How to correctly mount wireless Access Points

By Pranay Pancholi – Loughborough University – April 2015

1. Introduction

Over the past five years there has been a significant rise in the number of wireless access points deployed within enterprise workspaces, enabling mobility and support for new mobile devices such as smartphones, tablets and portable laptops. As more users are now heavily dependent on using Wi-Fi networks, the challenge is to ensure that wireless networks are optimized to meet user expectations.

This document will provide some recommendations by installing wireless access points (APs) correctly and provide simple methods to minimise any long-term Wi-Fi problems.

2. Recommendations

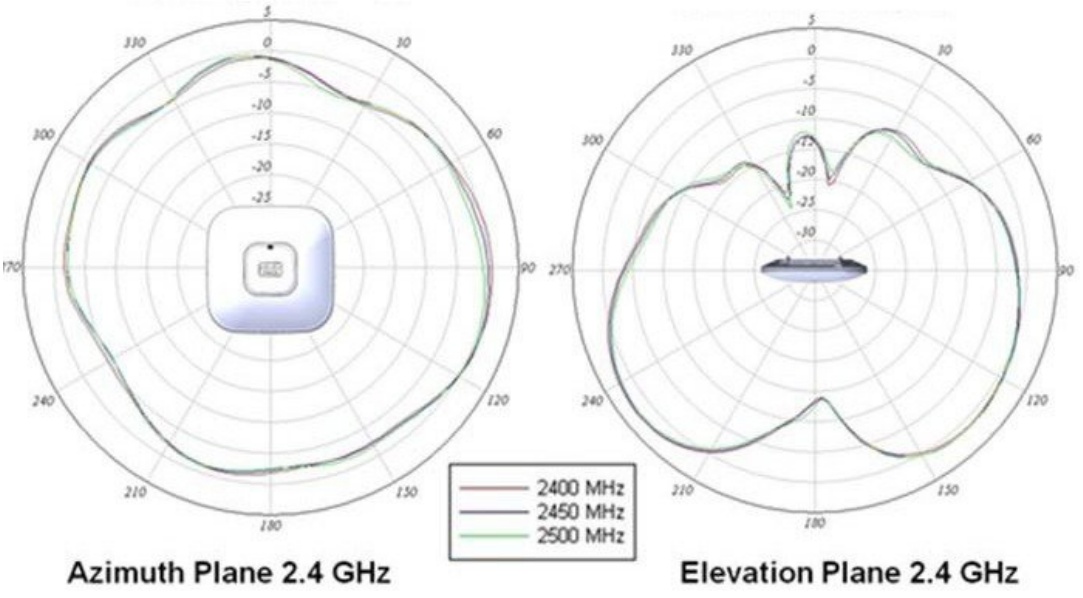
AP Placement – Ceiling Mounted

- When mounting APs, how they are placed within their designated environment is of great importance. In most enterprise locations, APs are often installed on either false ceiling grids or attached onto mounting brackets as shown below.

The access point is easily accessible by using standard A-frame ladders for replacements or swap outs during any faults.

- Avoid mounting APs too high on ceilings. If mounted too high, gaining access for replacement or maintenance purposes can be a problem, as shown below. You may require a mini-tower to gain access safely and that can be difficult to arrange.

- Models with internal antennas normally emit signals in a doughnut based radiation pattern. If APs are mounted too high then a high percentage of the signal can be lost before it reaches its desired area.

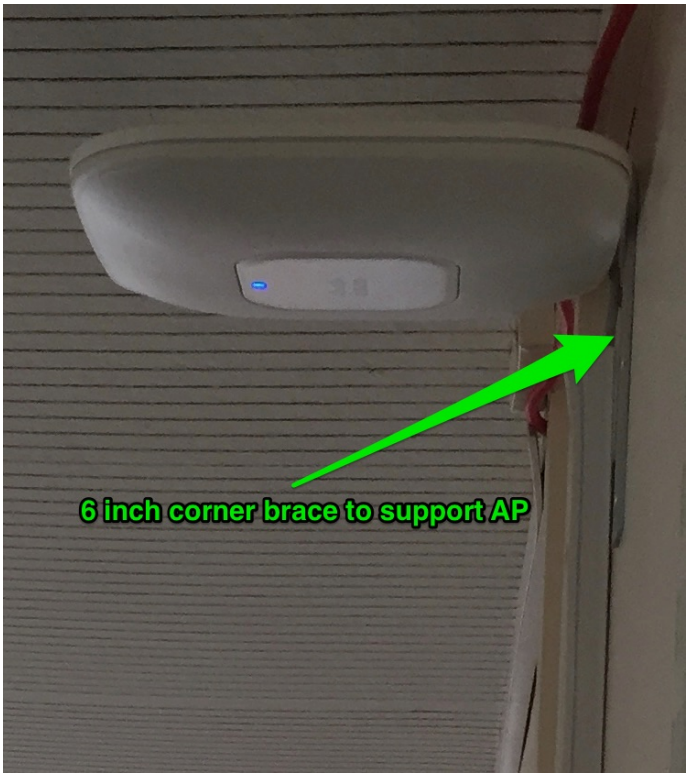


AP Placement – Wall Mounted

- Where possible, try to avoid mounting an AP flush against a wall, as most of the RF output will not be serving its intended purpose. APs with internal antennas are designed to be mounted on ceilings to provide 360-degree coverage.

- There are solutions that enable APs with internal antennas to be mounted correctly. Oberon manufactures various types of wall mounts that can be used to mount APs onto walls.

- Alternatively you can use 6-inch corner braces to help secure an AP on a wall. However this only applies if the manufacturer's mounting bracket holes line up with corner braces.



- There may be no choice but to mount APs high on ceilings. If so, it is advisable to use external directional antennas to direct the signal to the intended target area. The antennas should be installed in a vertical

orientation. Avoid having antennas mounted in a horizontal position as this often reduces coverage.

Poor Installations

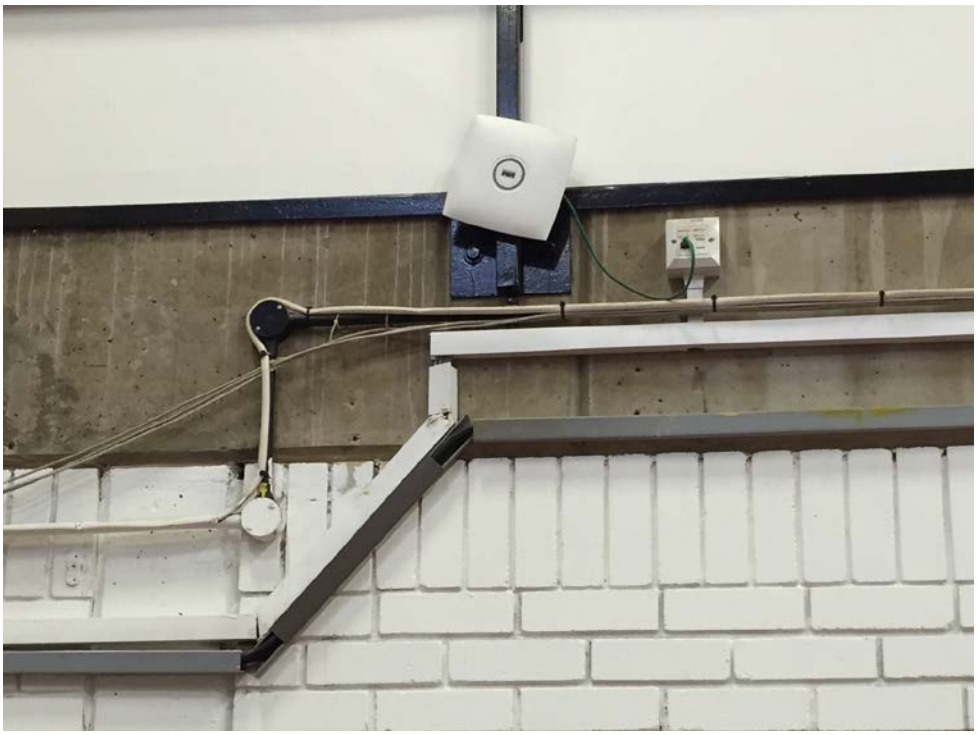
The photos below show some examples of poorly installed access points.

- Always try to avoid metal objects

- Avoid enclosing an AP by using a metal cage as in the example below

If a wall mounted AP requires protecting, then it's best to use a plastic Sarel enclosure and use the correct type of antennas as shown below.

- The AP should be securely mounted, ensuring that it cannot move about or fall. Ensure APs are secure, level and keep as close as possible to user areas.

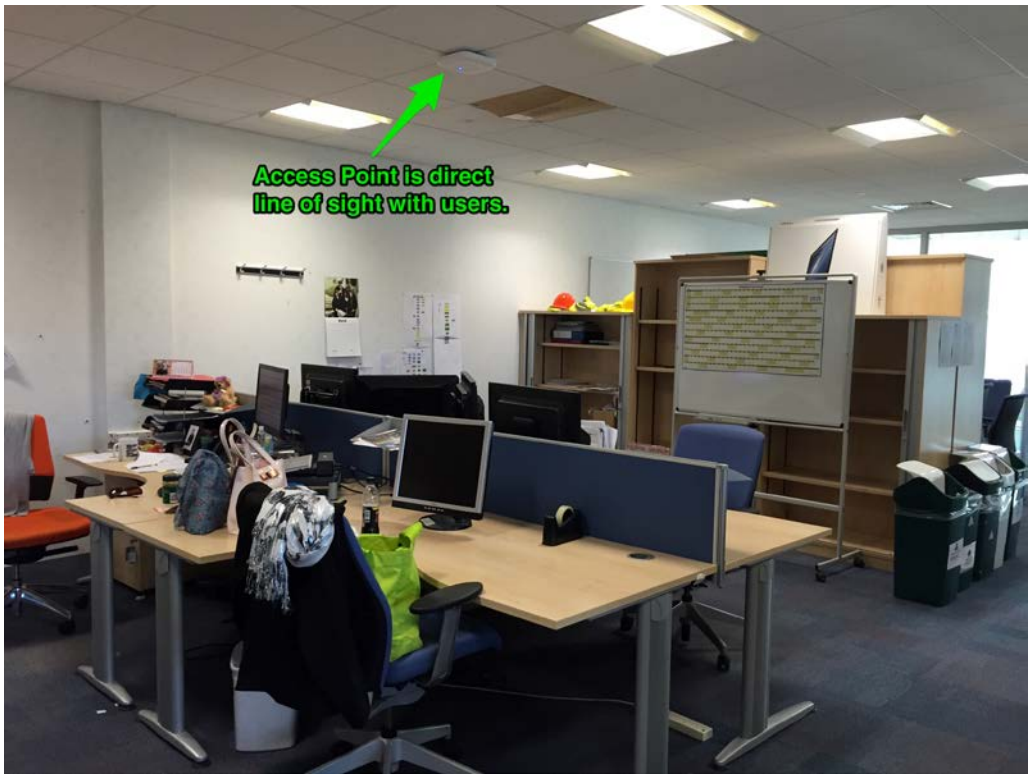


Padlocks can be used to secure APs onto mounting brackets to stop any APs being accidently knocked out of place and to reduce the risk of it being stolen.

Padlocked AP

AP installed in the corridor area

In the above scenarios, the main users are behind the walls or partitions, therefore the AP should be installed inside the office spaces rather than the corridors. The APs are best served when close to end users, benefiting from greater signal strength and higher connection rates.



- Try to avoid installing APs above suspended ceilings. The grid-work and large metal objects such as ducts, containments and lighting all affect signals and cause an increase in multipath. Although from an aesthetic point of view the APs are hidden, it can cause problems for administrators to try and locate them for any required maintenance.

Conclusion

It can be difficult for network administrators to provide a good wireless service for the end users. It most cases this can be due to poor installation of APs as described and illustrated above. To minimise problems, it is best to:

- Avoid placing APs in corridor spaces as Wi-Fi will become poor by the time the signal reaches the client. Obstructions that will block the RF include fire-doors, glass panels, bookcases etc. In order to achieve the best possible user experience, install the APs as close to the users as possible
- Keep APs away from objects that will interfere with RF signal such as metal objects that will cause issues with multipath
- Ensure APs are mounted securely
- Make sure APs have correct orientation when mounted and avoid wall-mounting APs at 180°
- Use antennas if required
- Ensure you conduct a wireless site survey prior to installing. A site survey will able to identify signal strength, existing RF presence, locate dead spots, etc. Further information for conducting site survey can be found by visiting: https://community.ja.net/groups/wtas-wireless-technology-advisory-service/document/ekahau-overview-site-surveys.
- APs should be deployed based on the site survey
- Understand what the user requirements are within the desired area. Check what types of clients are needed to use Wi-Fi. Are clients using smartphones, tablets or are laptops being used?
- As for Ethernet recommendations - most APs will operate fine with CAT-5e specified cabling. However for new cable installations CAT6a specified should be used as this supports the 10GE standard.

By following the above best practices we are then able to provide a more efficient wireless service as part of on-going wireless deployments. Due to many building constraints it is important to work closely with facilities' departments to ensure any cabling or fitting requirements are met prior to installations.

Contact

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