

USE 3 (OR MORE) ROUTERS TO PROTECT AGAINST "IoT" INSECURITY

by Francis Chao
fchao2@yahoo.com



Web Location for Presentations:

<http://aztcs.org>

Click on “Meeting Notes”

SUMMARY

- "Internet of Things" (IoT) devices come with a proprietary Internet access methodology that is controlled by their manufacturers. Having IoT devices share the same local network as a computer or tablet is not recommended. We recommend a 3 (or more) router solution for connecting "IoT" devices your home or small business network.

TOPICS

- 3 Router Configuration

BASIC 3 (OR MORE) ROUTER CONCEPT

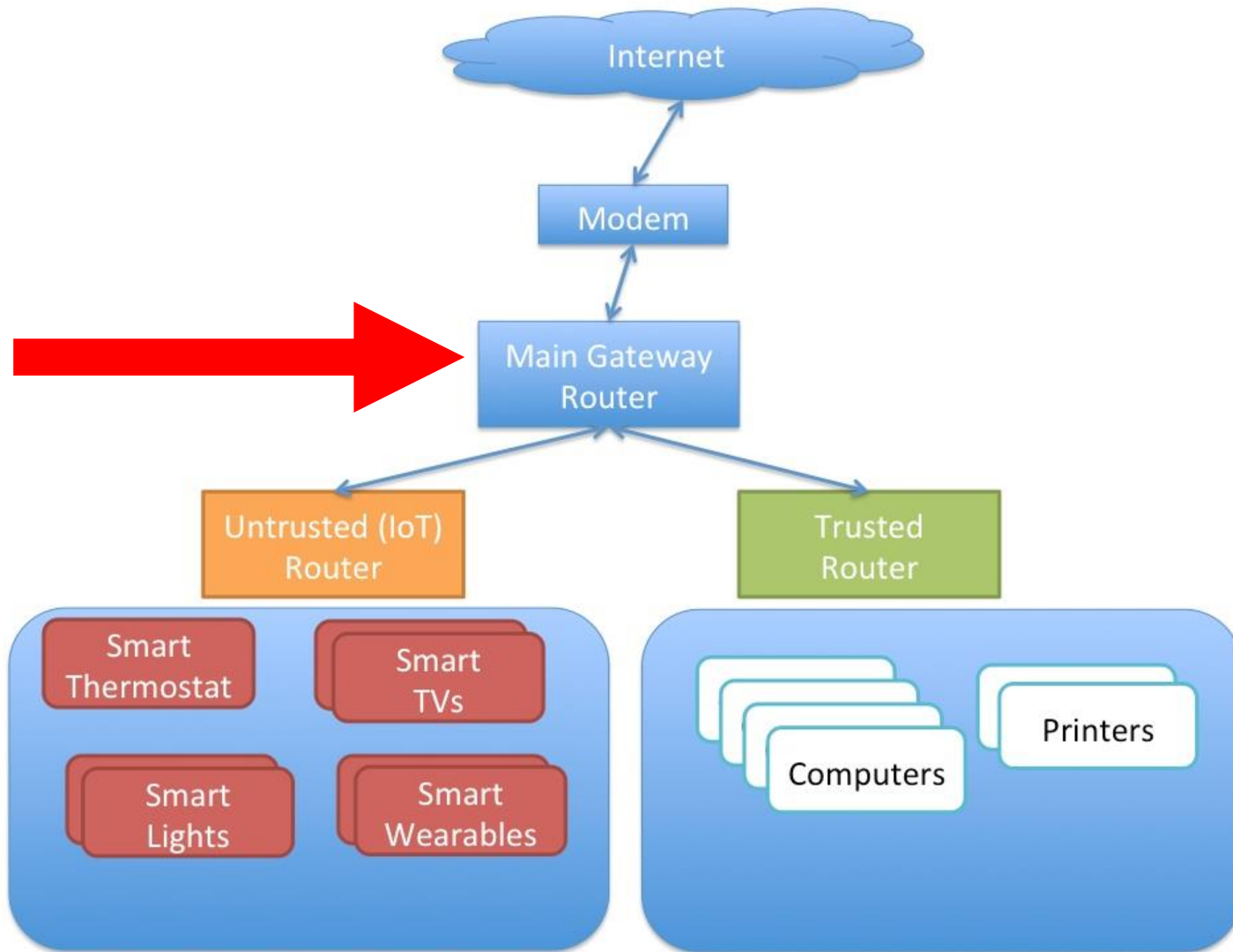
- In the large networks of governments, large businesses, and educational institutions, multiple tree-like levels of routers (both actual and virtual) have been the normal mode of operation for about 30 years

BASIC 3 (OR MORE) ROUTER CONCEPT

- Because of the security risks of using "Internet of Things" (IoT) devices such as Internet-connected home appliances, security cameras, alarm systems, environmental sensors, etc., the multiple router method of protecting computer assets will move into the home and small business.

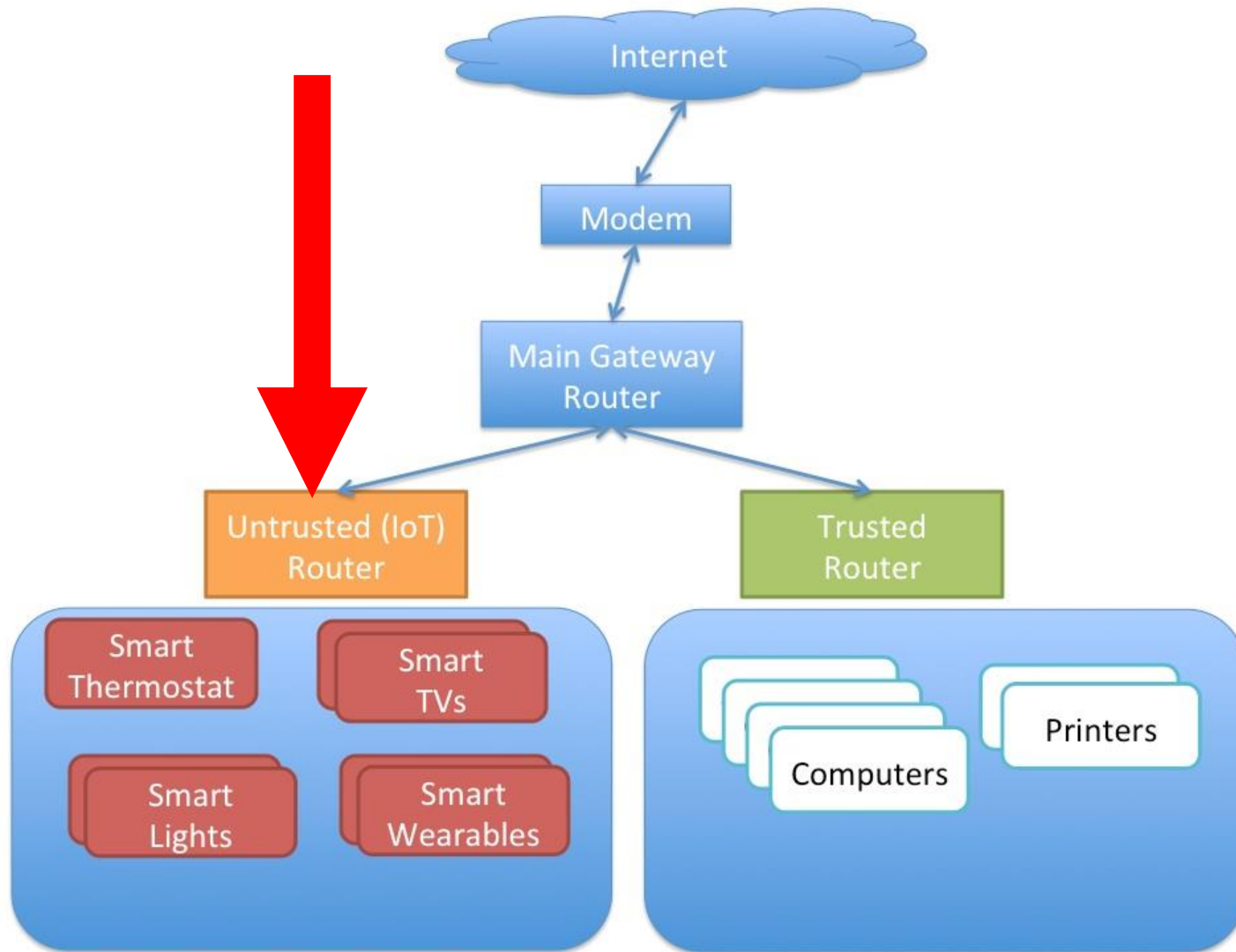
BASIC 3 (OR MORE) ROUTER CONCEPT (continued)

- Main gateway router:



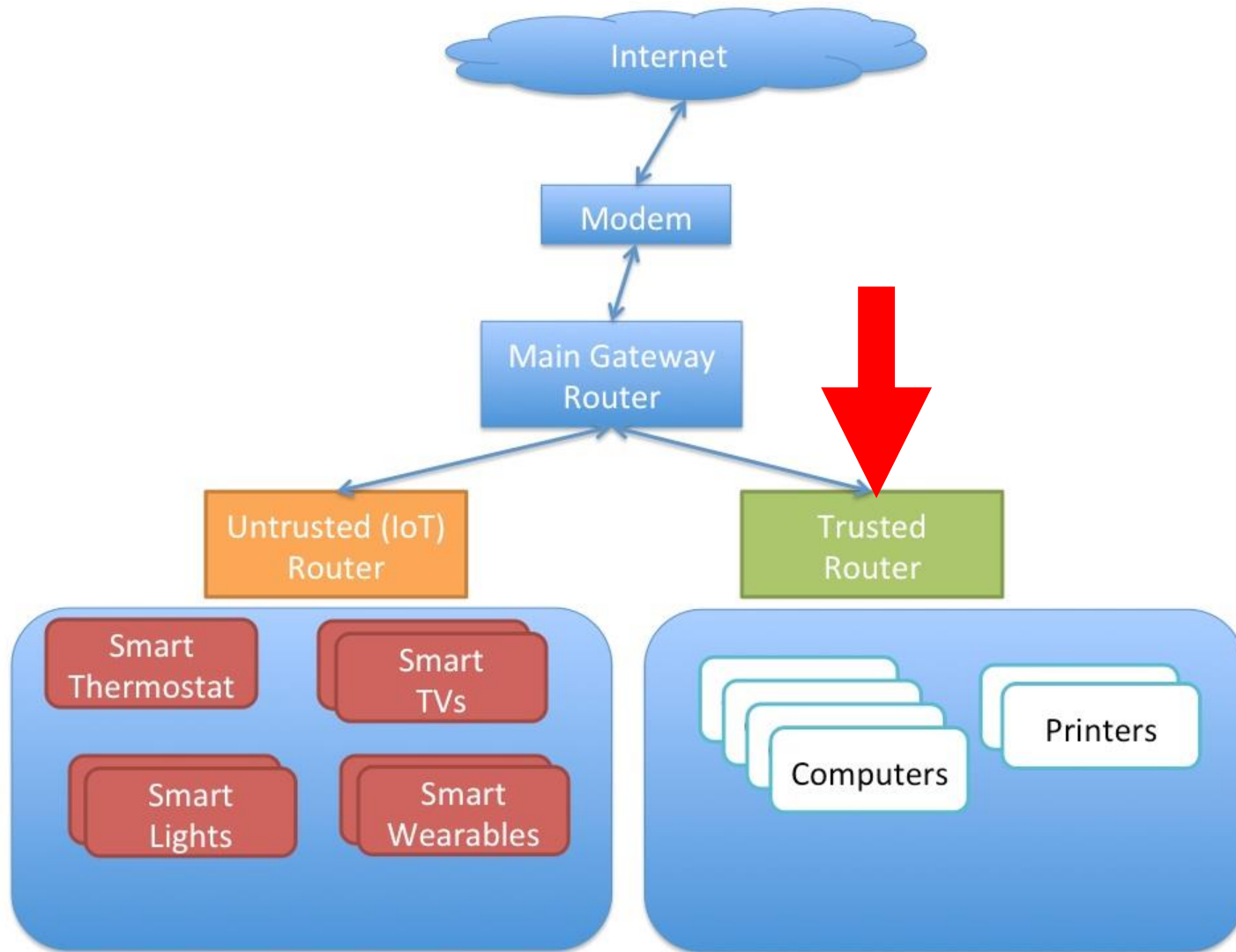
BASIC 3 (OR MORE) ROUTER CONCEPT (continued)

- Untrusted IoT Router:



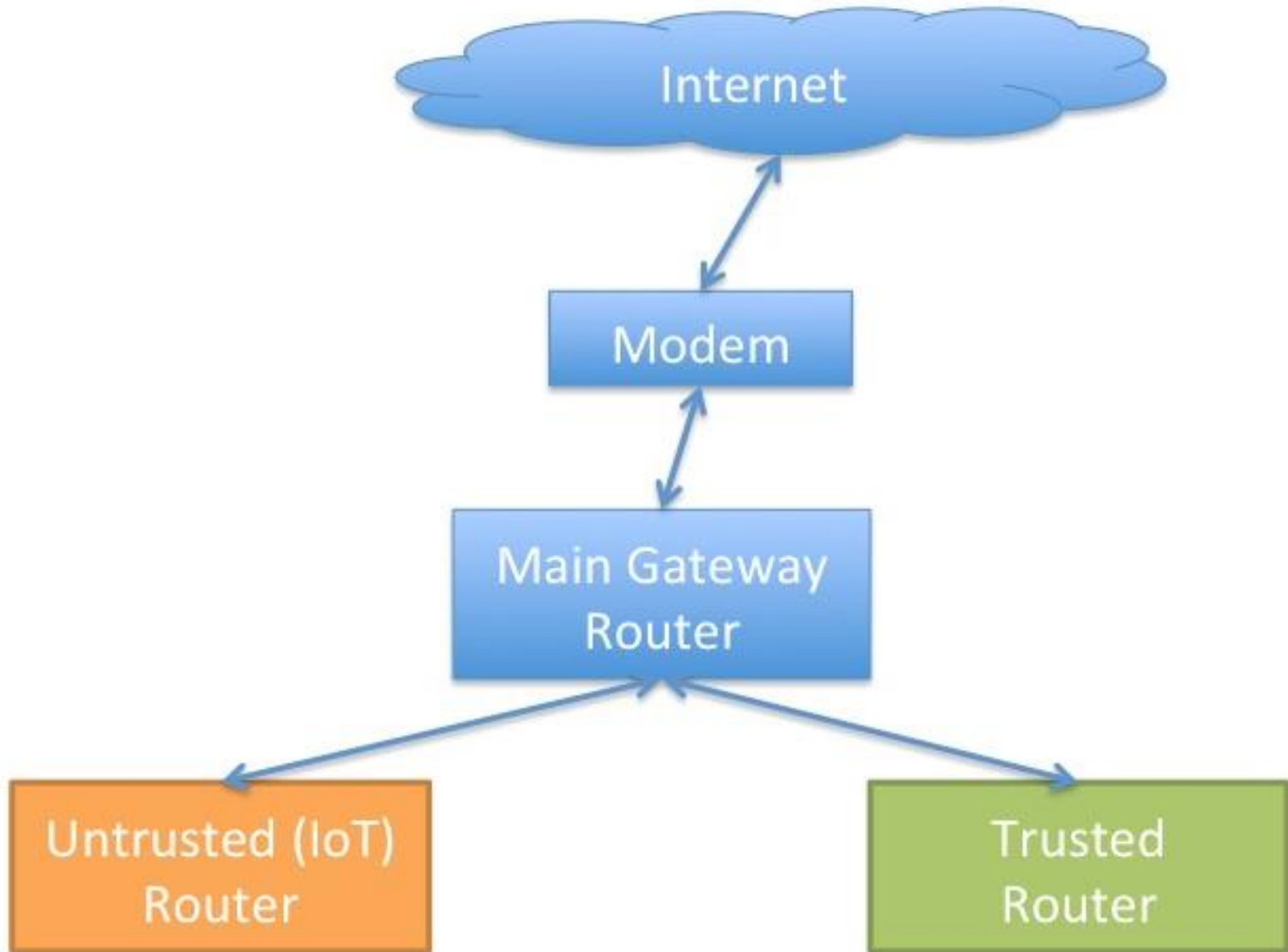
BASIC 3 (OR MORE) ROUTER CONCEPT (continued)

- Trusted Router:



BASIC 3 (OR MORE) ROUTER CONCEPT (continued)

- Basic Concept:
Internet providers modem or router connects to
Main Gateway Router
which has a LAN side that connects
to Untrusted (IoT) Router
and
to Trusted router



BASIC 3 (OR MORE) ROUTER CONCEPT (continued)

- Reference for the previous diagram:
[http://www.securityperspectives.com
/three-dumb-routers-are-coming-to-
a-home-network-near-you/](http://www.securityperspectives.com/three-dumb-routers-are-coming-to-a-home-network-near-you/)

BASIC 3 (OR MORE) ROUTER CONCEPT (continued)

- Also known as "3 dumb routers" as coined by Steve Gibson because the routers that are purchased for homes and small business are much dumber than that ones that larger businesses and organizations use.

PRIVATE IP ADDRESSING SCHEMES FOR "3 ROUTER CONFIGURATION"

- Scheme 1:
Use routers of default brands that default to different private IP address ranges
- Scheme 2:
Use routers that default to the same private IP address ranges₁₇

PRIVATE IP ADDRESSING SCHEMES FOR "3 ROUTER CONFIGURATION"

- Example of "Scheme 1":
(Use routers of default brands that default to different private IP address ranges):
Use a TP-Link router, a Netgear router, and a Linksys router

PRIVATE IP ADDRESSING SCHEMES FOR "3 ROUTER CONFIGURATION"

- Example of "Scheme 2":
(Use routers of default brands that default to the same private IP address ranges):
Use a three Linksys routers.

PRIVATE IP ADDRESSING SCHEMES FOR "3 ROUTER CONFIGURATION"

- "Scheme 2" requires more router configuration effort relative to "Scheme 1"
- A detailed explanation of "Scheme 2" can be found at <https://www.linkedin.com/pulse/3-dumb-routers-securing-your-home-smb-from-iot-internet-trevor-tye>

WARNINGS ABOUT SECURITY WEAKNESSES IN IoT DEVICES

- <https://krebsonsecurity.com/2016/02/iot-reality-smart-devices-dumb-defaults/comment-page-1/>

REFERENCES AND MORE IDEAS

- <https://robert.penz.name/1341/ready-your-home-network-for-iot/>

TESTING FOR SECURITY WEAKNESSES IN IoT DEVICES

- See the instructions for testing for the vulnerable IoT devices at <http://www.computerworld.com/article/3134092/networking/testing-for-vulnerable-iot-devices.html>

