Netrounds Test Agents can be installed as a bootable image on a USB memory stick. This makes it possible to boot a regular PC (laptop) from the USB memory stick, temporarily transforming that PC into a powerful measurement device. Such a setup is ideal for short-term activation testing and troubleshooting tasks. In effect, field testers will carry a Test Agent in their keychain.

More generally, the Netrounds solution employing USB Test Agents enables a unified and cohesive way of working and brings many advantages over field test tools traditionally used. Some of these advantages are laid out in the table below.

<table>
<thead>
<tr>
<th>Netrounds USB Test Agents</th>
<th>Traditional, hardware-based field test tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very attractively priced (see also Licensing section) – no hardware cost</td>
<td>Expensive, because built on custom hardware</td>
</tr>
<tr>
<td>Swiss army knife supporting both carrier Ethernet and IP networks and multiple services such as IPTV, SIP, Web, and OTT (see also Selected testing features section)</td>
<td>Multiple tools required to test different types of networks and services</td>
</tr>
<tr>
<td>Always available: Plug a USB stick into any laptop to turn it into a professional test instrument</td>
<td>Hard to make sure the right tool is at hand when visiting a customer site</td>
</tr>
<tr>
<td>The entire Test Agent fleet can be managed from a central location, optionally using a mobile phone or tablet, via a Web GUI which adapts to screen size</td>
<td>Controlled through local GUI only</td>
</tr>
<tr>
<td>Test automation and centralized cloud storage ensure that all tests are consistent and that no results are lost</td>
<td>Test results are stored locally in each tool and must be retrieved manually</td>
</tr>
<tr>
<td>All troubleshooting activities at specific customer sites are stored and available to central customer support staff for reference at any later time</td>
<td>No history of test activities stored; no easy way to enable changes in processes or drive continuous improvements</td>
</tr>
</tbody>
</table>
Key output metrics:

- HTTP: Connect time, time until first byte received, response time (avg/min/max)
- DNS: Response time (avg/min/max), timeouts, unexpected responses/response codes
- IPTV MPEG: MPEG rate, MPEG transport rate, MPEG loss, PCR jitter, RTP jitter/loss/misorders, PAT/PMT/PID errors
- OTT video (HLS): Playback rate, download rate, buffer length, buffer underruns, rebuffering
- SIP/VoIP: Rate, loss, misorders, jitter, voice MOS

Application of Netrounds test features to service life cycle

Service Delivery
- Service chain validation
- Y.1564/MEF activation testing
- L2–L7 service testing
- QoS validation
- RFC 6349 TCP throughput testing

Troubleshooting
- Verification of service issues (HTTP, DNS, IPTV, OTT video, VoIP)
- Tests triggered by SLA violations
- Remote packet capture

Examples of testing configuration

The diagram that follows shows how USB Test Agents can be deployed in an operator’s network in order to test a variety of IPTV, OTT video, and SIP voice (VoIP) metrics; including, IGMP join and leave, playback rate, and SIP voice MOS, as a few examples. USB Test Agents also test and monitor the full range of Netrounds Test Agent Layer 2 to 7 capabilities beyond voice and video. Although placed at the network edge in this example, USB Test Agents may be used anywhere in the network. Strategic placement of Test Agents largely depends on use case and desired test and monitoring metrics. For further information on the full range of Netrounds Test Agents testing and monitoring capabilities, refer to the Test Agents datasheet.

Example field testing PC with Software Test Agent bootable by USB