



# 70-290 Chapter 11 Concept Map

## Hardware Basics

Hardware devices communicate with the system using these resources

Interrupt Request (IRQ) Line

Used to request processor's attention

I/O address

Location in memory where device exchanges information with the OS

Direct Memory Access (DMA) Channel

Permits transfers to & from memory without processor's involvement

Memory address

Used by some hardware devices to store a supplemental BIOS

Hardware resource settings must match OS resource settings

Potential problems

Resource conflicts

Two devices using the same resource

Resource depletion

Running out of available resources

Plug and Play

Allows drivers and devices to autoconfigure

Almost ubiquitous these days

## Driver Installation

Users who do not have this right can install the following types of drivers:

Granted by the "Load and Unload Device Drivers" right

Must be Plug and Play (PnP)

Driver is signed

No Windows interface needed for driver install

Device driver is already present on computer

Bottom line: non-privileged users can load USB/Firewire/Printer device drivers

## Device Manager

Warning symbols

Yellow ! point

Device cannot be started, improperly configured, or has no driver

Yellow ?

Device cannot be identified

Red x

Disabled device

## Device Drivers

Software interface between OS and hardware

Generic drivers usually work for devices like keyboards, floppy, etc...

## Driver Updates

Some drivers are updated by Service Packs and hotfixes

Others updated by device manufacturer

## Driver Signing

Drivers included with the OS are signed by Microsoft

The signature indicates the driver has been tested and not altered

Setting driver signing options on local computer:

Control Panel | System | hardware Tab | Driver Signing

Ignore

Warn

Block

GPO Configuration

User Configuration | Administrative Templates | System | Code Signing for Device Drivers

## Rolling Back Drivers

A way to recover from the installation of a faulty or undesirable device driver

If you can boot the system

Use driver properties tab to Roll Back Driver

If the system is unbootable

Last Known Good Configuration

Safe Mode

Recovery Console (last resort)