



# THE BENEFITS OF WIRELESS LAN MANAGEMENT IN THE CLOUD

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How the cloud maximizes IT productivity and minimizes IT costs

### Introduction

Wireless devices have changed the way organizations and their users interact. Mobile smartphones, tablets, laptops, and wireless enabled devices have driven the mindset that wireless networks must be ubiquitous, fast, and constantly available. These are demands that have traditionally put organizations and their users in direct contrast with their IT departments, as constructing and maintaining wireless infrastructures have typically been time- consuming, complex, and costly endeavors.

Software-as-a-service (SaaS) has, over the past decade, revolutionized the way organizations manage their customer relationships and sales team activities. Using SaaS applications such as salesforce.com™, organizations have been able to drive down IT costs and focus their efforts more towards customer management and sales execution. In a similar manner, SaaS promises to bring similar benefits and changes to applications such as wireless network management.

### Cloud Service

In its most basic form, cloud computing refers to the ability to deliver software, hardware, or infrastructure over the Internet in real-time, with instantaneous access by any device with access to the Internet — regardless of location and time. By provisioning these activities in the cloud, organizations are able to abstract the day-to-day manifestations of these activities (running server hardware, installing software, maintaining service packs, etc.) from their IT organizations. As IT organizations no longer have to concern themselves with the administration of such computing resources in-house, they are then able to:

- **Divest Workload** — IT organizations can free themselves of the burden and time associated with computing resource management
- **Reduce Capital Expenditure** — IT organizations no longer need to purchase and replace hardware and software through its lifecycle

Cloud management maximizes IT productivity and minimizes IT costs.

- **Reduce Operational Expense** — IT organizations can shift the burden of supporting, updating, and patching hardware and software on to the cloud provider
- **Maximize Productivity** — IT organizations can then focus on higher-level business value activities needed by their organizations

## Wireless Management Architectures

Wireless network architecture has, over the past decade, evolved through several distinct phases:

### 1. Standalone “Fat” Access Points

First generation wireless access points functioned as autonomous network elements. These required discrete setup and maintenance on an individual-AP basis — i.e. management functions were performed via CLI or http access on each AP, one at a time. This quickly proved to be very burdensome in environments with dozens of APs, let alone environments with hundreds or thousands of APs, as routine maintenance tasks required an administrator to log on to each and every AP.

### 2. Controller-Driven Architectures with “Thin” APs

In order to solve management headaches associated with standalone APs, wireless LAN vendors next introduced controller based systems wherein the APs were “thin” — i.e. they were based on inexpensive hardware and required a central controller (for a given set of APs) to operate. Management of APs was collapsed onto the controller.

However, drawbacks to this architecture included:

- a. **Expense** — fully loaded controllers were often extremely expensive
- b. **Installation costs** — Every AP required direct cabling back to the controller
- c. **Failure modes** — a controller represented a single point of failure for hundreds of APs

### 3. Controller-Driven Architectures with “Tunnelling” APs

In order to solve the issues related to controller based architecture with thin APs, wireless LAN vendors introduced systems wherein the APs would tunnel traffic back to the controller at Layer 3 and above, thus solving the direct cabling costs incurred with earlier controller based architecture. However, this strategy introduced further challenges including:

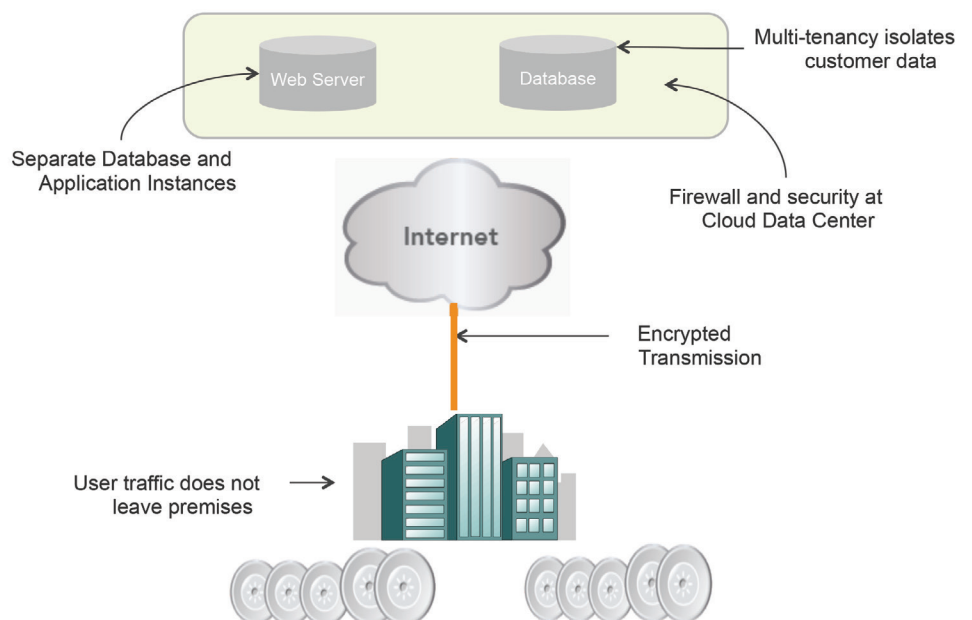
The Avaya Cloud Networking Platform simplifies wireless and wired deployments.

- a. **Catastrophic Failure Modes** — as the controllers are in the data path of the APs, a failure of the controller results in the inability of hundreds of APs and thousands of clients to send network traffic
- b. **Limited Scalability** — Tunneling traffic from APs to controllers requires significant processing power, thus limiting the ability for the controllers to scale to ever larger environments
- c. **Expense** — Many such solutions still require separate management servers

## Avaya Cloud Networking Platform - Wireless Management

Avaya integrates the data-path controller function into its Wireless APs to distribute the intelligence, much like wired edge switches. By distributing the network, IT administrators realize better scalability, resiliency, and overall performance compared to architectures based on centralized functionality. No centralized controller is needed. With greater computing power built into each AP compared to traditional APs, functions such as application-level visibility and control can be executed directly at the network edge in each device. Specifically:

- No controller is needed for traffic control plane — all traffic control decisions are made by the AP.
- No controller is needed for the traffic data plane — all wireless client traffic is presented to the LAN at the AP — data need not be tunneled back to a centralized controller.



Several benefits are realized with the Avaya approach:

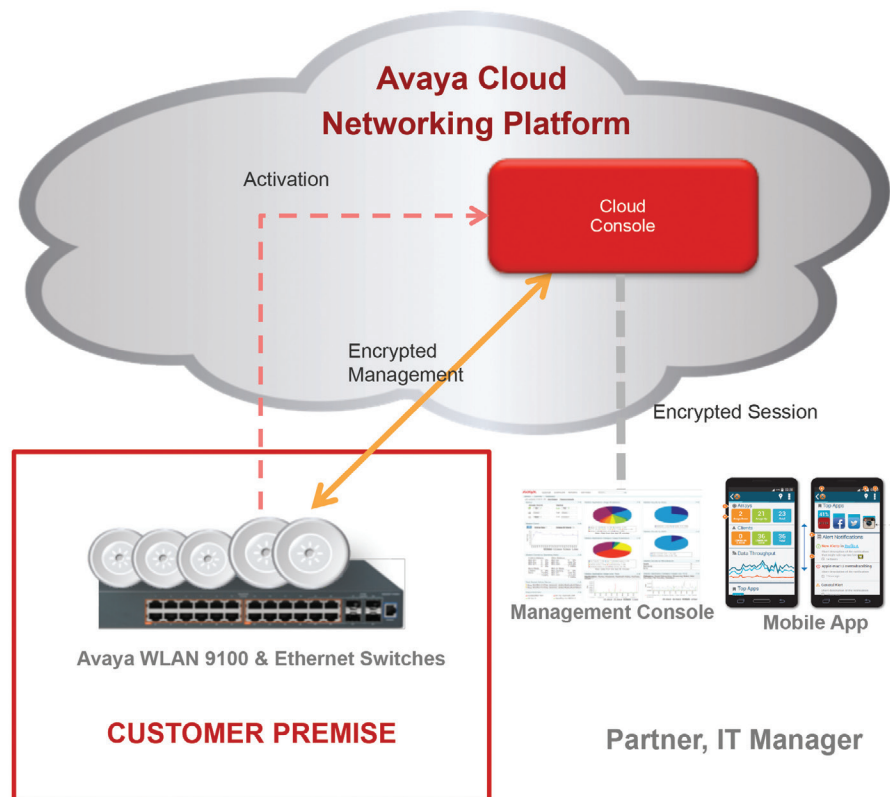
- **Ease of Management** — all management is performed remotely through a web browser. As the management function is hosted on the web, operational administrative tasks that are relevant to controller architectures are eliminated — the purchase, update, support renewal, and HW maintenance of a separate controller is not required .
- **Near Limitless Scalability** — The Avaya architecture does not depend on a centralized controller for either wireless traffic control plane or wireless traffic data plane management. This key differentiating characteristic allows unparalleled scalability of wireless network environments without needing to upgrade or resize a wireless LAN controller.
- **Data Privacy** — Client traffic is kept entirely on the organization's LAN as the Avaya Cloud Networking Platform only communicates management (configuration, setup, administration, and report) traffic to the APs. The Avaya Cloud Networking Platform is out of band of client data.
- **Secure Management** — Control Traffic Between the APs and the Cloud Networking Platform are conducted through a secure tunnel. Challenge Based Authentication is employed and passwords are never transferred via cleartext. Encryption is accomplished via MD5 for 128 bits key generation and BlowFish for actual data.
- **Security of the Organization's Perimeter** — The standard-based encrypted tunnels between the Avaya Cloud Networking Platform and the APs are initiated by the APs and not by the Avaya Cloud Networking Platform, thus ensuring that the organization's firewall need not to have a port open on inbound connections.
- **Redundancy** — Multiple geographically distributed data centers are used to host the Avaya Cloud Networking Platform, thus ensuring that the management system continues to function even in the event of a catastrophic failure of one data center.
- **High Availability** — As the Avaya Cloud Networking Platform is out of band. In the event that the organization's link to the Internet is interrupted, client data traffic continues to flow normally — only configuration and administrative changes are impacted during an Internet connection outage.
- **Zero-touch Deployment** — The provisioning of a wireless network requires deployment of only APs — Avaya provisions and maintains the management system in the cloud. Sizing, installation, configuration, and maintenance of a controller for management or traffic control plane is eliminated.

- **Minimal IT Administration** — Because the Avaya Cloud Networking Platform is hosted by Avaya, updates and upgrades to the software are completely managed by Avaya during scheduled maintenance windows and are transparent to the organization's IT staff. Firmware upgrades of the wireless APs under cloud management are also conducted by Avaya, making time-intensive infrastructure maintenance a thing of the past.

## Avaya Cloud Networking Platform — Wired Management

A key differentiator of the Avaya Cloud Networking Platform is that it also supports the management of wired switches. It offers a unified, powerful solution for deploying and managing both your wired and wireless network with complete control and visibility anywhere, anytime.

\*Support for Avaya Switches planned 1H 2017.



## Summary

Cloud computing and SaaS are rapidly being embraced by IT organizations worldwide as benefits in operational cost, capital cost, IT agility, and infrastructure reliability are being realized by these organizations. Indeed, many organizations have shifted future IT spending to reflect a larger balance of cloud technologies vs. on-premise technologies.


Avaya recognizes the efficiencies that the cloud can bring organizations. The Avaya Cloud Networking Platform simplifies wireless and wired deployments allowing organizations to easily manage, control and secure their network anytime, anywhere. This allows them to focus on what they do best – serving their core customers and constituencies, not manage IT infrastructure.

## About Avaya

Avaya is a leading, global provider of customer and team engagement solutions and services available in a variety of flexible on-premise and cloud deployment options. Avaya's fabric-based networking solutions help simplify and accelerate the deployment of business critical applications and services. For more information, please visit [www.avaya.com](http://www.avaya.com).

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