

WHITE PAPER

# The Benefits of Wireless Infrastructure 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
- **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.

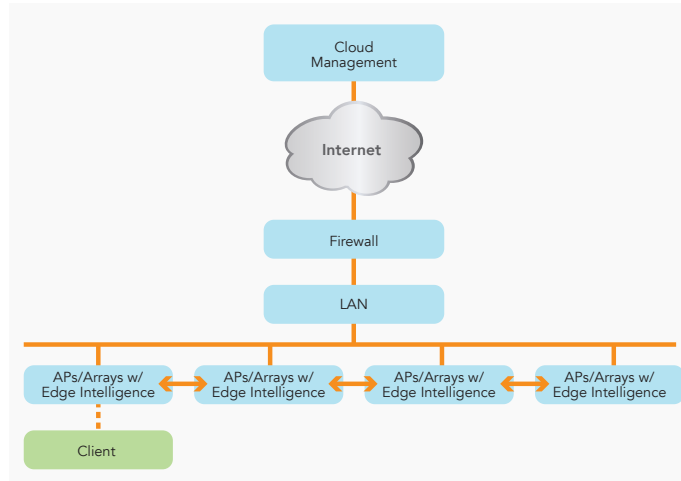
However, drawbacks to this architecture included:

- 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:
    - 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** — Tunnelling 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.

# Xirrus Architecture — Management In The Cloud

Xirrus integrates the data-path controller function into its Wireless Arrays and 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 Array/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/Array.
- No controller is needed for the traffic data plane — all wireless client traffic is presented to the LAN at the AP/Array — data need not be tunneled back to a centralized controller.

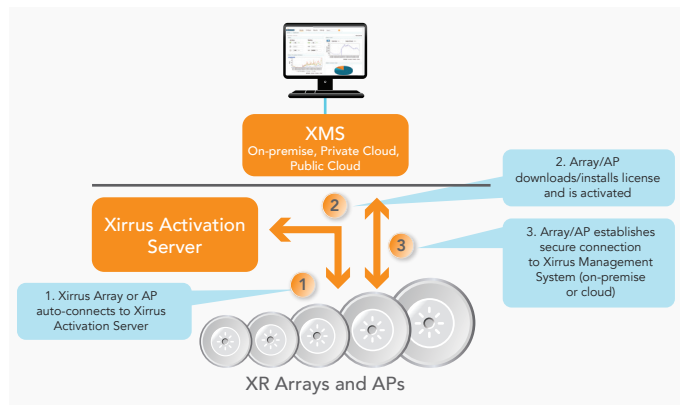


Several benefits are realized with the Xirrus approach:

- **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 Xirrus 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.
- **Secure Data Flow** — Client traffic is kept entirely on the organization's LAN as the Xirrus cloud management service only communicates management (configuration, setup, administration, and report) traffic to the APs/Arrays. The Xirrus Cloud Management System is out of band of client data.
- **Secure Management** — Control Traffic Between the APs/Arrays and the Cloud Management System 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. In addition, the data transmitted through the tunnel does not involve client data.
- **Security of the Organization's Perimeter** — The tunnels between the Xirrus Cloud Management System and the APs are initiated by the APs/Arrays and not by the Xirrus Cloud Management System, 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 Xirrus Cloud Management System, 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 Xirrus Cloud Management System 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.
- **Simplified Deployability** — The provisioning of a wireless network requires deployment of only APs/Arrays — Xirrus 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. Additional re-sizing of a controller when AP deployments grow is also eliminated.
- **Minimal IT Administration** — Because the Xirrus Cloud Management System is hosted by Xirrus, updates and upgrades to the software are completely managed by Xirrus during scheduled maintenance windows and are transparent to the organization's IT staff. Firmware upgrades of the wireless Arrays/APs under cloud management are also conducted by Xirrus, making time-intensive infrastructure maintenance a thing of the past.

# Xirrus Activation Server — Accelerated AP/Array Deployment from the Cloud

Cloud Management also accelerates the provisioning of the new APs/Arrays. Xirrus Activation Server, a cloud provisioning service that works through the Xirrus cloud management architecture, helps to drive down the effort and time required to deploy Arrays/APs:



1. Reliable, high performance Xirrus Arrays/APs with integral Application Control\* are physically deployed in your wireless LAN.
2. Xirrus devices automatically connect to Xirrus' cloud over SSL and, seamlessly via Xirrus Activation Server, register and obtain their license for operation on your network.

3. You have complete visibility and control over your entire network over the web — manage wireless SSIDs, control applications being used on your network, and run usage reports on your users with a few clicks.

## 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.

Xirrus recognizes the efficiencies that the cloud can bring organizations — these efficiencies ultimately allow them to focus on what they do best — serving their core customers and constituencies, not manage IT infrastructure.

Xirrus was founded on the premise that “wireless would replace wired as the primary choice for network access” and we continue to seek after that vision — transforming wired to wireless by providing the most powerful, scalable, and trusted wireless access solutions to organizations who increasingly depend on them for day-to-day operations.

## About Xirrus

Xirrus is the leader in high performance wireless networking. The enterprise-grade Xirrus Wi-Fi Array enables wireless connectivity for small businesses to the Fortune 500. Headquartered in Thousand Oaks, CA, Xirrus is a privately held company that designs and manufactures its family of wireless products.



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