 GB SSD</td>
</tr>
</tbody>
</table>

## Power supply

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC 12 V adapter incl., 110 V or 230 V</td>
<td>AC input, 110–230 V, cable included</td>
</tr>
</tbody>
</table>

## Power consumption

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 W</td>
<td>200 W (max)</td>
</tr>
</tbody>
</table>

## Connectors

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Ethernet: 3 × RJ-45</td>
<td>Electrical Ethernet: 4 × RJ-45</td>
</tr>
<tr>
<td>Optical Ethernet: –</td>
<td>Optical Ethernet 2 × SFP+ slots (optional)</td>
</tr>
<tr>
<td>USB: 2 × USB 2.0</td>
<td>USB: 2 × USB 2.0</td>
</tr>
<tr>
<td>Display: –</td>
<td>Display: VGA</td>
</tr>
</tbody>
</table>

## Temperature ranges

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating: 0° … 50°C</td>
<td>Operating: 5° … 35°C</td>
</tr>
<tr>
<td>Non-operating: 0° … 50°C</td>
<td>Non-operating: −40° … 60°C</td>
</tr>
</tbody>
</table>

## Size

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 × 157 × 168 mm (1.2” × 6.2” × 6.6”)</td>
<td>43 × 290 × 437 mm (1.7” × 11.4” × 17.2”)</td>
</tr>
</tbody>
</table>

## Weight

<table>
<thead>
<tr>
<th>Plan Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>800 g (1.8 lb)</td>
<td>5 kg (11 lb)</td>
</tr>
</tbody>
</table>

## Sold with license (SaaS only)

For the Netrounds SaaS solution, hardware is bundled with licenses as follows:

- Preinstalled Test Agent
  - Small or Medium
  - Medium options: Wireless (i.e. LTE), Wi-Fi
- Preinstalled Test Agent
  - Medium Plus or Large

**Note:** Preinstalled Test Agents exist only in the Netrounds SaaS solution. The same hardware is sold for on-premise deployments without being bundled with Test Agent software.
# Software Test Agent – Downloadable Software for Standard x86 Hardware

<table>
<thead>
<tr>
<th></th>
<th>HDD</th>
<th>Bootable USB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usage</td>
<td>Permanent installation on physical block storage device (HDD)</td>
<td>Live booting from USB memory stick for temporary transformation of any x86 PC hardware into a Netrounds Test Agent</td>
</tr>
<tr>
<td>Delivery format</td>
<td>Delivered as installation ISO image</td>
<td>Delivered as raw disk image, along with executable Windows binary for assisted transfer to USB memory stick</td>
</tr>
<tr>
<td>RAM requirement</td>
<td>256 MB minimum; 512 MB recommended</td>
<td>None; RAM disk used for temporary storage, and image is booted directly from USB device</td>
</tr>
<tr>
<td>Storage requirement</td>
<td>1 GB</td>
<td>None; RAM disk used for temporary storage, and image is booted directly from USB device</td>
</tr>
<tr>
<td>Recommended NICs</td>
<td>Intel NICs recommended</td>
<td>Same as supported by Linux Debian</td>
</tr>
<tr>
<td>NIC driver support</td>
<td>Same as supported by Linux Debian</td>
<td>Same as supported by Linux Debian</td>
</tr>
</tbody>
</table>

# Virtual Test Agent (vTA VNF) – Downloadable Software for Hypervisor Environments

<table>
<thead>
<tr>
<th></th>
<th>Virtual Test Agent Delivery Format</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RAW/QCOW2</td>
</tr>
<tr>
<td>Type</td>
<td>Preinstalled and bootable appliance</td>
</tr>
<tr>
<td>Delivery format</td>
<td>RAW or QCOW2 disk image</td>
</tr>
<tr>
<td>Orchestration support</td>
<td>OpenStack Heat Orchestration Templates (HOT) using cloud-init</td>
</tr>
<tr>
<td>Hypervisor support</td>
<td>OpenStack/KVM</td>
</tr>
<tr>
<td>Example partner platforms</td>
<td>Cisco, HPE, Nokia</td>
</tr>
<tr>
<td>Download size</td>
<td>512 MB (RAW) 900 MB (QCOW2)</td>
</tr>
<tr>
<td>vCPU requirement</td>
<td>1 vCPU</td>
</tr>
<tr>
<td>RAM &amp; storage requirements</td>
<td>RAM: 256 MB minimum; 512 MB recommended</td>
</tr>
<tr>
<td>SR-IOV,</td>
<td>Not required, but could improve accuracy</td>
</tr>
<tr>
<td>PCI passthrough</td>
<td>Same as supported by Linux Debian</td>
</tr>
</tbody>
</table>
Routers on which the RAW/QCOW2 virtual Test Agent has been verified: Cisco IOS XE and UCS, Adva FSP 150 ProVMi, Juniper NFX250, OneAccess OVP, Telco Systems Cloud Metro 10 and 100

Test Agent Functionality

General Network Support

Transport modes
- Bridged Ethernet
- IEEE 802.1q VLAN
- IPv4 over Ethernet
- IPv6 over Ethernet

Physical link configuration
- Duplex setting (full or half)
- Speed setting (10M–10G)
- MTU size (64–9000 bytes)

MAC addresses
- Per physical port or VLAN
- Factory default
- User-defined

Bridge setup
- Bridge physical ports and/or VLANs
- Multiple bridges (max 4 per Test Agent)
- Assign IP hosts to bridges

VLAN setup
- Per physical port (max 10 per Test Agent)
- Full VLAN range (1–4095)
- Priority Code Point (0–7)

IP host setup
- Multi-host (max 10 per Test Agent)
- One host per physical port or VLAN
- Separate routing tables per host
- DiffServ Code Point (0–63)
- Static addressing (gateway, DNS)
- DHCPv4, DHCPv6, SLAAC
- DHCPv4 vendor class
- Use of IP host for management

DHCPv4 server setup
- DHCPv4 server for other clients
- Per physical port or VLAN
- Network range
- Network prefix length
- Gateway and DNS

Interface status
- Per physical port or VLAN
- Current speed/duplex
- Current MAC and IP address
- TX and RX packets
- TX and RX bytes

Supported Standards by OSI Layer

L1 – Physical Layer (Preinstalled Test Agents)
- IEEE 802.3i: 10Base-T
- IEEE 802.3u/x: 100Base-TX
- IEEE 802.3ab: 1000Base-T
- IEEE 802.3ae: 10GBase-SR/LR
- IEEE 802.3ac: 1522 byte “Q-tag”
- IEEE 802.11g/n/ac Wi-Fi/Wireless LAN
- ETSI/3GPP: GPRS/EDGE/UMTS/LTE

L2 – Link Layer
- RFC 826: Address Resolution Protocol (ARP)
- IEEE 802.1q: VLAN
- IEEE 802.1p: Protocol for Traffic Prioritization
- IEEE 802.1ad: QinQ, VLAN Stacking
- IEEE 802.1ag: Ethernet Loopback
- RFC 2131: Dynamic Host Configuration Protocol, DHCP
- RFC 3046: DHCP Relay Agent Information Option

L3 – Network Layer
- ITU-T Y.1733: OAM Functions and Mechanisms for Ethernet-based Networks
- ITU-T Y.1564: Ethernet Service Activation Test Methodology
- MEF 6.1.1: Layer 2 Control Protocol Handling
- RFC 791: IPv4
- RFC 2460: IPv6
- RFC 792: ICMP
- RFC 3376: Internet Group Management Protocol, Version 3
- RFC 5481: Packet Delay Variation Applicability Statement
- RFC 3393: IP Packet Delay Variation Metric for IP Performance Metrics
RFC 2474: Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers
RFC 2680: One-way Loss Ratio
RFC 2679: Minimum One-way Delay
RFC 6703: Mean One-way Delay (section 5.2)
RFC 5357: A Two-Way Active Measurement Protocol (TWAMP) – Full and Light

L4 – Transport Layer
RFC 736: User Datagram Protocol (UDP)
RFC 793: Transmission Control Protocol (TCP)
RFC 3550: RTP: A Transport Protocol for Real-Time Applications

L5 – Session Layer
RFC 3261: SIP: Session Initiation Protocol
RFC 3551: RTP Profile for Audio and Video Conferences with Minimal Control
RFC 3266: SDP: Session Description Protocol
RFC 3264: An Offer/Answer Model with the Session Description Protocol (SDP)
RFC 3515: The Session Initiation Protocol (SIP) Refer Method
RFC 3891: The Session Initiation Protocol (SIP) “Replaces” Header

Internet Performance Measurement

General
Request/response-based
One-armed (single Test Agent)
Distributed (multiple Test Agents)

HTTP
HTTP server (URL target)
Time between requests
Response code validation
Response content validation
Time to first byte received
Page load times
Download rates

DNS
DNS server
Lookup address
Time between requests

Network Performance Measurement

General
Test Agent to Test Agent traffic generation
Point-to-point
Hub and spoke
Custom mesh topologies

DNS record type response validation (A, AAAA, CNAME, MX)
Response time measurement

ICMP (Ping)
IP hosts (targets)
Time between requests
Payload size (64–9000 bytes)
DSCP prioritization
Time-to-live
Hop-by-hop detection of IP hosts

Speedtests
Test Agent as speedtest responder
Tests initiated from browsers
Test duration
TCP port
Number of concurrent TCP sessions
Access control through IP filters

Destination port (UDP and TCP)
Unidirectional or bidirectional
Configurable rate (Mbit/s)
DSCP and PCP header marking
**UDP**
- Unicast or multicast
- Packet size (64–9000 bytes)

**VoIP-like UDP**
- MOS scoring (1–5)
- 20 concurrent calls per Test Agent
- Codec emulation: G.711, G.723, G.729, GSM-EFR
- Media transport generation, not signaling

**Stateful TCP**
- Number of point-to-point sessions
- Output rate limitation for each direction

**Multi-session TCP**
- Number of point-to-point TCP sessions

**TCP throughput testing**
- RFC 6349: Framework for TCP Throughput Testing

**QoS policy profiling**
- Multi-stream generation in each queue
- Mix of UDP and TCP to measure queue build-up
- Profile generated for each traffic stream

**Y.1731/802.1ag**
- ITU-T Y.1731 Ethernet Loopback, ETH-LB

**IPTV and HTTP Streaming Video**

**General**
- Request/response-based
- Emulate single client (one Test Agent)
- Distributed (multiple Test Agents)
- Inline with traffic (interception)

**IPTV MPEG**
- Joining of multicast channels
- Test Agents and input channels selection
- MPEG transport stream analysis
- MPEG loss (continuity counter)
- PCR and RTP packet jitter
- Table errors (PAT and PMT)
- Missing PID detection

**IPTV MPEG inline**
- Interception of IGMP pass-through
- Stream analysis of MPEG TS

**VoIP and SIP Telephony**

**General**
- Hub and spoke
- Point-to-point
- SIP account inventory

**ITU-T Y.1731 Delay Measurement, ETH-DM**
- Participating MEPs (Maintenance Entity Group End Points) as input list
- MEG level (0–7)
- Unavailable Seconds (UAS) per ITU-T Y.1563
- Packet size (64–9018 bytes)

**TWAMP**
- RFC 5357: Two-way Active Measurement Protocol
- TWAMP Light (RFC 5357 App. I)
- Unavailable Seconds (UAS) per ITU-T Y.1563
- Hardware timestamping

**UDP loopback**
- Reflector device configured to loop back UDP packets in hardware
- Very high throughput achievable

**BWPing**
- Measures bandwidth and response times between Test Agent and router/switch
- Uses ICMP echo request/reply mechanism
- Achieves high data throughput

**IGMP channel zapping time**
- Continuous join and leave cycle
- Selection of channels to cycle
- Join and leave delay measurements

**HTTP video streaming (OTT)**
- Apple HTTP Live Streaming (HLS)
- URL input for source of video
- Detection of buffer underrun
- Loop feature for static videos

**IGMP join/leave test**
- Checks if users can join and receive data on allowed multicast channels (and no others)

**Multicast group limit test**
- Checks that a user can only join a specified maximum number of multicast channels

**SIP signaling**
- Registration and unregistration
- Invite and hangup
- Cycle length
### RTP media stream quality
- MOS scoring (1–5)
- Rate

### Remote Packet Inspection
#### General
- Packets intercepted remotely from TAs
- Standard "tcpdump" filters
- Standard "pcap" files

#### Direct packet capture
- Filtered packets forwarded from individual

### Transparency
#### General
- Packet mangling and network transparency/QoS tests

#### L2 transparency – Ethertypes
- Layer 2 transparency for various Ethertypes and LLC/SNAP protocols

#### L2 transparency – Custom Ethertype
- Checks that specified Ethertype passes through network

#### L2 transparency – VLAN
- Verifies transparency for given VLAN tag, VLAN priority (PCP), and DSCP

#### L2 transparency – Custom VLAN
- Checks that packets with given VLAN tag and priority (PCP) are not modified by network

#### L2 transparency – Ethernet control protocols
- Checks transparency for LACP, EAPoL, MVRP

#### L2 transparency – IP
- Verifies IPv4 header integrity as well as IP

### Security
#### General
- Tests primarily designed for Layer 3 networks
- Focused on: Man-in-the-middle (MITM) attacks; Denial-of-service (DoS) attacks
- Abuse – Tracking of end users
- Test Agent acting as either customer or ISP

#### DHCP starvation
- Checks that a customer can only obtain a limited number of IPv4 addresses

#### Fragmented DHCP packets
- Checks that switch drops fragmented DHCP packets before they reach the control plane

#### Fragmented TCP/UDP headers
- Checks that switch drops IPv4 and IPv6 packets with fragmented TCP or UDP headers

### Management protocol scanning
- Checks that management protocols are unavailable at customer ports

### Router redundancy protocol listening
- Checks that VRRP/CARP, GLBP, and HSRP protocols are unavailable at customer ports

### Routing protocols
- Checks that routing protocols are not available on customer ports

### STP – Spanning Tree Protocol
- Checks that STP is not available on customer ports

### Packet loss
- Packet misorderings
- Voice codec (G.711 A-law, G.711 µ-law, GSM)

### Test Agent to local Wireshark application
- Packet capture through server
- Filtered packets forwarded from group of Test Agents to Netrounds’ Control Center for storage and centralized retrieval

- multicast, checking that IP packets are not dropped

### L2 transparency – IPv6
- Verifies IPv6 header integrity

### L2 transparency – MAC address limit
- Checks that number of MAC addresses is between a given minimum and maximum

### L2 transparency – Multicast
- Verifies that multicast packets are not dropped (STP and MPLS protocols)

### DSCP remapping
- Verifies expected remapping of DSCP values between two points in a network

### Layer 4 destination port DSCP remapping
- Same as preceding but with specific UDP or TCP destination ports indicated

### Path MTU discovery
- Determines path MTU (Maximum Transmission Unit) between two Test Agents
Mobile Radio

**General**
- Use of external USB radio modem for GPRS/WCDMA/LTE
- Measurement and logging of basic mobile radio metrics
- Mode switching capability

**Mobile switcher**
- Lock to specific APN
- Lock to specific radio access technology (GSM, WCDMA, LTE 800, LTE 900, LTE 1800, LTE 2100, LTE 2600)

**Mobile logger**
- Received Signal Strength Indication (RSSI)
- Reference Signal Received Power (RSRP)
- Received Signal Code Power (RSCP)
- Reference Signal Received Quality (RSRQ)
- Per-chip Signal to Noise Ratio (Ec/Io)
- Signal to Interference + Noise Ratio (SINR)

Wi-Fi

**General**
- Use of Wi-Fi NIC for IEEE 802.11g/n/ac
- Measurement and logging of basic Wi-Fi metrics
- Network and access point switching capability

**Wi-Fi switcher**
- Configuration of MAC address, MTU, SSID, BSSID, type of authentication and cipher
- 802.11n (High Throughput): enable/disable; 40 MHz channels: enable/disable; MCS indexes allowed
- 802.11ac (Very High Throughput): enable/disable; MCS indexes allowed;
- maximum number of MIMO spatial streams
- Frequency bands – 2.4 GHz, 5 GHz: enable/disable
- Short Guard Interval (SGI) on/off
- Low Density Parity Check (LDPC) on/off

**Wi-Fi logger**
- Received Signal Strength Indication (RSSI)
- TX bitrate, RX bitrate (theoretical maximum)
- TX and RX MCS indexes used
- Guard interval used
- Number of TX and RX MIMO streams
- TX retries

Netrounds Embedded Test Agent and PC Test Agent Measurement Capabilities

- UDP, unicast or multicast; VoIP-like UDP (packet delay variation and loss; packet delay not obtained)
- Stateful TCP
- IPTV/MPEG

For further details on these measurements, see the preceding section.
### Netrounds Test Agent Hardware Performance

<table>
<thead>
<tr>
<th>Performance indicator</th>
<th>HW Medium</th>
<th>HW Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>UDP, unidirectional</td>
<td>1000 Mbit/s (1500 bytes)</td>
<td>4 Gbit/s (1500 bytes)</td>
</tr>
<tr>
<td>TCP, unidirectional</td>
<td>1000 Mbit/s</td>
<td>10 Gbit/s (using multiple concurrent sessions)</td>
</tr>
<tr>
<td>IPTV MPEG</td>
<td>300 Mbit/s (similar to 75 SD channels at 4 Mbit/s)</td>
<td>3 Gbit/s (similar to 250 SD channels at 4 Mbit/s and 250 HD channels at 8 Mbit/s)</td>
</tr>
<tr>
<td>Packet performance</td>
<td>78,000 packets/second (pps)</td>
<td>390,000 packets/second (pps)</td>
</tr>
<tr>
<td>TWAMP</td>
<td>Limited by license to 100 concurrent streams</td>
<td>Up to 8800 concurrent streams generated (2200 per interface)</td>
</tr>
<tr>
<td>Time accuracy</td>
<td>~ 1 ms assuming stable connection to NTP server</td>
<td>~ 1 ms assuming stable connection to NTP server</td>
</tr>
</tbody>
</table>