



White Paper

UC SDN Solutions

Orchestrating a brighter world

NEC

NEC's App Aware Networking delivers high quality user experience while simplifying operation challenges and reducing costs.

Business Challenge

Poor Quality of User Experience in Voice and Video

Voice and video communication are mission critical for any organization. The consolidation of Unified Communications onto data networks has provided operational benefits and expansion of applications and features.

Poor audio quality including sound artifacts, distortions or outright dropped audio can increase as these traditional separate networks consolidate. In many cases paradoxically, the network predictability declines with the upgrade to consolidated VoIP infrastructure. This can lead to overprovisioning of network capacity or re-segregation of voice and data networks, offsetting the expected benefit of consolidation.

Proliferation of applications and devices

The use of modern collaboration tools such as real time video is rising dramatically. As these applications require significantly more bandwidth and can be severely affected by changes in the condition of the network, they place new strains on the consolidated network. High quality real time video communications can consume significant bandwidth.

Additionally, the emergence of the IoT (Internet of Things) era means a proliferation of new devices. Network operators now have to cope with additional devices while maintaining current quality to existing services and applications such as Voice and UC. This consolidation however has resulted in greater variability in the end user experience.

Challenges in IT Operations

Organizations supporting these networks must translate the business and application requirements into policies that gets deployed in network. As the demands grow, managing these policies becomes increasingly difficult.

Operational challenges faced by teams supporting UC solutions include:

- **Provisioning systems** – provisioning new systems and administering add/moves/changes. Usually network experts must translate the business requirements into a device/context specific environment being deployed. Provisioning often requires routine manual configuration. Additionally, provisioning network changes in failover mode or disaster recovery phases have to be accounted for and in many times is very challenging if not often costly and impossible.
- **Applying and changing policy** – The confluence of business and regulatory changes and ever-evolving applications mean that network policy must change more than ever before. Traditional networks are not well suited to the pace of change of the current environment that are very dynamic in nature (See NEC's White Paper on some of the technical challenges of addressing these issues) while current traditional networks are very static. Example UC services include prioritizing specific voice calls (911) over others or prioritizing certain UC communications over others (VIP, Nurse Calls, Conference Calls, etc.). Despite the need to make network policy changes, the complexity and difficulty of making changes hinders/delays applying new policies. This means the consolidated network often lags the organization's requirements and can impact the quality of experience of the individual user and the organization as a whole.
- **Troubleshooting** – the complexity of the underlying products and protocols supporting consolidated networks make it difficult to identify and remediate service issues. Simply measuring latency, packet loss and jitter is not enough.

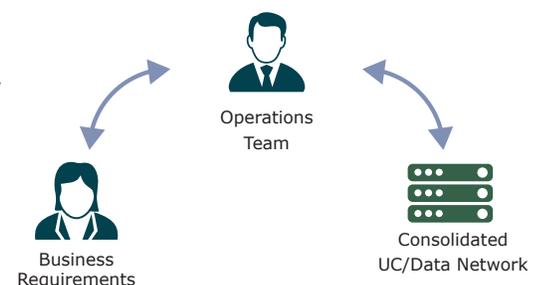


Figure 1 - Traditional Network Operations



Introducing App Aware Networking

The NEC App Aware Network addresses these business challenges. With App Aware Networking, a consolidated network combines the awareness of the user experience with network programmability to deliver address both end user experience issues while liberating the operations team from the traditional challenges to deliver these services.

NEC leverages innovations in software defined networking (SDN) and advanced Unified Communication to deliver benefits to both the UC consumer and the operations team. The component of the solution are as follows:

- **ProgrammableFlow Software Defined Network Controller** – An SDN controller that centralizes network control providing easy network provisioning, simplified policy management, and network visibility.
- **Software Defined Switching** – network switching from NEC and other vendors that support open networking protocols (a complete list can be found on NEC’s website).
- **NEC Univerge Unified Communication** – NEC’s UNIVERGE UC Solutions provides information on the quality of user experience across many UC applications.
- **UC/SDN Adaptor** - a policy management application that sits between Unified Communication platform and the ProgrammableFlow Controller orchestrating policy and priorities set by the administrator.

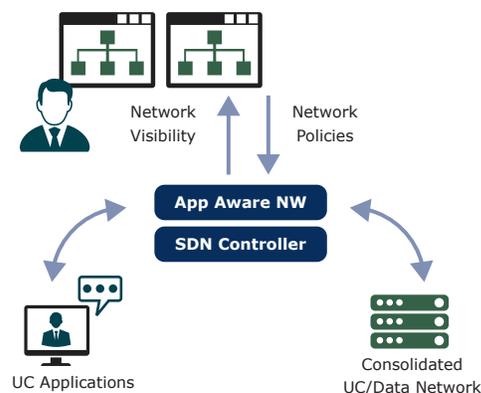


Figure 2 - Network Operations with App Aware Networking

App Aware Networking uniquely orchestrates the interaction and communication between Call Control and Network Control. Through this coordination, the required QoE can be achieved at each stage of the call: during configuration, at the beginning/end of the call (Dynamic QoS), during the call (call quality monitoring).

Operating App Aware Networking

App Aware Architecture fundamentally changes the operation model of a consolidated UC/Data Network. Unlike traditional networks where each element needs to be uniquely configured and managed, network controller model centralizes network policy and management. Centralizing control of the network enables dynamic changes to services and network policy. This both simplifies the job of the operations team and provides a framework for the integration of application service requirements into the network while providing a more efficient way of utilizing network resources

NEC’s ProgrammableFlow Controller implements an organization’s policies and priorities within a network continuously in real time. The operations team inputs the policy and priorities of the organization in an easy to operate management console. The SDN Adaptor collects information on quality of experience from the UC and uses the programmability of the network to change network service dynamically.

By combining awareness from the application with dynamic changes in the network, NEC’s App Aware networking dynamically adjusts to the UC users demands, based on the policy set by the administrator:

- Prioritization for voice and video versus other type of data
- Prioritization of important calls versus less important calls
- Call quality monitoring across both at LAN level (SD-LAN) and over the WAN (SD-WAN)

This new architecture enables the network to become more agile. By combining real time feedback of user experience from NEC’s UC platforms with dynamic network control, the network reflexively responds to the continuous needs of users.

Business Impact

- Implementing NEC App Aware networking can benefit the organizations users, operators and reduced capital costs.
- User impact – quality of user experience is improved because the network can now respond immediately to quality of service requirements or issues that arise
- Operations Team – App Aware networking delivers a single interface for managing the network policies. Eliminating device level configurations, reduces much of day-to-day configuration changes. NEC has estimated that +80% of manual configuration of networks can be eliminated by deploying an App Aware Network Architecture. Moreover, the greater visibility gained from an Open SDN Architecture means speedy troubleshooting.
- Reduced Capital Costs – by introducing the NEC App Aware Networking, the organization can provide flexibility and service agility lacking in traditional networks, reducing the need for overprovisioning. Network services can be consolidated into a common infrastructure, which means the cost of purchase and maintenance of redundant systems can be eliminated.

Corporate Headquarters (Japan)
NEC Corporation
nec.com

North America (USA & Canada)
NEC Corporation of America
necam.com

NEC Enterprise Solutions
NEC Europe Ltd
nec-enterprise.com

APAC
NEC Asia Pacific Pte Ltd
sg.nec.com

Latin America
NEC Latin America
lasc.necam.com

About NEC Corporation of America: Headquartered in Irving, Texas, NEC Corporation of America is a leading technology integrator providing solutions that improve the way people work and communicate. NEC delivers integrated Solutions for Society that are aligned with our customers' priorities to create new value for people, businesses and society, with a special focus on safety, security and efficiency. We deliver one of the industry's strongest and most innovative portfolios of communications, analytics, security, biometrics and technology solutions that unleash customers' productivity potential. Through these solutions, NEC combines its best-in-class solutions and technology, and leverages a robust partner ecosystem to solve today's most complex business problems. NEC Corporation of America is a wholly-owned subsidiary of NEC Corporation, a global technology leader with a presence in 160 countries and \$28 billion in revenues. For more information, visit necam.com.