



## How To:

# FortiGate Guest Network using HPE Aruba ClearPass for captive portal

Version	Date	Modified by	Comments
1.0	22.12.2023	Anders Lagerqvist Ulises Cazares	First version using FortiOS 7.4.1 and ClearPass 6.11.6

## How to create a guest SSID on FortiGate with ClearPass captive portal

The goal of this document is to guide you through the steps required to implement a guest network solution based on Fortinet FortiOS 7.4.1 using a tunneled SSID with HPE Aruba ClearPass version 6.11.6. It is expected that this setup will remain relevant also for other recent versions.

This document does not cover using a bridge mode SSID.

As this document does not go into all details on how to configure a FortiGate or ClearPass, it is expected that the reader already has basic knowledge of these products.

It is a prerequisite to have proper certificates signed by a public CA (Certificate Authority) installed on both the FortiGate and on the ClearPass guest portal to avoid client warnings when they connect to the guest network. The certificate may be a wildcard certificate or unique to the two devices. Failing to use a public signed certificate may cause connection warnings and failure to successfully connect to the guest network.

## Required configuration on the FortiGate:

First step is to create ClearPass as a RADIUS server for the MAC-caching part and create the user-group that ClearPass should return after authentication is successful, in this example it is "Guest-Users".

Edit RADIUS Server

Name

Authentication method Default Specify

NAS IP

Include in every user group

Primary Server

IP/Name

Secret

Connection status ✔ Successful

Secondary Server

IP/Name

Secret

Connection status ✔ Successful

### Edit User Group

Name

Type

Members

### Remote Groups

+ Add
✎ Edit
🗑 Delete

Remote Server ▾	Group Name ▾
👤 ClearPass-Radius-SRV	Guest-Users
1	

Next step is to create the SSID with the desired names and features. In this example the FortiGate will also act as DHCP server for the guest users.

```

config wireless-controller vap
  edit "FortinetGuest"
    set ssid "FortinetGuest"
    set security captive-portal
    set external-web "fqdn-to-clearpass-guest-portal/guest/pagename.php"
    set mac-auth-bypass enable <- This is to allow MAC caching
    set selected-usergroups "Guest-Users"
    set security-exempt-list "FortinetGuest-exempt-list" <- This should allow http/https, dns etc to resolve
    set schedule "always"
  next
end
  
```

This is pretty much all on the FortiGate SSID configuration done, but you must also create the firewall policy to allow the guest users to connect to the ClearPass servers, to the Internet, and any other destinations after successful authentication on the ClearPass portal.

## Required configuration on the ClearPass guest portal:

You need to create two services in ClearPass Policy Server, one for the MAC caching, and one for the guest registration, in that order.

This is the MAC caching service:

Configuration » Services » Edit - FortiGuest Tunnel MAC caching

Services - FortiGuest Tunnel MAC caching

Summary Service Authentication Authorization Roles Enforcement

**Service:**

Name:	FortiGuest Tunnel MAC caching
Description:	Service performing authentication for cached MAC entries for guest accounts
Type:	MAC Authentication
Status:	Enabled
Monitor Mode:	Disabled
More Options:	Authorization

**Service Rule**

Match ALL of the following conditions:

	Type	Name	Operator	Value
1.	Connection	SSID	EQUALS	FortinetGuest
2.	Radius:IETF	Service-Type	BELONGS_TO	Login-User (1), Call-Check (10)
3.	Radius:IETF	NAS-Port-Type	BELONGS_TO	Virtual (5), Ethernet (15), Wireless-802.11 (19)
4.	Connection	Client-Mac-Address	EQUALS	%{Radius:IETF:User-Name}

**Authentication:**

Authentication Methods:	[Allow All MAC AUTH]
Authentication Sources:	[Endpoints Repository] [Local SQL DB]
Strip Username Rules:	-

**Authorization:**

Authorization Details:	1. [Time Source] [Local SQL DB] 2. [Guest User Repository] [Local SQL DB]
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**Roles:**

Role Mapping Policy:	FortiGuest_MAC_Authentication Guest MAC Authentication Role Mapping
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**Enforcement:**

Use Cached Results:	Disabled
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The role mapping shown to allow the “MAC Caching” role, rest is same as regular guest role mapping.

Configuration » Services » Edit - FortiGuest Tunnel MAC caching

### Services - FortiGuest Tunnel MAC caching

Summary Service Authentication Authorization Roles Enforcement

Role Mapping Policy: FortiGuest\_MAC\_Authentication Guest MAC Authentication Role Mapping Modify

**Role Mapping Policy Details**

Description:

Default Role: [Other]

Rules Evaluation Algorithm: evaluate-all

Conditions	Role
1. (Authorization:[Endpoints Repository]:Unique-Device-Count EXISTS ) AND (Authorization:[Time Source]:Now DT LESS_THAN %{Endpoint:MAC-Auth Expiry}) AND (Authorization:[Guest User Repository]:AccountExpired EQUALS false) AND (Authorization:[Guest User Repository]:AccountEnabled EQUALS true)	[MAC Caching]
2. (Endpoint:Guest Role ID EQUALS 1)	[Contractor]
3. (Endpoint:Guest Role ID EQUALS 2)	[Guest]
4. (Endpoint:Guest Role ID EQUALS 3)	[Employee]

The enforcement policy to allow access without requiring Captive Portal if you already have a valid guest account is shown here:

Configuration » Enforcement » Profiles » Edit Enforcement Profile - FortiGuest\_MAC\_Authentication MAC Caching Allow Access Profile

### Enforcement Profiles - FortiGuest\_MAC\_Authentication MAC Caching Allow Access Profile

Summary Profile Attributes

**Profile:**

Name: FortiGuest\_MAC\_Authentication MAC Caching Allow Access Profile

Description:

Type: RADIUS

Action: Accept

Device Group List: -

**Attributes:**

Type	Name	Value
1. Radius:Fortinet	Fortinet-Group-Name	= Guest-Users
2. Radius:IETF	User-Name	= %{Endpoint:Username}

Note the “Guest-Users” being sent, need to match what you created on the FortiGate earlier. Also sending the User-Name to see that on the FortiGate when looking at the users.

The 2<sup>nd</sup> service to use the Captive Portal is shown here:

Configuration » Services » Edit - FortiGuest Tunnel Guest Registration

### Services - FortiGuest Tunnel Guest Registration

Summary Service Authentication Authorization Roles Enforcement Accounting Proxy

**Service:**

Name:	FortiGuest Tunnel Guest Registration
Description:	Service for guest access via captive portal (non-802.1x)
Type:	RADIUS Enforcement ( Generic )
Status:	Enabled
Monitor Mode:	Disabled
More Options:	1. Authorization 2. Accounting Proxy

**Service Rule**

Match ALL of the following conditions:

Type	Name	Operator	Value
1. Radius:IETF	Connect-Info	EQUALS	web-auth
2. Radius:IETF	Service-Type	EQUALS	Login-User (1)
3. Radius:IETF	NAS-IP-Address	BELONGS_TO_GROUP	Fortinet Devices

**Authentication:**

Authentication Methods:	1. [PAP] 2. [MSCHAP] 3. [CHAP]
Authentication Sources:	[Guest User Repository] [Local SQL DB]
Strip Username Rules:	-
Service Certificate:	-

**Authorization:**

Authorization Details:	1. [Endpoints Repository] [Local SQL DB] 2. [Guest User Repository] [Local SQL DB]
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**Roles:**

Role Mapping Policy:	FortiGuest_MAC_Authentication Guest MAC Authentication Role Mapping
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Note the NAS-IP-Address where the FortiGate is included in the group.

Standard guest role mapping rule:

Configuration » Services » Edit - FortiGuest Tunnel Guest Registration

### Services - FortiGuest Tunnel Guest Registration

Summary Service Authentication Authorization Roles Enforcement Accounting Proxy

Role Mapping Policy: FortiGuest\_MAC\_Authentication Guest MAC Authentication Role Mapping Modify

**Role Mapping Policy Details**

Description:	
Default Role:	[Other]
Rules Evaluation Algorithm:	evaluate-all

Conditions	Role
1. (Authorization:[Endpoints Repository]:Unique-Device-Count <b>EXISTS</b> ) AND (Authorization:[Time Source]:Now DT <b>LESS_THAN</b> %{Endpoint:MAC-Auth Expiry}) AND (Authorization:[Guest User Repository]:AccountExpired <b>EQUALS</b> false) AND (Authorization:[Guest User Repository]:AccountEnabled <b>EQUALS</b> true)	[MAC Caching]
2. (Endpoint:Guest Role ID <b>EQUALS</b> 1)	[Contractor]
3. (Endpoint:Guest Role ID <b>EQUALS</b> 2)	[Guest]
4. (Endpoint:Guest Role ID <b>EQUALS</b> 3)	[Employee]

Standard guest enforcement, which sends over the “Guest-User” to FortiGate and updates the account expiration time:

Configuration » Enforcement » Policies » Edit - FortiGuest\_MAC\_Authentication Guest Self Registration Enforcement Policy

Enforcement Policies - FortiGuest\_MAC\_Authentication Guest Self Registration Enforcement Policy

Enforcement policy has not been saved

Summary	Enforcement	Rules
<b>Enforcement:</b>		
Name:	FortiGuest_MAC_Authentication Guest Self Registration Enforcement Policy	
Description:		
Enforcement Type:	RADIUS	
Default Profile:	FortiGuest_MAC_Authentication MAC Caching Allow Access Profile	
<b>Rules:</b>		
Rules Evaluation Algorithm: First applicable		
Conditions	Actions	
1. (Tips:Role EQUALS [Guest])	FortiGuest_MAC_Authentication MAC Caching Allow Access Profile, Set MAC-Auth Expiry	

For the guest portal settings, you decide if you want sponsor based, send SMS etc like always, and for the NAS vendor settings, you can just use the default Fortinet FortiGate:

Home » Configuration » Pages » Self-Registrations

### Customize Self-Registration (FortiGate Tunnel Guest Registration)

Use this form to make changes to the self-registration instance **FortiGate Tunnel Guest Registration**.

**Customize Self-Registration**

**Login**  
Options controlling logging in for self-registered guests.

Enabled:	Enable guest login to a Network Access Server
* Vendor Settings:	Fortinet FortiGate <span style="float: right;">Revert</span> <small>Select a predefined group of settings suitable for standard network configurations.</small>
Login Method:	Controller-initiated — Guest browser performs HTTP form submit <span style="float: right;">Revert</span> <small>Select how the user's network login will be handled. Server-initiated logins require the user's MAC address to be available, usually from the captive portal redirection process.</small>

**Default Destination**  
Options for controlling the destination clients will redirect to after login.

* Default URL:	https://www.fortinet.com <small>Enter the default URL to redirect clients. Please ensure you prepend "http://" for any external domain.</small>
Override Destination:	<input type="checkbox"/> Force default destination for all clients <small>If selected, the client's default destination will be overridden regardless of its value.</small>

Save Changes
Save and Continue

\* required field

It is still possible to use the previously used “Custom” settings, but if so, must add the details in the “Extra Fields” settings like this:

Customize Self-Registration	
<b>Login</b> Options controlling logging in for self-registered guests.	
Enabled:	<input type="checkbox"/> Enable guest login to a Network Access Server
* Vendor Settings:	Custom Settings <small>Select a predefined group of settings suitable for standard network configurations.</small>
* Submit URL:	https://:1003/fgtauth <input type="button" value="Revert"/> <small>The URL of the NAS device's login form.</small>
* Submit Method:	POST <small>Choose the method to use when submitting the login form to the NAS. Security Warning: When using GET, user credentials may be displayed in the browser address bar, cached by the browser, or retained in web server logs.</small>
* Username Field:	username <small>The name of the username field for the NAS device's login form.</small>
* Password Field:	password <small>The name of the password field for the NAS device's login form.</small>
* Password Encryption:	No encryption (plaintext password) <small>Choose the type of password encryption to use when logging into the NAS.</small>
Extra Fields:	magic={\$extra_fields.magic} <small>Specify any additional field names and values to send to the NAS device as name=value pairs, one per line.</small>
Username Suffix:	 <small>The suffix is automatically appended to the username before logging into the NAS.</small>
<b>Default Destination</b> Options for controlling the destination clients will redirect to after login.	
URL Field:	 <small>The name of the destination field required by the NAS.</small>
* Default URL:	https://www.fortinet.com <small>Enter the default URL to redirect clients. Please ensure you prepend "http://" for any external domain.</small>
Override Destination:	<input type="checkbox"/> Force default destination for all clients <small>If selected, the client's default destination will be overridden regardless of its value.</small>
<input type="button" value="Save Changes"/> <input type="button" value="Save and Continue"/>	

Note that the “Submit URL:” is the IP or FQDN of the FortiGate guest interface. It is highly recommended to use https and port 1003 for the captive portal, but if you are using http, ensure that the port number used is 1000.