DN001 – Designing WebBrick Networks

WebBrick Design Notes

Introduction

The WebBrick is basically a web-enabled configurable logic controller. It is configured to handle control tasks such as heating, lighting and door/drapery control.

Once configured, a WebBrick will carry out its tasks whether or not the network is connected. We call this **local control**.

Some tasks are delivered to the WebBrick by our Gateway appliance. This device holds global schedules for the building and keeps track of concepts such as occupancy. We call this **global intelligence**.

Gateway Network Interfaces

The Gateway comes equipped with two configured Ethernet interfaces (on some models there are 3 physical connections). These are configured thus:

- General Network default IP 192.168.1.5, Class C subnet.
- WebBrick Network default IP 10.100.100.1 Class A subnet.

Experience has taught us that WebBricks should be kept on a separate network. Here are some of the reasons:

- Broadcast Storms can disrupt Gateway-WebBrick commands.
- Multicast traffic can flood network switches.
- New nodes may accidentally clash with existing IP addresses.
- WebBricks implement password protection over HTTP (The gateway uses secure HTTPS).

The commands that go between the Gateway(s) and the WebBricks tend to be important. For example if a WebBrick misses the command to change the set-point for hot water, the result may be a cold shower for the home users.

Touch Screens

Where a touch screen is used solely for home automation there is an advantage in placing it on the same network as the WebBricks. This effectively isolates it from the home network.

Host files and DNS

The Gateway is configured to use both a hosts file and DNS.

WebBricks should be entered into the hosts file and not any local DNS server. This is to reduce the number of systems in the chain that may cause failure. A network of WebBricks and their Gateway will run quite happily without an Internet connection.

The **DNS** configuration is needed for the following functions:

- NTPD (Network Time) The gateway is configured to check network time and adjust accordingly. Network time is then propagated to the WebBricks.
- Configuration management, a Gateway may be configured to backup elements of configuration and log files to an external host.

Multimedia Systems

The Gateway can control some UPNP based media systems, for example Sonos. These systems can often generate a high network load, particularly in Multicast packets.

Most network switches at the value end of the market do not have multicast management built in and will therefore pass all such packets to all ports.

Therefore we require that multimedia systems are connected to the **general** network.

Network Switches and Hubs

Although these items can be considered a commodity there are some considerations.

First is quality, we are going to rely on a network to maintain the link between WebBricks and their Gateway (Actually you can have more than one Gateway).

Other considerations include:

- Can the network switch be run from a nominal 12V? If this is the case it can be powered from the URPS product and therefore keep the automation going through power failures (of particular use if LED Lighting is available).
- What is the power consumption? Network switches can be power hungry. Some

vendors are making versions specifically for the home market that have better power supplies.

Wireless bridging

It is possible to create a wireless bridge between a group of WebBricks and their Gateway. We recommend that all the WebBricks are configured on the local WebBrick network before installation on the remote network.

The key reason is that WebBricks are optimised for local LAN operation. Wireless networks that split and reformat packets will cause problems.

Synopsis

If you don't want to read this whole note then:

- WebBricks should be kept on a **separate dedicated** network.
- Multimedia systems should be placed on the **general** network.
- The Gateway provides the application portal **between** the two networks.

Liability Disclaimer

These notes are intended for individuals that are familiar with working with mains voltage and are aware of taking the necessary precautions. All WebBrick Application Notes are to be seen as guidelines only. WebBrick Systems cannot take any responsibility for the wiring carried out by individuals, or damage caused as a result of incorrect wiring.