Securing Your System:

Security Hardening Techniques for SUSE® Linux Enterprise Server

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Overview

What? and Why?

Architecture Dive: Inspection

Tools

What? and Why?

What Should “Security” Be?

What is Security?

Good software...

...does what you expect it to do, and does it well.

Secure software...

...is good software that does nothing else.

What to Do?

Software contains errors

- Malfunctions
- Crashes
- Downtime
- Security Vulnerabilities

  Data loss and disclosure, identity theft, system abuse, privilege transition

Apply Maintenance Updates

A Closer Look

Administration

- Purpose, responsibilities, mandates, team play

Infrastructure

- Network and network boundaries, services

Security Zones

- Assets and protection, domains, domain transitions

Systems

- Deployment, installation, configuration (hardening), monitoring, maintenance, auditing

A Closer Look

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Purpose, responsibilities, mandates, team play

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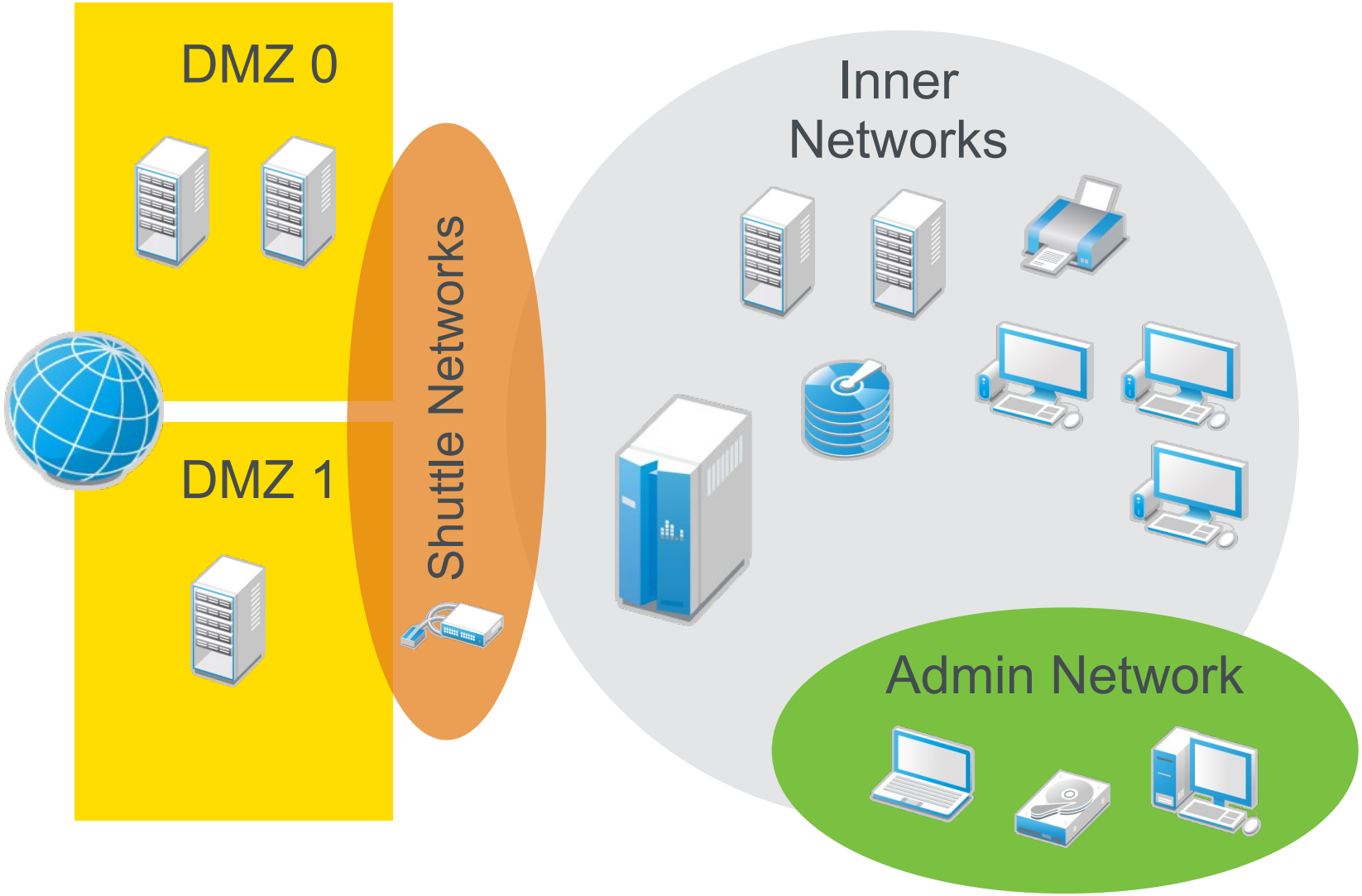
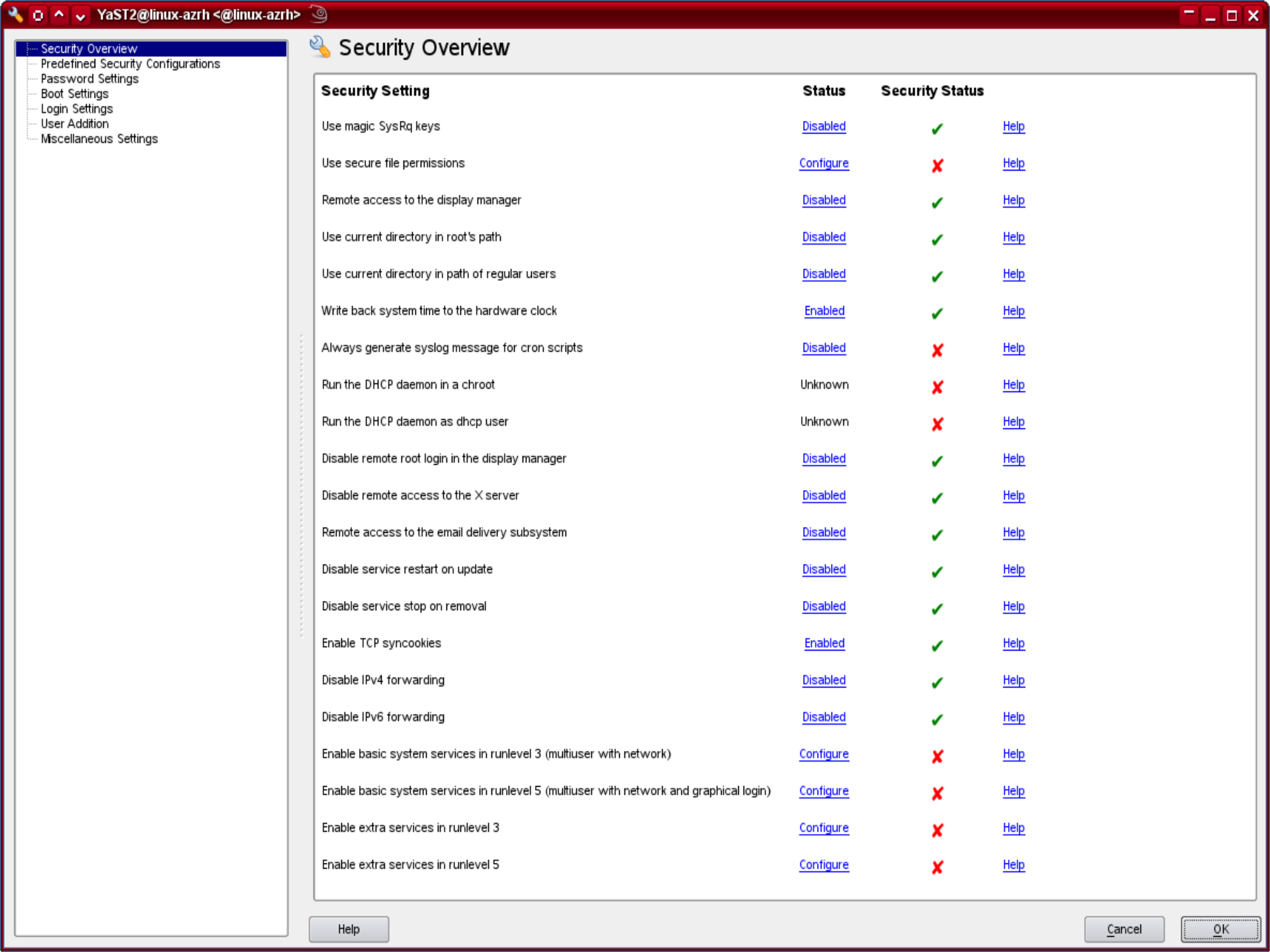
Systems

Deployment, installation, configuration (hardening), monitoring, maintenance, auditing

Inspection, Configuration, Hardening


DMZ 0
DMZ 1
Shuttle Networks
Inner
Networks
Admin Network

YaST Security Center


YaST2@linux-azrh <@linux-azrh>
Security Overview
Predefined Security Configurations
Password Settings
Boot Settings
Login Settings
User Addition
Miscellaneous Settings
Security Overview
Security Setting
Status
Security Status
Use magic SysRq keys
Disabled
Help
Use secure file permissions
Configure
Help
Remote access to the display manager
Disabled
Help
Use current directory in root's path
Disabled
Help
Use current directory in path of regular users
Disabled
Help
Write back system time to the hardware clock
Enabled
Help
Always generate syslog message for cron scripts
Disabled
Help
Run the DHCP daemon in a chroot
Unknown
Help
Run the DHCP daemon as dhcp user
Unknown
Help
Disable remote root login in the display manager
Disabled
Help
Disable remote access to the X server
Disabled
Help
Remote access to the email delivery subsystem
Disabled
Help
Disable service restart on update
Disabled
Help
Disable service stop on removal
Disabled
Help
Enable TCP syncookies
Enabled
Help
Disable IPv4 forwarding
Disabled
Help
Disable IPv6 forwarding
Disabled
Help
Enable basic system services in runlevel 3 (multiuser with network)
Configure
Help
Enable basic system services in runlevel 5 (multiuser with network and graphical login)
Configure
Help
Enable extra services in runlevel 3
Configure
Help
Enable extra services in runlevel 5
Configure
Help
Help
Cancel
OK

What “Local Security” Does in the Background

Run another YaSTmodule

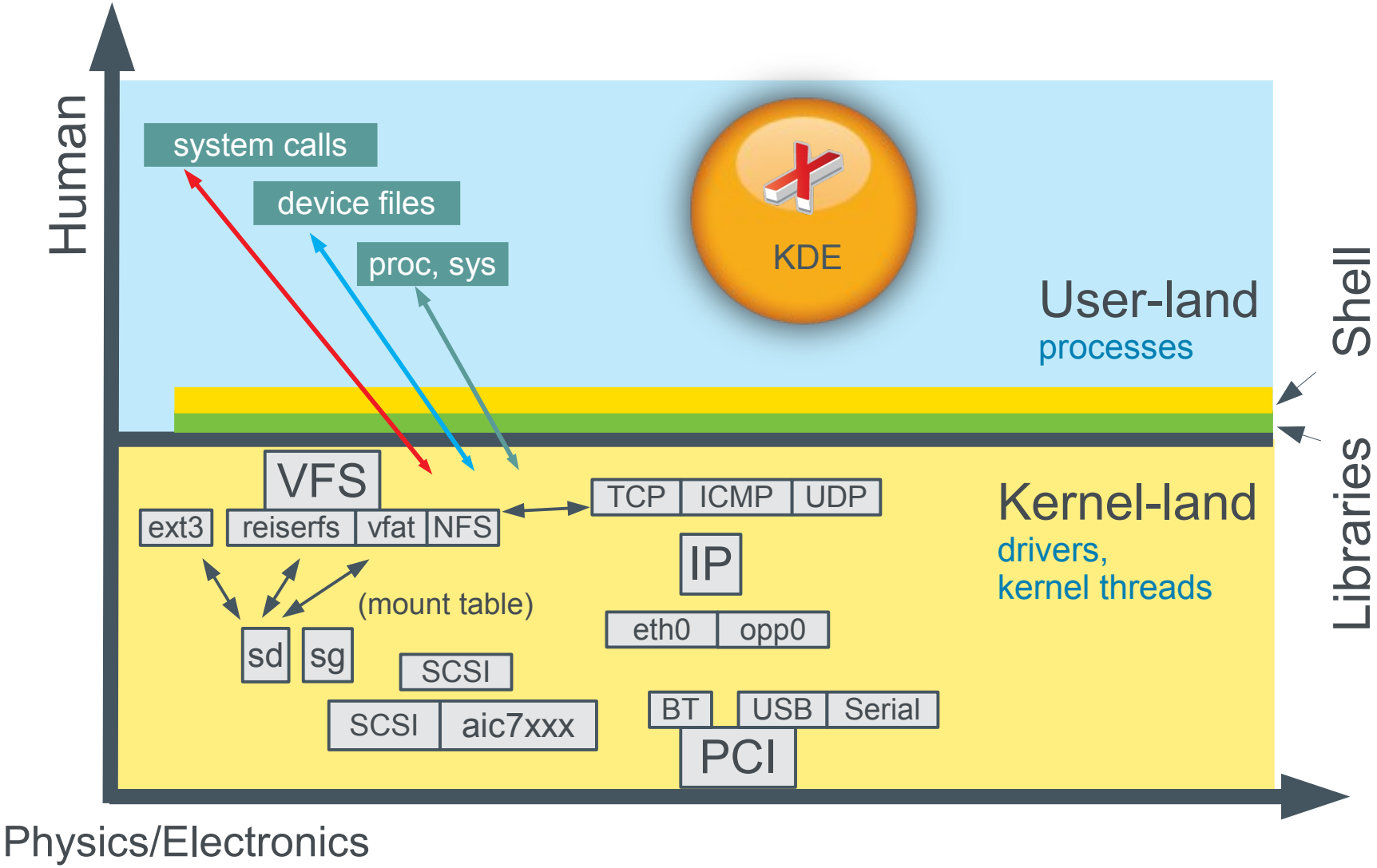
Change settings in files in /etc/sysconfig

Modify configuration files directly

Architecture and Design

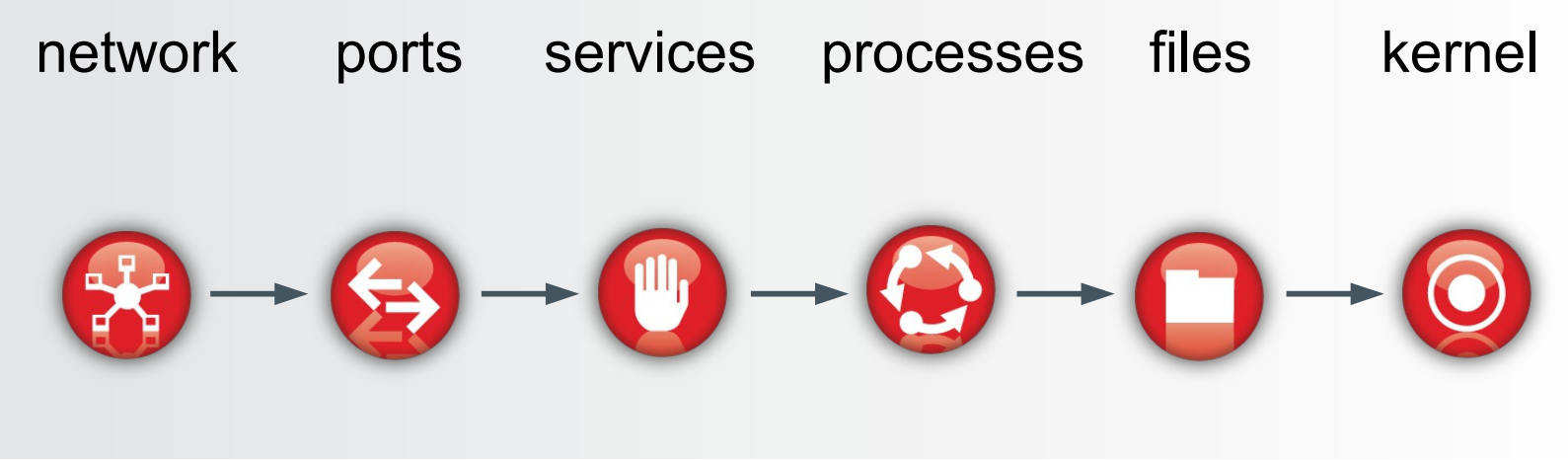
Schematical Overview:

O/S Kernel + Userland



Inspection

Approach your system as if you were an attacker:



Network

Interface addresses: all interfaces enabled and conn.?

Routing setup: IP-forwarding on/off?

Netfilter rules: active, any?

maintain ARP table records

Other tweakables:

txqueuelen, mtu

ICMP replies, ICMP redirects

ECN

slow-start

Ports

port scan: Open TCP and UDP sockets

```
nmap -sS -v -O ip.address.on.network
```

Compare to output of

```
netstat -anpl
```

Discrepancies...?

(Not all services are userland process bound! (knfsd))

Watch out for UDP sockets!

Services

Disable all services that are not needed, permanently

Remove the runlevel symlinks (insserv -r <servicename>)

Kill the servers (rcapache2 stop)

Verify if they the services are really dead!

Remove the packages from the system?

Processes

Get to know all processes on your system in person...

```
ps faux
```

```
rpm -qfi /usr/sbin/nscd
```

...and deactivate whatever is not needed running.

Files

Permissions: /etc/permissions* from /etc/sysconfig/security

Use `chkstat -set <permissions file>` or `SuSEconfig`

```
find / /usr ... -mount -type f \( -perm +2000 -o -perm +4000 \) -ls
```

Integrity measures: AIDE, RPM

maintain offsite RPM database backup for `rpm -Va`

maintain offsite AIDE database backup

Mount options: /etc/fstab, /proc/mounts

Kernel: Use AppArmor!

Example profile: dhcp daemon

```
#include <tunables/global>

/usr/sbin/dhcpd {
  #include <abstractions/base>
  #include <abstractions/nameservice>

  capability dac_override,
  capability net_bind_service,
  capability net_raw,
  capability setgid,
  capability setuid,
  capability sys_chroot,

  /db/dhcpd.leases*      lrw,
  /etc/dhcpd.conf        r,
  /etc/hosts.allow       r,
  /etc/hosts.deny        r,
  /usr/sbin/dhcpd        rmix,
  /var/lib/dhcp/dhcpd.leases*    rwl,
  /var/lib/dhcp/etc/dhcpd.conf   r,
  /var/run/dhcpd.pid     wl,
}
```

Tools

Tools

The YaST Security Center

The YaST AppArmor profile generator

Integrity: AIDE and RPM

Port Scanner: nmap

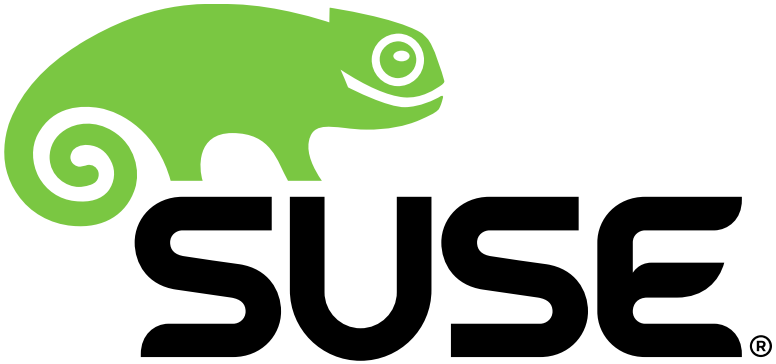
Vulnerability scanner: openSCAP + OVAL

More Tools, More Considerations

System Monitoring: Nagios, Ganglia

Syslog Monitoring: logwatch, Sentinel

Vulnerability scanner: openvas



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