

Raspberry Gate Boot-Then-Settings Strategy

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Introduction

This document describes how to setup Raspberry Gate with Raspbian (2018-04-18 release version) for Raspberry Pi 3. Raspberry Gate is a security gate box based Raspberry Pi 3 platform.

Raspberry Gate has a configuration file “/opt/raspg/etc/raspg.conf” to set up itself. File “raspg.conf” will be read by Raspberry Gate boot process program to give some functions to work as Raspberry Gate. Users can write “/opt/raspg/etc/raspg.conf” with display and keyboard which are connected to Raspberry Pi box. But Raspberry Gate box have no display and no keyboard when it is running because it works as a embedded network router or bridge. When users want to update Raspberry Gate’s configuration file, they can use USB storage with your own update file that named “raspg.txt”.

Configuration file from USB storage

Raspberry Pi 3 has four USB ports. One USB port will be connected with a extra Ethernet link adapter to LAN. Therefore there are 3 USB ports remains. Users may use a USB storage aka USB flash drive for additional storage to Raspberry Pi 3. USB storage must be formatted as FAT (FAT16/FAT32) that is default format for USB flash drive. Users may create “raspg.txt” on your PC and copy it into USB storage. Insert USB storage that have “raspg.txt” into USB port of Raspberry Gate box before boot-up. “raspg.txt” will be checked by Raspberry Gate boot process and automatically copy it into “/opt/raspg/etc/raspg.conf” if “raspg.txt” was updated.

Description

“raspg.txt” is YAML¹ like format style configuration file. YAML is a human friendly data serialization.

1. YAML <http://yaml.org/>

Mode

Configuration file must have “Mode:” description. If mode description is not found in configuration file, Raspberry Pi box works as normal Raspbian. Raspberry Gate has four type of modes that are router, bridge, normal, and maintain mode. Router mode makes Raspberry Gate as a network router. Bridge mode makes it as a network bridge. Normal and Maintain not effected, it means that users can use normal Rasbian.

Mode: router|bridge|normal|maintain

Network Interface

Interface device will be selected by automatically. Raspberry Pi’s embedded Ethernet Rj45 port becomes always “eth0” in system and it will be assigned to WAN (Wide Area Network / Internet). Another side is used for LAN (Local Area Network / Local computer side). When USB Ethernet adapter has been connected with Raspberry Pi box, it should be assigned to LAN. If USB Ethernet adapter is not connected to Raspberry Pi box, WiFi is assigned LAN as Wifi access point. USB Ethernet adapter and WiFi access point cannot use at same time.

LAN IP address assignment

When users select router mode, Raspberry Gate works as NAT box. Default LAN network address is as 192.168.72.0/24. DHCP service is provided by Raspberry Gate and assignment range of dynamic IP address is between “192.168.72.33” and “192.168.72.191”. Users can use between “192.168.72.2” and “192.168.72.32” for static IP address. If users want to assign other network address, use “NetworkAddress:” option as below;

NetworkAddress: 192.168.100.0/24

This example shows that network address is “192.168.100.0/24” and assigned dynamic IP address range is between “192.168.100.33” and “192.168.1.191”.

WiFi Setup

When users want to use Raspberry Gate as WiFi access point, SSID and Password are required. SSID and Password are used for WiFi clients to access to Raspberry Gate. To provide WiFi access point capability, use “WiFi:” option. NOTICE: If USB Ethernet adapter has been connected, Wifi is not available.

WiFi:

SSID: RaspGate

PW: 5aeb3338037m

Please don't use “-(minus)” with “SSID:” and “PW:” entry anymore.

update mode (not implemented yet)

If update mode is appeared in configuration file, Raspberry Gate checks update site, download update files, and apply update files to Raspberry Gate. “Update:” has two option “once” and “always”. Option “once” gives booting-then-update that update will run when Raspberry Gate booting. Option “always” gives running-and-update that update will run when Raspberry Gate is running. You don't want to update, remove this option description from “raspg.txt”.

Update: once|always

Raspberry Gate Filtering with Bridge mode and Router mode

Raspberry Gate can use iptables-base filtering with bridge mode and router mode.

This Raspberry Gate Secure Filtering Configuration file is used for generating iptables scripts of bridge mode filtering and router mode filtering each. This filtering configuration is almost same as the configuration of Raspberry Gate configuration file. You may put “rgf.txt” file on your USB storage as well as “raspg.txt”. “rgf.txt” is automatically moved to “/opt/raspg/etc/rgf.conf” which is used to create iptables commands.

rgf.txt Format

“rgf.txt” format is YAML as below:

```
debug: 10
domain:
  udp: allow
  tcp: deny

ssh:
  tcp: allow

http:  allow
https: allow
18080: allow

icmp: allow

default:  deny
```

Format details

“debug: 10” entry is used for debugging of generation iptables command. It is useful for developer but user may ignore this option.

“domain:” entry means port 53 and “udp: allow” means port 53 udp will be allowed. “tcp: deny” means port 53 tcp will be dropped. In other words, you can use DNS service but tcp port has been closed for malicious usage.

“ssh:” entry means port 22 and “tcp: allow” means port 22 tcp will be allowed. You can use ssh. But port 22 udp is not available in this case because default filtering is not allow any ports without allowed ports.

“http: allow”, “https: allow”, and “18080: allow” means that http, https and 18080 tcp/udp connections are allowed.

“icmp: allow” means all type of ICMP packets will be allowed to pass Raspberry Gate filtering. Default is not pass any type of ICMP packet.

“default: deny” means any connection is not allowed without explicitly allowed connection(s).

EOF