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Test Light – Meaning

When an access point, whether connected directly to the controller or connected via the network, displays a solid orange test light, it means that the Access Point is not able to finish its boot sequence.

There are many reasons that could cause this, but mainly it is because the access point is not able to receive the minimum of information it requires to finish the boot procedure. This application note will address the most common causes for this condition and how to recover from it.

Known Possible Causes

1- Lack or Misconfiguration of DHCP server

At the very least, the APs need to receive an IP Address, Net Mask, Default Gateway and DNS parameters from the DHCP server.

If the Access Point is unable to receive any or all of these requirements, the test light will stay lit and the Access Point will not be recognized by the controller.

The best way to test whether the DHCP server is correctly configured is to connect a computer to the port where the Access Point will be and verify the IP address received, and then ping the IP address of the controller. If the ping is successful, it means that the Access Point should be able to reach the controller.

The Access Point can have its IP information configured statically by using the wireless controller. **However**, the only way to set up static information is to first assign it dynamically via DHCP - Otherwise the controller would not be able to communicate with the access point to relay the new settings in the first place. If this information is programmed and the controller cannot be contacted the AP will not boot.

NOTE: It is necessary that the IP Address and Default Gateway for the AP are in the same IP network range. **Setting up a Gateway in a different IP network address than the one used for the Access Point will result in making the Access Point permanently inaccessible.**

Please see Appendix below for Dynamic and Static Boot sequences

2- Incorrect Country Settings

There are two Regulatory Domains, North America (NA) and rest of the world (WW).

If the Access Points and the Wireless Controller belong to different regulatory domains, the APs will be unable to boot.

The regulatory domain in the wireless controller can be changed by selecting a different country in the initial setup. In the Access Points it depends entirely on what firmware image was loaded, either at the moment of manufacture, or in the case of WG102/WAG102 when it is upgraded to a lightweight code.

This means that a WGL102 or WAGL102 purchased in a different country than the controller, with a different region firmware, may not be used with the WFS709TP unless the wireless controller is configured to be in the same regulatory domain of the Access Point.

3- More than 16 Access Points configured per Wireless Controller

Each controller can only control 16 (sixteen) access points. If more than sixteen access points are connected, the controller will not provision the additional access points, which results in a test light on the unprovisioned access point(s). If a provisioned access point is removed from network, an unprovisioned access point can then be provisioned.

This becomes particularly relevant when more than one wireless controller in the network, as there is likely going to be more than 16 access points. In this case, make sure that the load is spread correctly across the different controllers. This can be controlled by either assigning LMS (Local Master Switch) to particular location codes, or to Access Points singularly.

4- Incorrect VLAN setup

Incorrect VLAN configuration can cause this issue under several circumstances, but the most notable are the following:

- **Access Point in different VLAN than controller.**

If the Access Point is connected to a port that is part of a VLAN that is not configured in the Wireless Controller, the Access Point will not be able to communicate with the WFS709TP and accordingly it will not be able to finish the booting procedure.

- **Access Point unable to reach controller.**

Even if all VLANs are configured in the controller, the Access Point may not be able to communicate with the WFS709TP if the VLAN trunks are not configured properly.

The best way to test communication between the port where the Access Point will be connected and the WFS709TP is to connect a computer to that port and ping the IP address of the controller. If the ping is successful, it means that the Access Point should be able to reach the controller.

- **Incorrect IP/DHCP information given to the AP in respect to the VLAN used by controller.**

Misconfiguration of the DHCP server or incorrect static IP information can lead to this issue. If the Access Points are in a different IP range than the one that the VLAN interface for the Wireless Controller uses, they will be unable to communicate. Likewise, incorrect gateway or DNS settings could lead to this same issue.

The particular VLAN IP and routing needs to be kept in consideration at the time of deployment.

Appendix: AP Boot Sequence

These steps describe the booting procedure of each Access Point from the moment they're powered on until they're ready to either be provisioned, or ready to transmit and receive.

The procedure is slightly different when the APs are configured statically and dynamically, as dynamically they must discover all their communication variables, while statically they just have to load them from their own memory.

Dynamic:

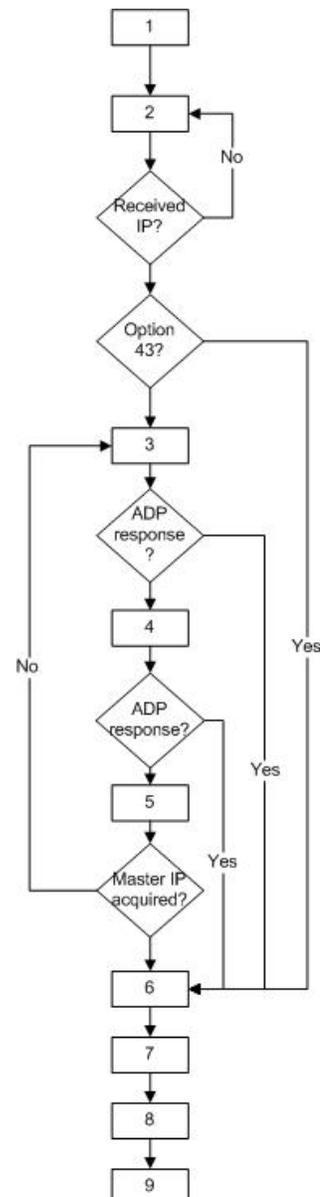
1. AP loads location ID from BootROM.
2. AP sends out a DHCP request. If no DHCP information is received, the AP will rebroadcast regularly trying to acquire an IP address.

If DHCP response includes vendor option 43 (masterip), the AP will use this for Master IP address and proceed to Step 6.

3. If no vendor option specified, AP sends "ADP" packet to Multicast group 224.0.82.11. If it receives a response, proceed to Step 6.
4. If no response to Multicast ADP, AP sends "ADP" packet as L2/L3 Broadcast (configure Master Netgear Wireless Switch as a DHCP helper recipient). If it receives a response, proceed to Step 6.
5. If there is no response, the AP sends a DNS query to the server given by DHCP for "Netgear-master.domain.com" where "domain.com" is the domain parameter given by DHCP. Then, the AP will use this for Master IP address. If it receives a response, proceed to Step 7.

At this point, if still hasn't been able to acquire IP information for it's master controller, the Access Point will return to Stage 3.

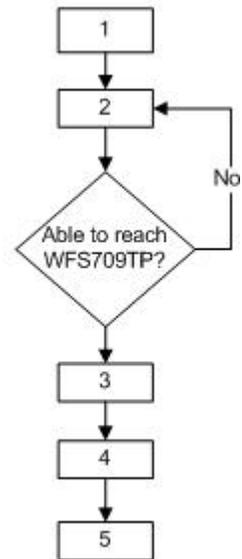
6. AP sends message to the wireless controller with it's location ID.
7. If needed, the AP sends TFTP request to the wireless controller and downloads OS image.
8. Based on the AP's Location ID, the current switch may take control of this AP or direct it to another switch.
9. If it necessary, the AP authenticates to new switch and establishes GRE tunnel.



Static:

These steps will be followed if the Access Points were previously statically programmed with at least an LMS IP (Local Master Switch, the wireless controller IP).

1. AP loads variables from BootROM.
2. AP sends message to the wireless controller with it's location ID. If the Access point is unable to reach the wireless controller, it will continue to try to send the same message until it contacts the WFS709TP.
3. If needed, the AP sends TFTP request to the wireless controller and downloads OS image.
4. Based on the AP's Location ID, the current switch may take control of this AP or direct it to another switch.
5. If it necessary, the AP authenticates to new switch and establishes GRE tunnel.



Of notice, by default all WFS709TP compatible APs will have a location code of 0.0.0, which remains until it is changed by the controller.

NOTE: If there are two APs with the same location code allocated, both of them will boot but only one will transmit and receive data.