# 3.3 Building Models of IoT Systems in Packet Tracer

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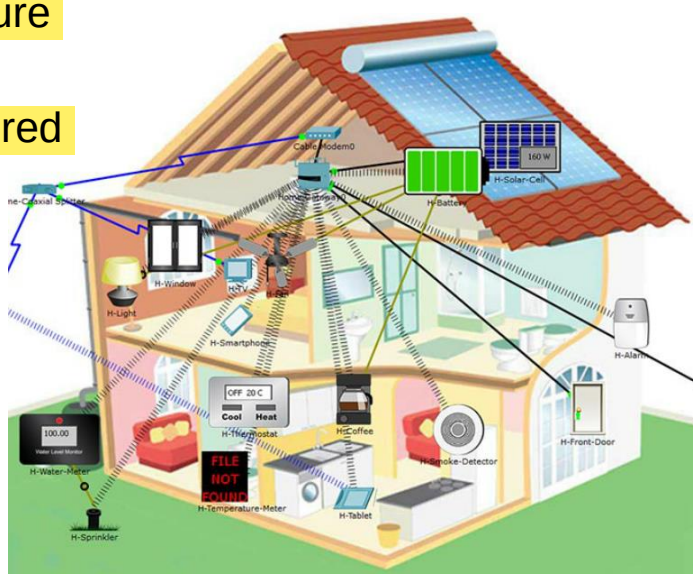
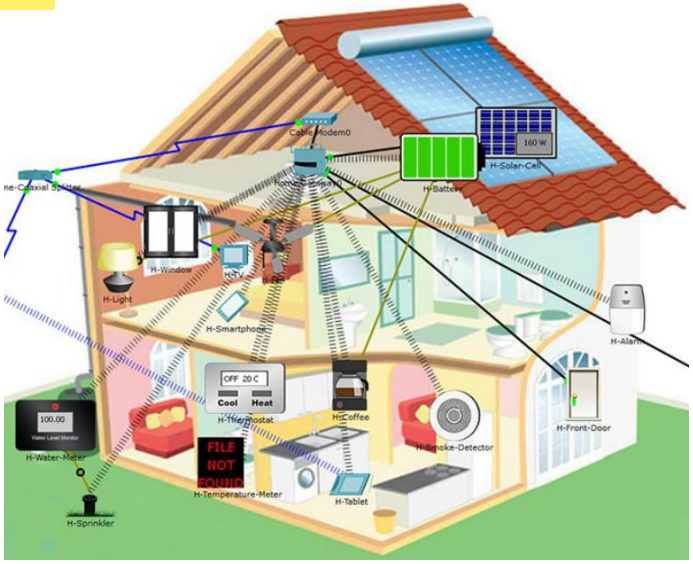
# 3.3.1 A Model of an IoT System

- Introducing The Home Automation Model
  - PT7.0 supports a wide range of IoT devices, such as sensors, actuators, microcontrollers, single board computers, and fog computing devices.
  - PT7.0 allows the design, configuration, programming, and troubleshooting of sophisticated models of IoT systems.
- The Components of the Systems
  - In the Smart Home example, all devices connect to the Home Gateway, which acts as a concentrator for all devices.
  - Sensors monitor the environment while code makes sure values stay within a pre-defined threshold.
  - The code also takes appropriated actions if the monitored values fall out of the pre-defined threshold.
  - The cable modem and splitter pair is what provides Internet connectivity to the Home Gateway and consequently, to the entire home.



# A Model of an IoT System (Cont.)

- The SBC Code in Packet Tracer
  - PT 7.0 also introduces a single board computer (SBC) and a microcontroller unit (MCU).
  - PT SBC simulates an SBC such as a Raspberry Pi.
  - PT SBC provides 2 USB ports and 10 digital I/O ports which can be used to connect IoT sensors and devices.
  - PT SBC has a Python interpreter built in, accessible via PT SBC's Programming tab.
  - PT 7.0 also supports an MCU emulator.
  - PT MCU can be programmed similarly to real-word MCUs.
  - PT MCU has one USB port, six digital I/O ports, and four analog I/O ports.
  - PT MCU can also be programmed with Python.



# 3.4 Chapter Summary

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## Chapter Summary

# Summary

- Programs (also called code) are used in IoT to provide logic and intelligence to the devices. A programmer can create code to allow an IoT device to perform tasks such as monitoring, communicating to others, data processing and more.
- The Raspberry Pi, single board computer, is designed to be small and consume very little power.
- The Cisco PL-App allows access to the Raspberry Pi directly from the network without the need for a monitor, keyboard or mouse to be directly connected to the Pi.
- The Raspberry Pi runs Raspbian, a modified version of the open source and wide-spread Linux operating system.
- The Raspberry Pi supports many different programming languages including Blockly, a visual programming language, designed to help beginners learn how to program. This course focuses on Python, a popular, simple and powerful programming language.
- With added support to Python, Cisco Packet Tracer is a great tool to model, prototype and test entire IoT systems.