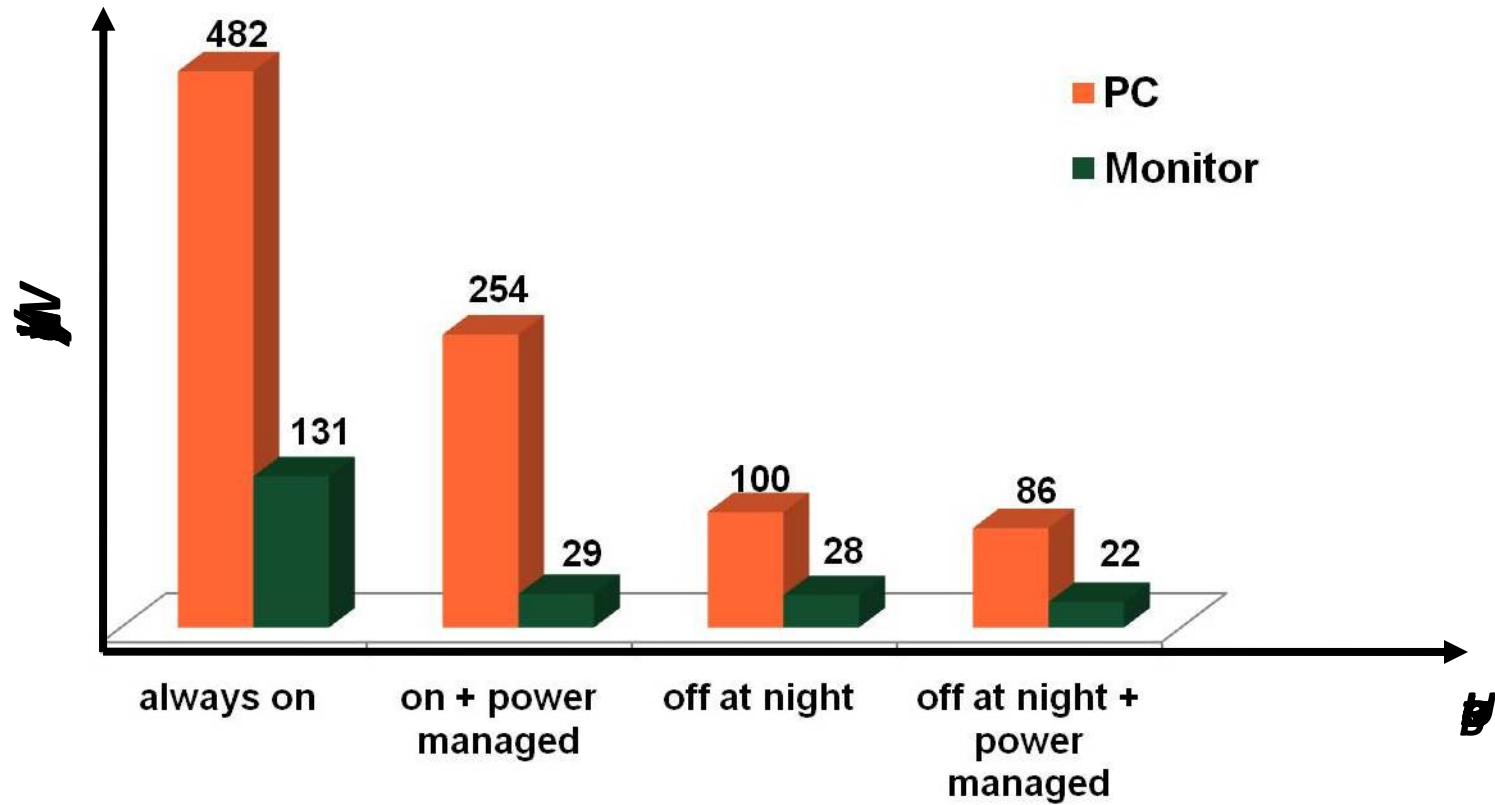**verax**
systems

Green IT Infrastructure Management with Verax NMS

What makes IT consumes so much energy?

How can IT optimize its energy consumption?

Sample savings

Green Steps

⊚ **Power management for unused computers**

⊚ **Use more energy efficient computers first**

⊚ **Optimize load distribution between servers**

⊚ **Replace suboptimal computers**

⊚ **Optimize / replace suboptimal software**

⊚ **Eliminate underutilized network devices**
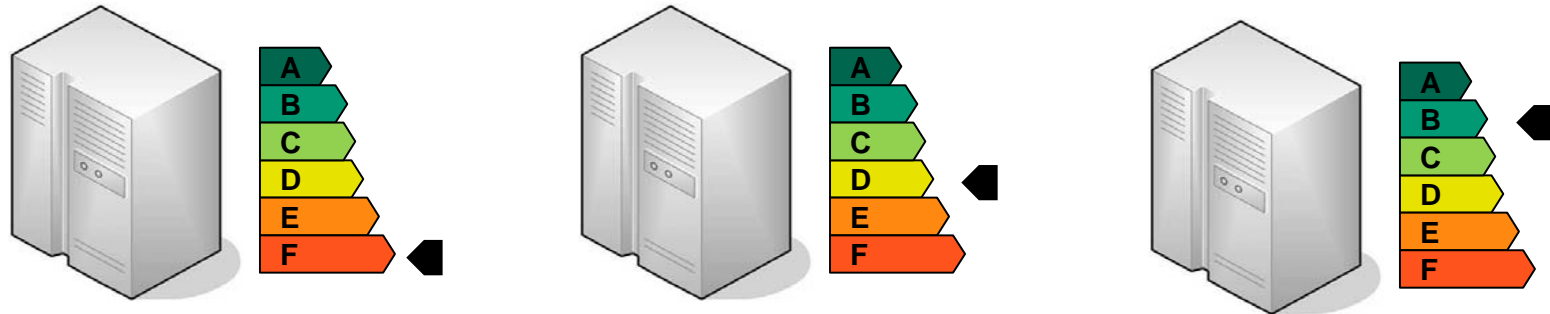
⊚ **React to abnormal energy consumption**

Workstations / monitors:

- **Switch off / hibernate when unused**

- **Standby mode when inactive**

Servers:

Based on current usage, usage record and planned / forecast usage switch active servers on, put ones ready to be used in stand-by and switch all the rest off.

When deciding which sever to activate / deactivate first, use more energy efficient servers first. (Real energy efficiency examined by independent scientific institution.)

Optimize load distribution between servers

Optimize load distribution between servers based on current resource utilization, historical resource utilization and planned / forecast resource utilization taking into account the energy consumption aspects.

Computer replacement simulation
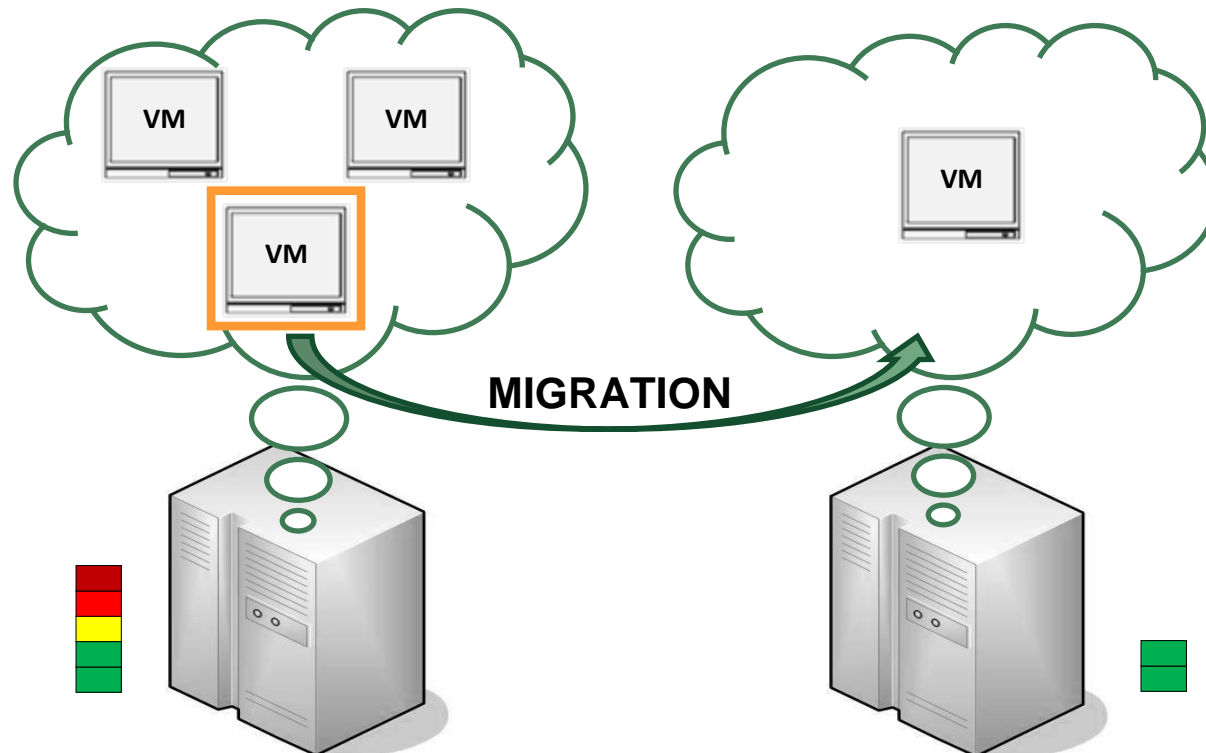
Replace least energy efficient computers if it pays off. Simulation needed to examine the impact on the overall energy consumption. Return on investment calculated based on:

- **real energy efficiency examined by independent scientific institute,**

- **required capacity,**

- **usage record,**

- **planned usage.**

Monitor energy consumption on the software level, identify bottle necks and consider optimizing / replacing least efficient applications.
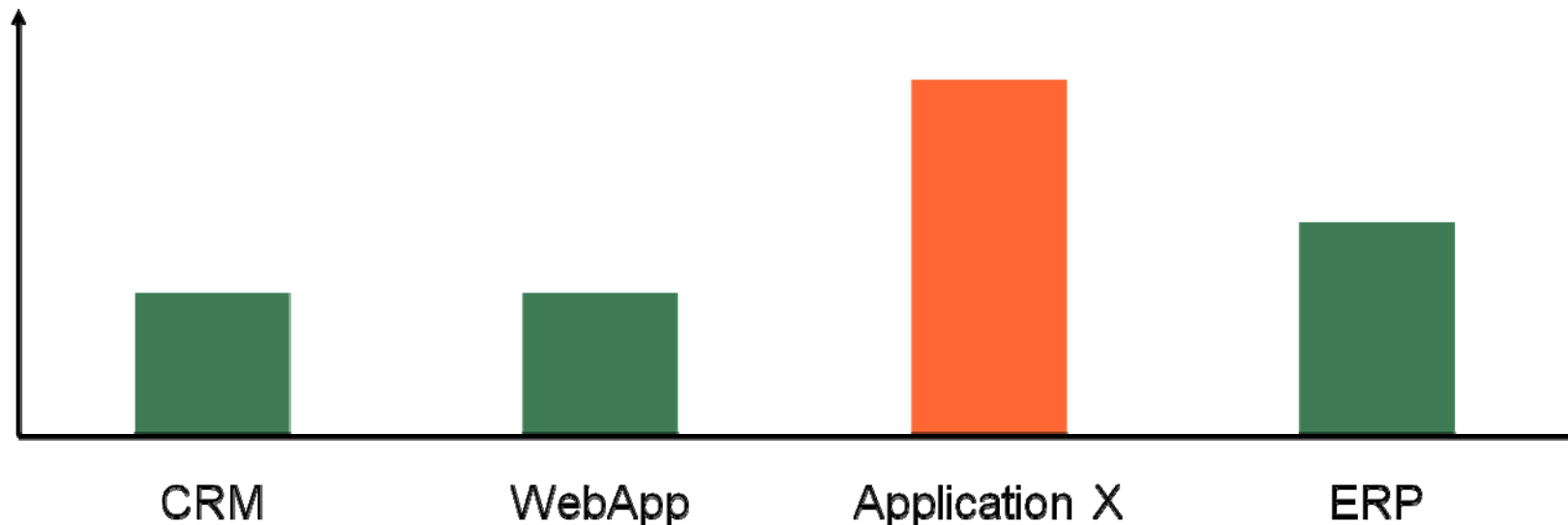
Monitor network devices utilization and the related energy consumption. Identify least efficient devices and consider eliminating them.

Location	Devices	Ports	Used ports	Used ports %	Unused ports	Unused ports %	Total power (kW)	Power per used port (W)
France	11	237	115	48	131	46	3.6	36
Germany	20	623	72	42	531	88	1.1	18.5

Device name	Description	Ports	Unused ports	Unused ports %	Device power (W)	Power per used port (W)
Berlin_Switch_1	ZKO-32	100	50	50.1	400	33.33
Hannover_Switch_3	SWW-123	6	0	0	120	20
…						

Monitor current energy consumption, define rules for alarms in case of abnormal behavior.

Green Process

Monitoring

Decision support

Action

Automation
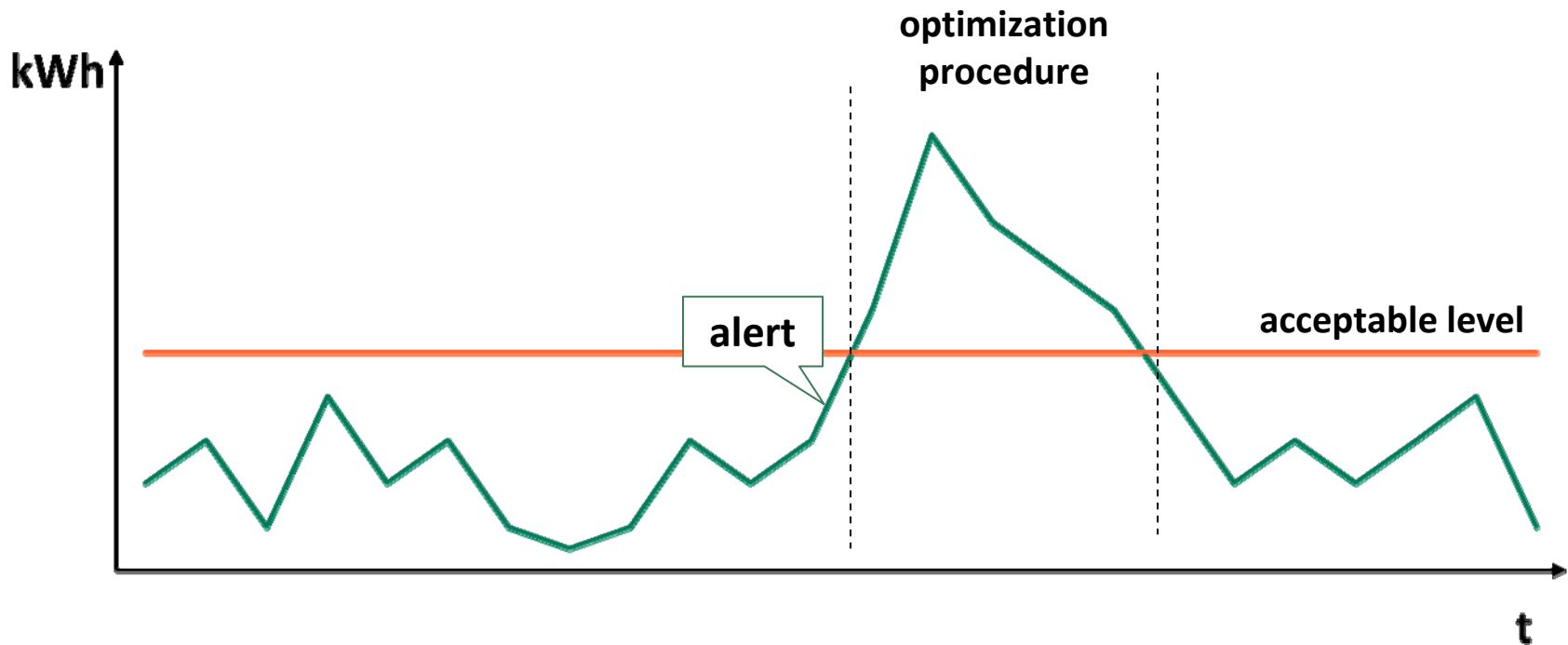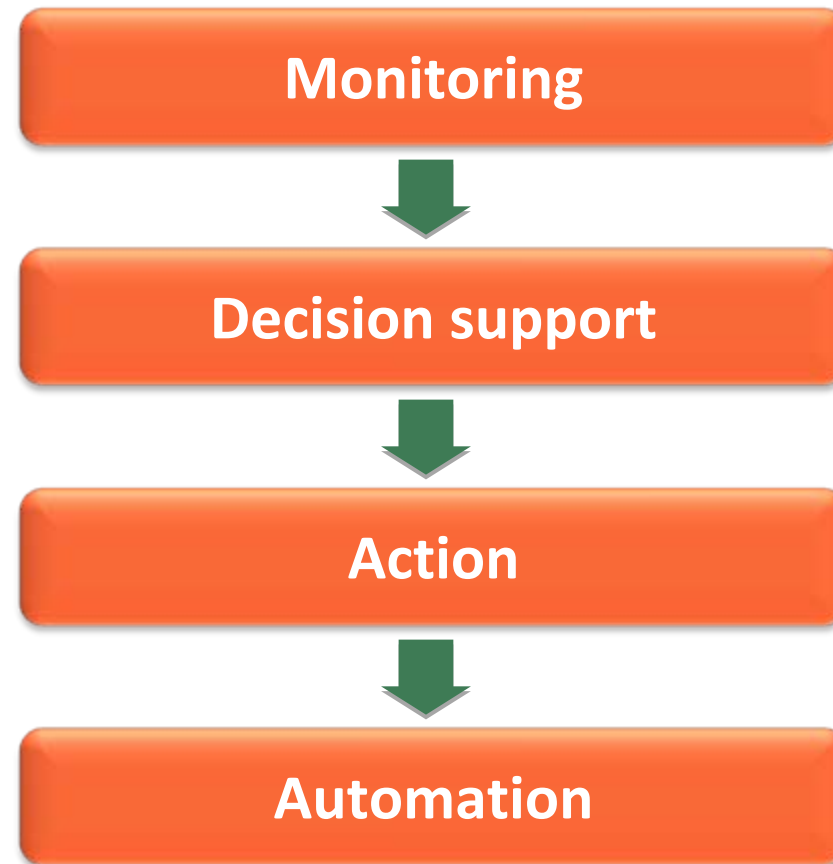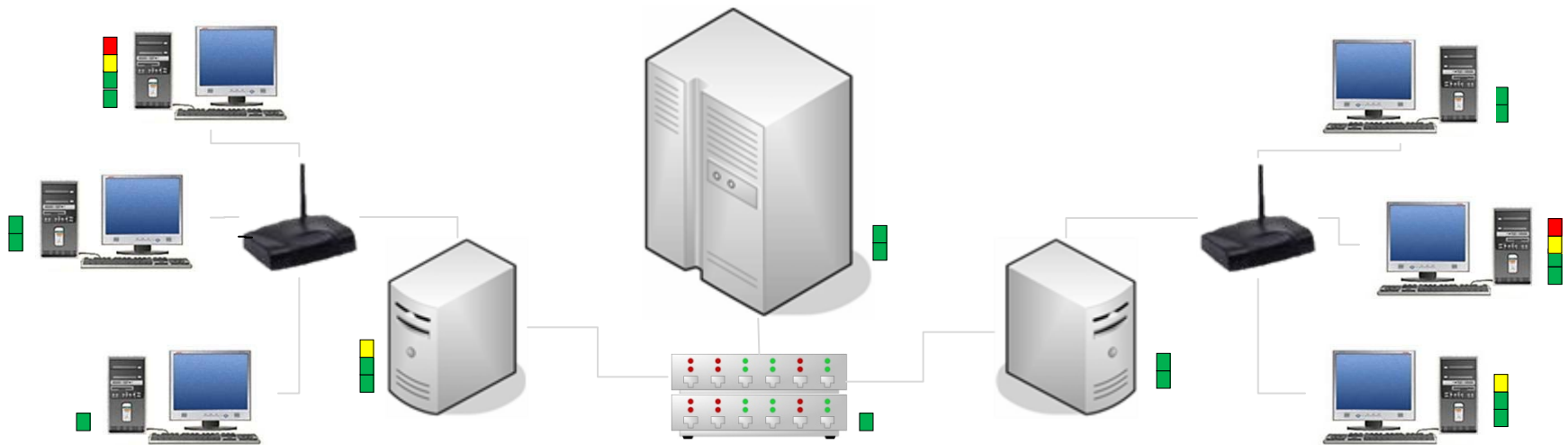
4367,52 kWh

Energy consumption per

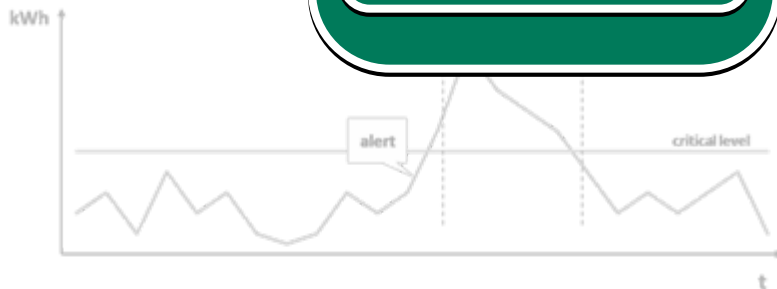- hardware elements (workstations, servers, other devices)
- software applications

historical data
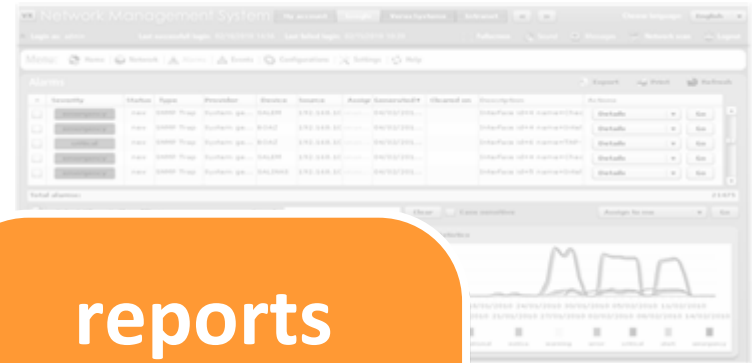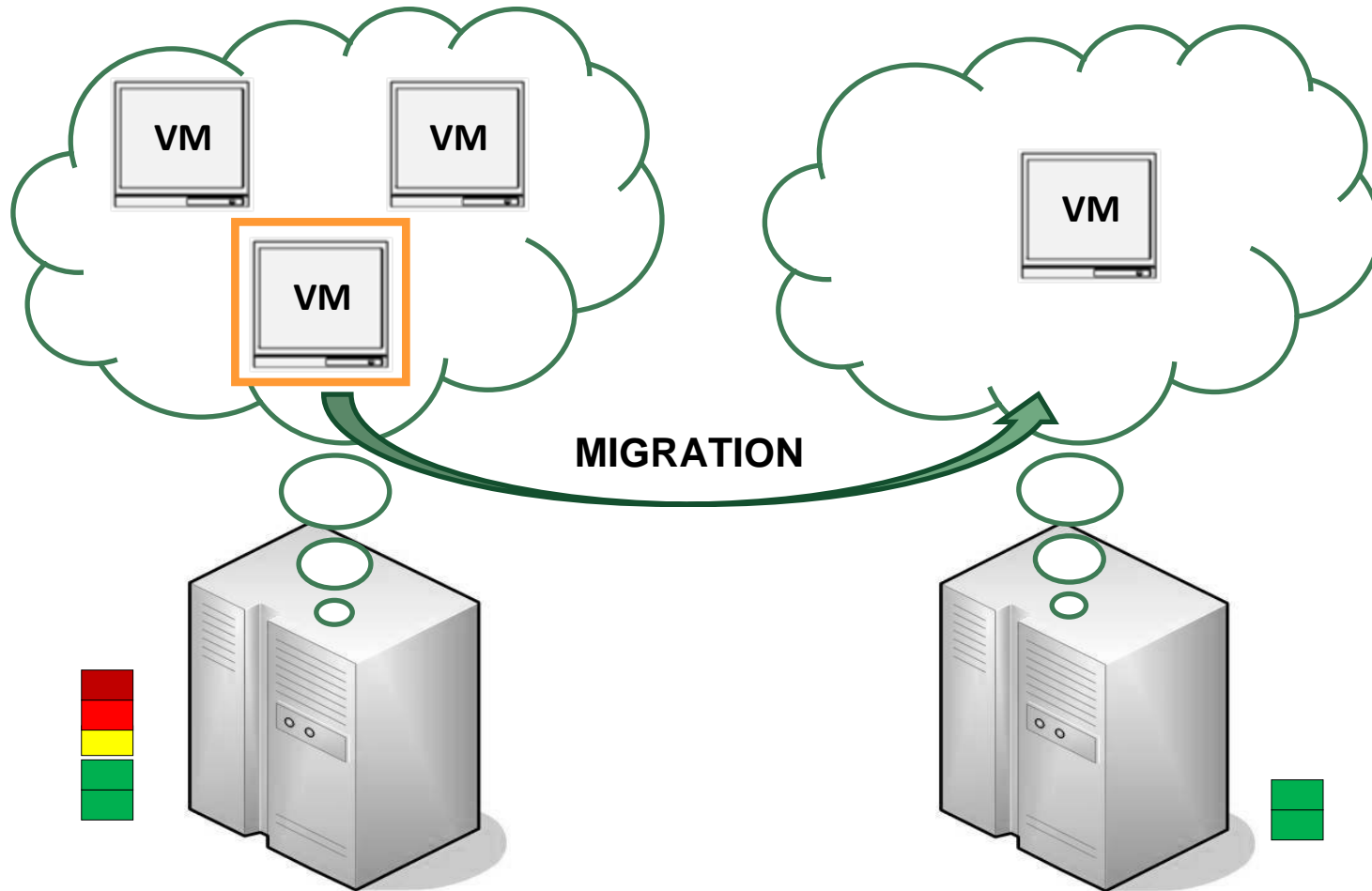
current status
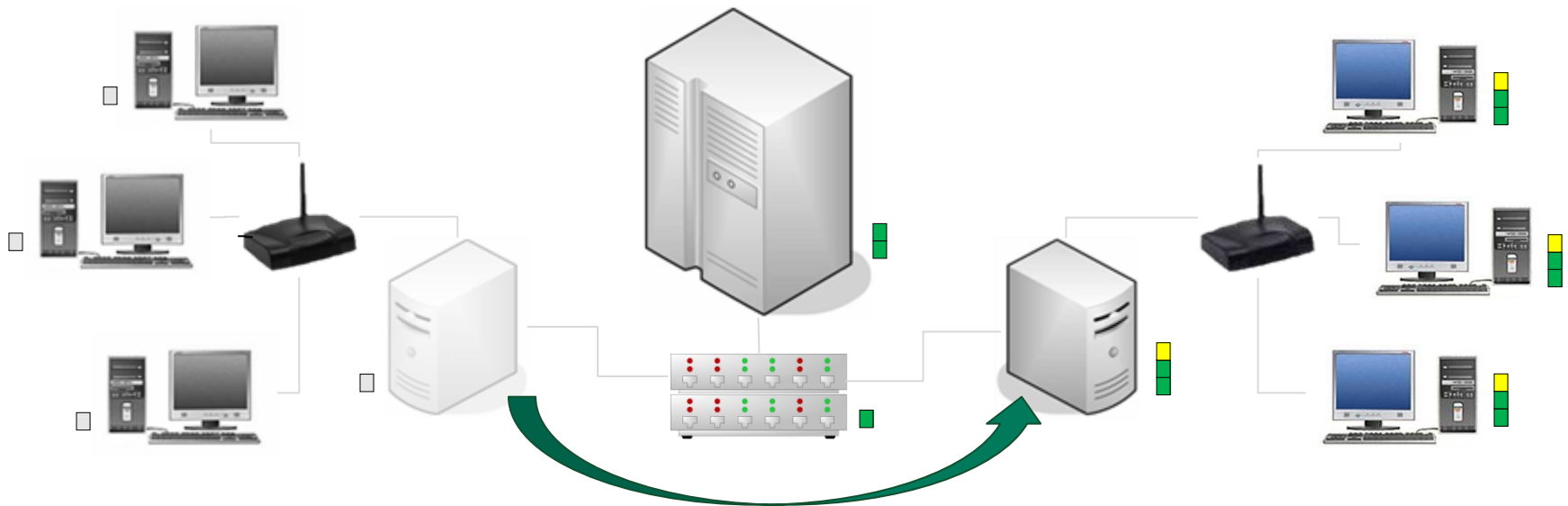
future plans or forecasts

reports charts alarms simulations

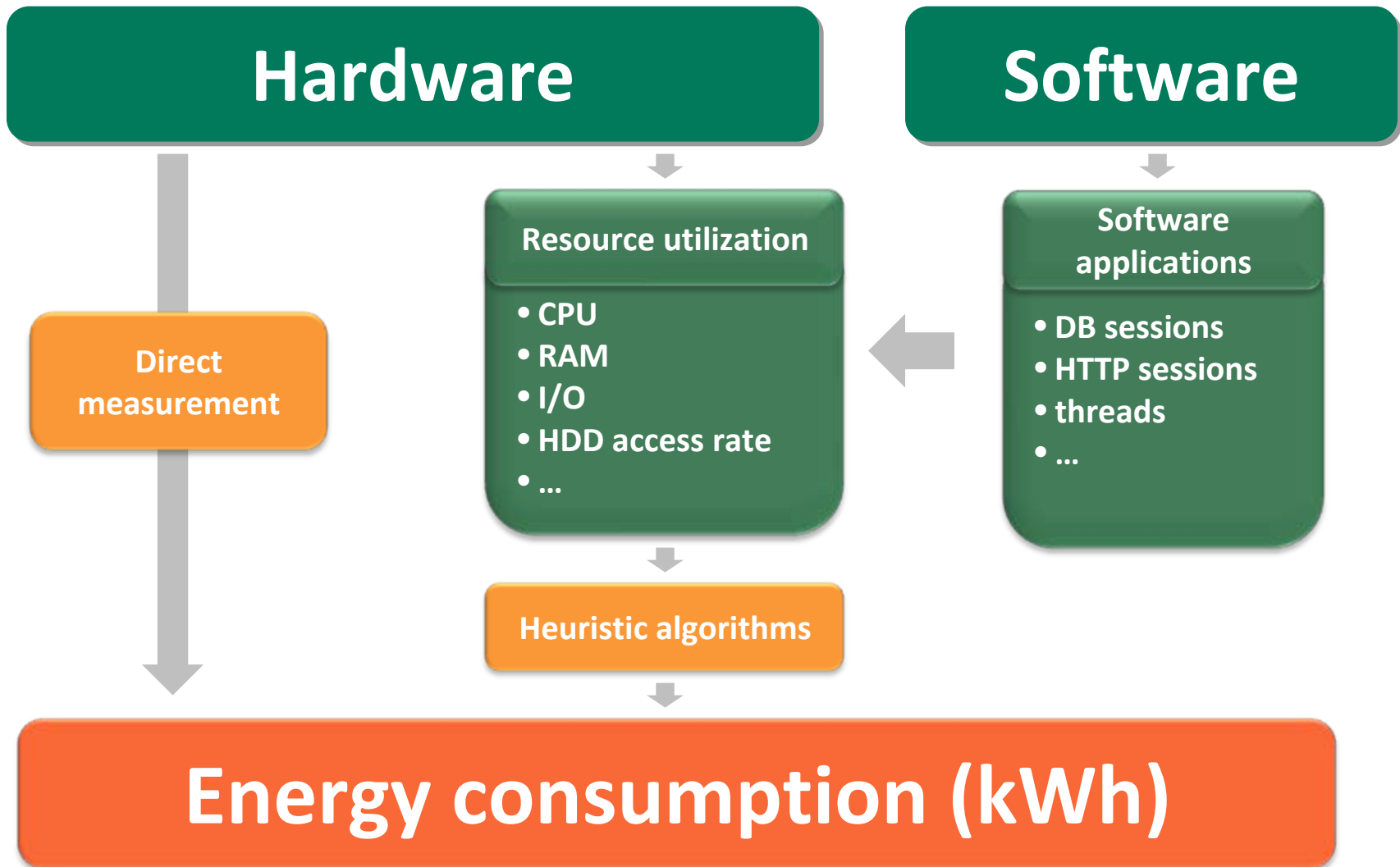**Manage computers and other devices remotely**

Manage hardware and software with automatic rules to reduce human involvement.

Hardware

Software

Direct measurement

Resource utilization

- CPU
- RAM
- I/O
- HDD access rate
- ...

Software applications

- DB sessions
- HTTP sessions
- threads
- ...

Heuristic algorithms

Energy consumption (kWh)

- Holistic approach (hardware & software levels)

- Non-intrusive approach (extra meters not required) - heuristic algorithms where direct measurement impossible

- Advanced multi-criteria decision support system (including complex simulations)

- Remote energy saving actions

- Implementing energy saving policies automatically (human involvement reduced)

Next steps?

Software,

Integration,

Consulting