

Wicked – A Network Manager

Olaf Kirch

Director SUSE® Linux Enterprise

okir@suse.com



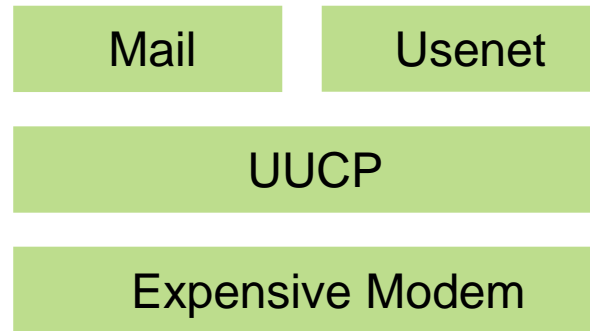
Agenda

- Why Wicked!?
- What we want to achieve
- What Wicked can do today/tomorrow
- Architecture
- Wicked little intro

Why Wicked!?

Why Wicked?

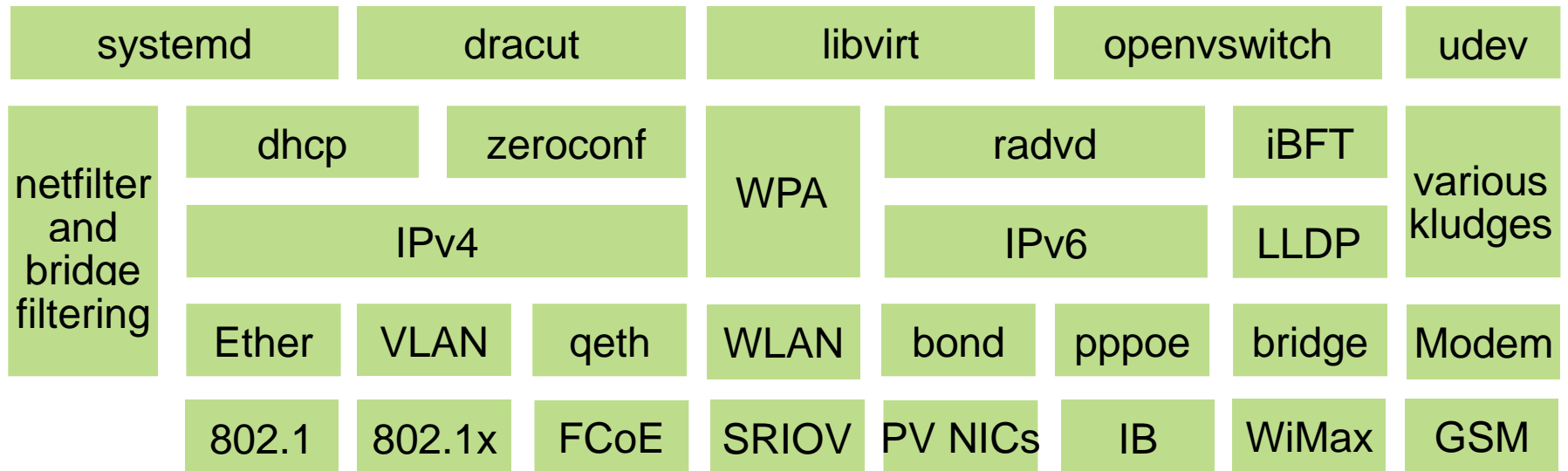
Basically because we went from this...



Why Wicked?

... to something like this.

Converged Networks, Network Virtualization, Storage Networks, ...



How Can I...

... set up a bridge using two bonded NICs as one of its ports?



How Can I...

... set up a bridge using two bonded NICs as one of its ports?

... conveniently check routes, addresses, link-speed... and perhaps hardware offload settings on my Ethernet NIC?



How Can I...

... set up a bridge using two bonded NICs as one of the interfaces?

... conveniently check routes, addresses, link-speed... and perhaps hardware offload settings on my Ethernet NIC?

... reconfigure a bonding device without bringing it down?



How Can I...

... set up a bridge using two bonded NICs as one of the interfaces?

... conveniently check routes, addresses, link-speed... and perhaps hardware offload settings on my Ethernet NIC?

... reconfigure a bonding device without bringing it down?

... configure a wireless connection with WPA2 and DHCP?



How Can I...

... set up a bridge using two bonded

NICs on one side and a single NIC on the other? How do I configure IP addresses, addresses,

... configure a wireless connection with hardware offload WPA2 and DHCP? ... C?

... reconfigure a bonding device without bringing it down?

... disable IPv6 on my DMZ Ethernet Interface?



Today's Networking

- Highly Dynamic
- Virtualized/Software-Defined
- Converged

That Was the Why...Now the What

What We Want To Achieve

- Goal
 - Cope with increasingly complex configurations
- Target Audience
 - Data Center and End Users
- Positioning
 - Network configuration is a service
- Usability
 - Make adoption as smooth as possible

What We Want To Achieve

Technical Attributes

- Architecture-independent
- Extensible
- Needs small footprint (initrd use)
- React flexibly to network changes
- Broadcast event notifications
 - interface comes up, IP address assigned, routing changed

Where Are We?

- Wicked is in SUSE Linux Enterprise 12 GA
 - SUSE Linux Enterprise Server defaults to using wicked
 - SUSE Linux Enterprise Desktop defaults to using NetworkManager

Smooth Transition

- What's Changed?!
 - For end-users – nothing really, so relax :D
 - Lots of manpages on ifcfg-* files
- Wicked supports the same functionality as SUSE Linux Enterprise Server 11
- Invasive, yes – Disruptive, no

Backward Compatibility

- Sysconfig ifcfg-* style configuration
 - In place for backward compatibility
 - Converted to an internal format that is structured, extensible and more powerful
 - “Internal format” to be exposed to administrators/users by future Service Pack
- /sbin/{ifup,ifdown,ifstatus,ifprobe} scripts wrap wicked commands

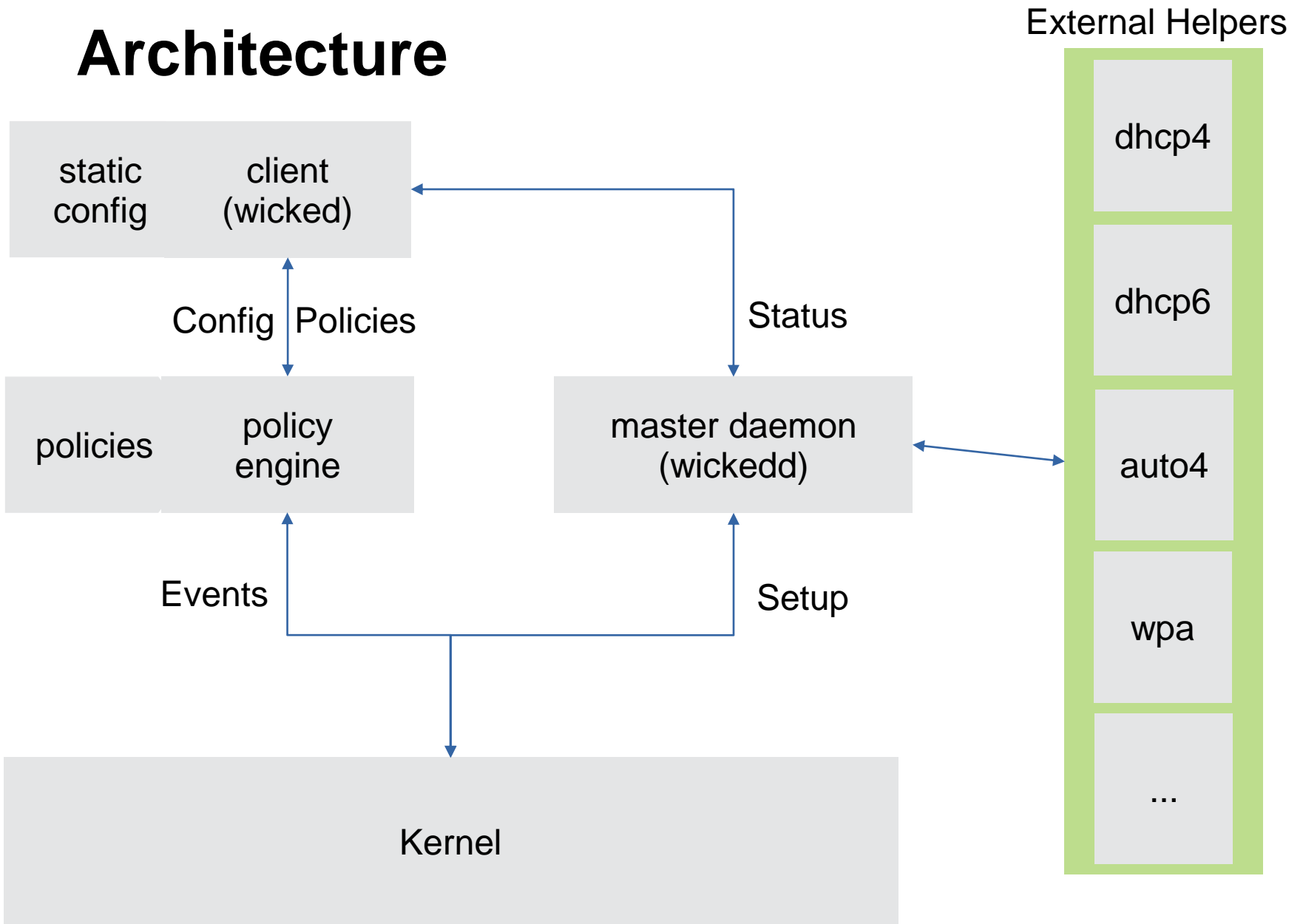
What Wicked Can Do Today

- Device types
 - Ethernet, VLAN, Bridging, Bonding, Infiniband, Loopback
 - tun, tap, ipip, sit, gre, dummy
 - macvlan, macvtap
 - hsi, qeth, iucv
 - wireless (one wpa-psk/eap network)
- Address configuration: static, dhcp4, dhcp6, IPv4 zeroconf
- Hot-plugging

What Wicked Will Do Tomorrow

- In implementation
 - better tunneling (esp. IPv6 tunneling)
- On the roadmap:
 - Documentation improvements
 - pppoe (lower priority), ppp/UMTS [SP1]
- On the radar:
 - Improve integration with openvswitch
 - Network namespace awareness and virtual ethernet support
 - Improve wireless support

Architecture



A Wicked Little Intro

Network Service

- Wicked is a systemd thing!
 - lots of systemd unit files
- network.service
 - Start and stop “The Network”
 - This can be either wicked or NetworkManager
- wicked.service
 - Start and stop the networking the wicked way
- wickedd.service
 - Control all wicked daemons

Network Services (systemd)

- Enable / Disable
 - `systemctl enable wicked.service`
 - enables also `wicked*.service`
 - creates `network.service` alias link
 - `systemctl disable wicked.service`
 - disables all wicked services, but DOES NOT stop them

Wicked and NetworkManager

- Show the network service currently being used:
 - `systemctl show -p Id network.service`
- To switch between the two, disable one, then enable the other:
 - `systemctl stop network.service`
 - `systemctl disable wicked.service`
 - `systemctl enable NetworkManager.service`
 - `systemctl start network.service`
- .. or vice versa

Restarting the Network

- `systemctl restart network.service`
 - restarts the network interface configuration
- `systemctl restart wickedd.service`
 - restarts wickedd daemons without reconfiguring the network interfaces

Debugging Options

- Command line

- `wicked --debug <all | most | help | ...>`
 - Enables debug level and sets filters by wicked facilities, e.g.:
`"all,-events,-socket,-objectmodel,-xpath,-xml,-dbus"`

- Configuration file

- Edit `/etc/sysconfig/network/config`:

```
DEBUG="yes"  
WICKED_DEBUG="all"
```

Diagnosis

- Testing DHCP availability
 - `/usr/lib/wicked/bin/wickedd-dhcp4 --test $IFNAME`
 - `/usr/lib/wicked/bin/wickedd-dhcp6 --test $IFNAME`
- Things to watch out for in IPv6 setups
 - If your router advertises Managed configuration, make sure you have a (working) DHCP6 server running :-)
 - Verify the information distributed via DHCP6
- Collecting logs
 - `journalctl:`
`journalctl -b -o short-iso > wicked.log`

Nifty Things You Can Do

Trying out the XML config file

- Step 1: convert ifcfg files to XML:
 - `cd /etc/wicked/ifconfig`
 - `wicked show-config compat: >all.xml`
- Step 2: move old ifcfg files out of the way:
 - `cd /etc/sysconfig/network; mkdir save`
 - `mv ifcfg-* save`

Things to Try: Disable IPv6

```
<interface>  
  <name>eth0</name>  
  ...  
  <ipv4>  
    <enabled>true</enabled>  
    <arp-verify>true</arp-verify>  
  </ipv4>  
  <ipv6>  
    <enabled>false</enabled>  
  </ipv6>  
  ..  
</interface>
```

Things to Try: Enable IPv4 Routing

```
<interface>  
  <name>eth0</name>  
  ...  
  <ipv4>  
    <enabled>true</enabled>  
    <arp-verify>true</arp-verify>  
    <forwarding>true</forwarding>  
  </ipv4>  
  ..  
</interface>
```

Things to Try: Disable hardware-assisted TCP Segmentation

```
<interface>
  <name>eth0</name>
  ...
  <ethernet>
    <offload>
      <tso>false</tso>
    </offload>
  </ethernet>
  <ipv4>
    <enabled>true</enabled>
    <arp-verify>true</arp-verify>
  </ipv4>
  ..
</interface>
```


Summary

Today's Networking

- Highly Dynamic
- Virtualized/Software-Defined
- Converged

Wicked Network Configuration

- Configuration Tools matching the pace of evolution
- Network Configuration as a Service
- Supporting both Data Centers and End Users

Try it

Now part of SLES 12!

Clone it

<https://github.com/openSUSE/wicked>

Your Questions!?

Q & A



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Corporate Headquarters
Maxfeldstrasse 5
90409 Nuremberg
Germany

+49 911 740 53 0 (Worldwide)
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