Authentication Extensions for the Dynamic Host Configuration Protocol

draft-pruss-dhcp-auth-dsl-06

Alan DeKok
aland@freeradius.org
Quick reminder of “DHCP Proxy” to AAA*

Host configuration provided by centralized AAA systems
RADIUS subscriber attributes are mapped to DHCP Options
Driven by the need to protect massive investments in custom AAA systems and back-end infrastructure

* This function is available from a number of NAS vendors today

Relying on option 82 marking may not be sufficient in some cases:
- Migration existing Username/Password systems
- End user controlled retail ISP selection (@domain)
- Subscriber nomadicity
- Line information at the Access Node may not always be reliable
Message Flows with EAP

- DHCP v4 message flow with BNG acting as server
- DHCP v4 message flow with BNG acting as relay
### BNG Acting as DHCPv4 Server

<table>
<thead>
<tr>
<th>CND</th>
<th>CPE</th>
<th>OLT/Switch/DSLAM</th>
<th>BNG (DHCP Server)</th>
<th>AAA server</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHCP Discover (w/ DHCP-authproto EAP)</td>
<td>DHCP Vendor Message (w/ EAP Request Option)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DHCP Vendor Message (w/EAP response option)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DHCP Vendor Message (w/ EAP Request option)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DHCP Vendor message (w/ EAP Response option)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RADIUS Access Request (EAP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>RADIUS Access Accept (EAP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>RADIUS Access Request (EAP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RADIUS Access Accept (EAP)</td>
</tr>
<tr>
<td></td>
<td>DHCP Offer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DHCP Request</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DHCP Ack</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Repeats until SUCCESS or failure**
- DHCP Vendor message (w/ EAP SUCCESS) option
BNG acting as DHCPv4 Relay

- CND
- CPE
- OLT/Switch/DSLAM
- BNG (DHCP Relay)
- AAA server
- DHCP server

**DHCP Discover (w/ DHCP-auth-proto EAP)**

**DHCP Vendor Message (w/ EAP Request Option)**

**DHCP Vendor Message (w/ EAP response option)**

**DHCP Vendor message (w/ EAP Request option)**

**DHCP Vendor message (w/ EAP Response option)**

- Repeats until SUCCESS or failure
- DHCP Vendor message (w/ EAP SUCCESS option)

**DHCP Offer**

**DHCP Request**

**DHCP Ack**

**RADIUS Access Request (EAP)**

**RADIUS Access Accept (EAP)**

**RADIUS Access Request (EAP)**

**RADIUS Access Accept (EAP)**

**DHCP Discover (w/o DHCP auth proto)**
Implementations

• Server and relay – Major network vendor
• Client – Linux / *BSD – low-end AP
Q&A