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General

What is mesh networking?

Mesh networking is used to route data, voice and instructions between nodes (typically routers). A mesh network typically consists of 2 or (many) more nodes, which exchange information about their connection-status with each other (routing updates), so that every node knows, which path he has to take to reach any other node in the mesh. When a node wants to reach another node that is not directly connected, the traffic flows over other nodes, until the final node is reached (hopping) -each node that the traffic flows through is called a hop.

Why mesh networking?

Mesh networks differ from other networks in that the component parts can all connect to each other via multiple hops. Mesh networks are self-healing: the network can still operate even when a node goes down or a connection drops. The result is a very reliable network.

Benefits of mesh networking

- self organizing
- self-healing
- low system maintenance needed
- robust due dynamic route recalculation

Disadvantages of mesh networking

- additional network traffic

The exchange of routing information (routing updates) can produce a lot of traffic-overhead, also every device that takes part of a mesh must have enough cpu/ memory to have an overview of all other routers and how to reach them. (routing table). A full routing table can get very large - as seen in BGP-Routing: a full BGP table needs 2GB of memory (300.000 active routes). There is also a danger of routing-loops that can appear because of weak routing information.

OLSR

General

OLSR is a dynamic linkstate Protocol which collects link data and dynamically calculates the best routes within the network.

Links:

<http://en.wikipedia.org><http://www.dd-wrt.com/wiki/OLSR>
<http://www.olsr.org>

Parameters

General:

- IpVersion
- AllowNoInt

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- Pollrate
- TcRedundancy
- MprCoverage
- LinkQualityFishEye
- LinkQualityWinSize
- LinkQualityDijkstraLimit

per Interface:

- HelloInterval
- HelloValidityTime
- TcInterval
- TcValidityTime
- MidInterval
- MidValidityTime
- HnaInterval
- HnaValidityTime
- LinkQualityMult

HNA4

IcpConnect

Plugins:

olsrd	OLSR (Optimized Link State Routing) daemon
olsrd-mod-dyn-gw-plain	Dynamic internet gateway plain plugin
olsrd-mod-bmf	Basic multicast forwarding plugin, dependece: kmod-tun
olsrd-mod-httpinfo	Small informative web server plugin
olsrd-mod-quagga	Quagga plugin
olsrd-mod-dyn-gw	Dynamic internet gateway plugin
olsrd-mod-txtinfo	Small informative web server plugin
olsrd-mod-nameservice	Lightweight hostname resolver plugin
olsrd-mod-dot-draw	Dot topology information plugin
olsrd-mod-mdns	Multicast DNS plugin
olsrd-mod-watchdog	Watchdog plugin
olsrd-mod-arprefresh	Kernel ARP cache refresh plugin
olsrd-mod-p2pd	Peer to Peer Discovery plugin
olsrd-mod-secure	Message signing plugin to secure routing domain
olsrd-mod-pud	Position update plugin
olsrd-mod-jsoninfo	

Parameters

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olsrd-mod-sgwdynspeed

Select dynamic smart gateway based on gw speed

Sample config file:

```
DebugLevel          0
IpVersion           4
AllowNoInt          yes
Pollrate            0.1
TcRedundancy        2
MprCoverage         7
LinkQualityFishEye  1
LinkQualityWinSize  100
LinkQualityDijkstraLimit 0 7.0
LoadPlugin "olsrd_txtinfo.so.0.1"
{
    PlParam "Accept" "127.0.0.1"
}
Hna4
{
}
IpcConnect
{
    MaxConnections  1
    Host            127.0.0.1
    Net 192.168.1.0 255.255.255.0
}
LinkQualityLevel 2
UseHysteresis no
Interface "eth1"
{
    HelloInterval          5.0
    HelloValidityTime      90.0
    TcInterval             3.0
    TcValidityTime         270.0
    MidInterval            15.0
    MidValidityTime        270.0
    HnaInterval            15.0
    HnaValidityTime        90.0
    LinkQualityMult 10.100.2.5 0.5
}
Interface "vlan1"
{
    HelloInterval          5.0
    HelloValidityTime      90.0
    TcInterval             3.0
    TcValidityTime         270.0
    MidInterval            15.0
    MidValidityTime        270.0
    HnaInterval            15.0
    HnaValidityTime        90.0
    LinkQualityMult 10.100.2.5 0.5
}
```

Setup

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You always can check the OLSRD status on the daemons web gui:

<http://yourip:8080>

- enable your preferred networking mode. OLSR can run on any interface (lan or wifi).

Try the following steps to get OLSR running:

OLSR on WiFi

Under **Wireless -> Basic Settings**

- connect your devices with the preferred WiFi mode (WDS, adhoc, etc)
- set your wlan mode (b,g,mixed...)
- set your SSID
- set your channel

Before you go on test that the link is working, that the devices are connected and can reach each other.

- unbridge the wlan on the wireless page
- set an ip from a different network than the router uses already
- set the network mask (e.g. to **255.255.255.0** for a /24 network)
- set your preferred encryption

setup OLSR

Under **Setup -> Advanced Routing**

- set Operating Mode to OLSR
- keep the basic olsr settings. they are ok for the first tests
- add the correct wlan interface to olsr dependend on your wifi chip vendor and platform (e.g. on atheros wifi based systems its athX, on broadcom its mostly eth0, on ralink its raX)
- keep the interface settings for testing

Enabling NAT routing

In Gateway mode the router performs NAT, while in other modes it doesn't. When you switch the Advanced Routing Operating Mode to OLSR Router, it turns off NAT. Here is how to turn the NAT back on, assuming you followed the instructions on unbridging the wlan. You must change the interfaces according to your system.

Under **Administration -> Commands** paste the script below into Commands and click "Save Firewall" Do this on each device.

```
iptables -t nat -A POSTROUTING -o $(nvram get wan_ifname) -j MASQUERADE
```

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```
iptables -t nat -A POSTROUTING -o $(nvram get wl0_ifname) -s $(nvram get eth1_ipaddr)/$(nvram get  
iptables -t nat -A POSTROUTING -o $(nvram get lan_ifname) -s $(nvram get lan_ipaddr)/$(nvram get
```

External Links

- [OpenWRt WIKI](#)
- [True life stories](#)
- [staros_olsr](#)

--[Sash](#) 22:00, 7 June 2008 (CEST)