

IIT Jammu: A Future-Ready Cognitive Campus

Highlights

- End-to-end Arista Networks' Cognitive Campus solution
- Deployed an up-and-running network in six weeks
- Reduction in network-related complaints and operational expenses
- High-availability network
- Zero-touch provisioning
- Centralized monitoring with live streaming telemetry
- Access switches that Improve WiFi network performance
- APIs that ease configuration management
- Support for upto 10K WiFi and wired clients
- All 25G Uplink scalable to 40G
- Next Generation, Vendor agnostic MLAG stack architecture
- Scalable network design to cater the institute growth.
- Edge to distribution traffic control.
- Network is ready with end to end QoS marking to prioritize voice and video traffic to provide best end user experience, additionally telemetry and analytics system can highlight the application experience of end user.

Indian Institute of Technology (IIT), Jammu is a recent entrant to India's elite club of institutions for undergraduate and postgraduate engineering education. The residential campus, covering an area of 400 acres, is designed to grow up to 12,000 students, faculty, and staff.

To meet its current and emerging Information and Communications Technology requirements, IIT Jammu chose to deploy the Arista Networks' Cognitive Campus solution.



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Challenges:

IIT Jammu started with a temporary campus in the year 2016. The campus network was makeshift in nature and the network equipment was from a mix of vendors including Arista. As the number of students grew, the network failed to scale because of the following reasons:

1. Difficulty in managing a multi-vendor network with a small IT team.
2. Insufficient port capacity, which caused a delay in the deployment of critical infrastructure such as surveillance cameras and IP phones.
3. Lack of adequate power to WiFi APs, leading to coverage and throughput challenges.
4. Blocking Architecture led to Throughput and performance related issue in core network

These challenges became all the more urgent as the move to the permanent campus drew closer. IIT Jammu was going to need a network that met current and future requirements.

The key requirements put forth by IIT Jammu were:

High-performance

- End to end non-blocking architecture
- Min 25G uplink, scalable up to 40G
- High network availability while scaling up
- Seamless WiFi roaming throughout the campus
- Up to 10K WiFi and wired clients
- Precision Time Protocol

Manageability

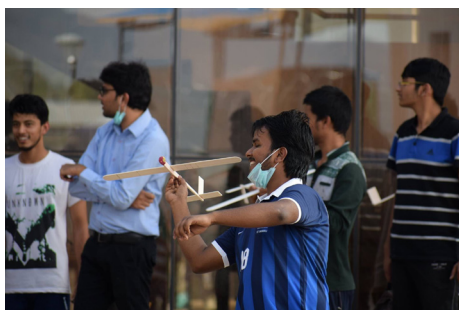
- Zero-touch provisioning
- Template-based configuration
- Centralized network monitoring
- Real-time telemetry
- QoE & QoS for different services

Automation

- APIs for configuration management
- Automatic hitless upgrades
- Event-triggered email notifications

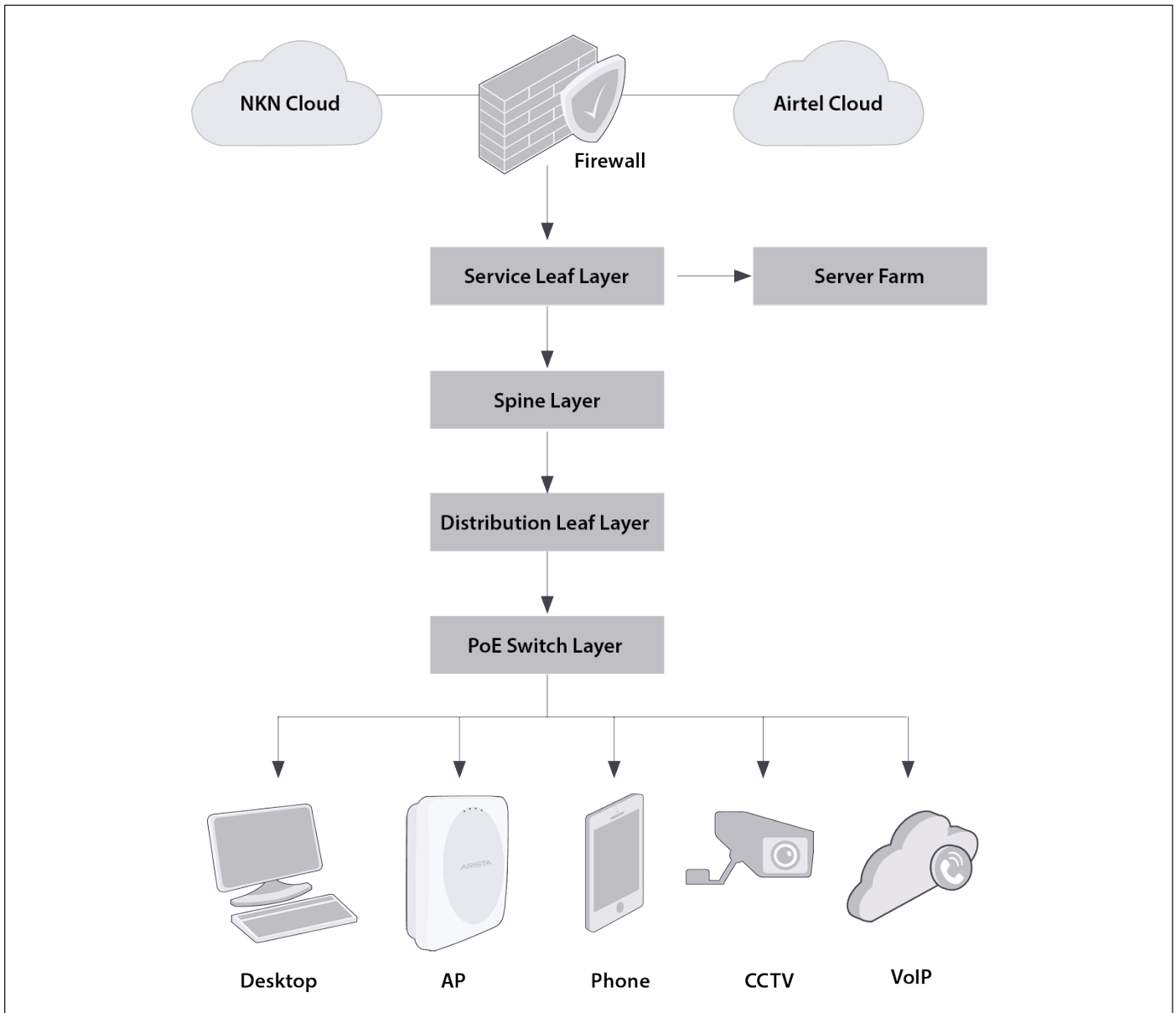
Security

- Segmented network
- NAC integration



Solution

To address the requirements described above, Arista proposed a Unified Campus Network design. The following figure shows the layers in the network architecture and the table lists the switch models used. The service leaf layer caters to network services like AAA, Web Server, DHCP, DNS, and Firewall. The service leaf layer and distribution layer are connected by VXLAN.



Layer	Device
Service Leaf Layer	7050SX3
Spine Layer	7050CX3
Distribution Leaf Layer	7050SX3
PoE Switch Layer	720XP
WiFi	C-130



Results:

With the Arista Networks' Cognitive Campus solution, IIT's network team now monitors the network with live streaming telemetry. This leads to significantly fewer network-related complaints. CloudVision Portal (CVP), Arista's network management user interface, helps network teams get critical alerts on email.

All switches send telemetry data to CVP and to the customer's network controller. The team uses the packet-level granularity offered by CVP to study and optimize the network.

CVP APIs help IIT Jammu develop new automation tools to ease their day to day activities. Arista recommended a cost-effective 25G uplink to IIT Jammu — sufficient for their current requirements. The Arista fabric supports 40G, which allows IIT Jammu to scale without any changes to the infrastructure. Existing Access layer POD and distribution network is ready to upgrade to 100G up-links in future.

The Arista access switches fulfilled the power requirements of the WiFi APs, significantly improving the campus WiFi network performance. The resulting OPEX savings and the scalable infrastructure have enabled IIT Jammu to succeed in their mission.

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