

Managing IPv6 Deployment and Co-existence

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A new generation of service and IP management solutions — enhances availability, quality and security

The complexities associated with managing the deployment of next generation service offering requires innovative approaches for end-to-end device configuration, iron-clad access security, flexible policy management and an integrated approach to service quality assurance. Additionally, fast, secure and reliable management of IP addresses, services and end-users, are critical.

The imminent exhaustion of IP (IPv4) address, advanced requirements for next generation services, and security concerns are also prompting a move to the next generation of the Internet Protocol, IPv6. In addition to the greatly expanded address space, technical benefits of IPv6 include performance improvements, better security and enhanced support for mobility.

However, complexities associated with the adoption of IPv6 raise significant network planning, operations, and management concerns. Numerous technical differences between IPv4 and IPv6 mean that even seasoned IP professionals will face significant network allocation and usability concerns when they introduce IPv6 into their infrastructures. The impact of poorly managed IPv6 address space, which includes allocation errors and poor capacity planning, can potentially have severe consequences. Most experts do agree that IPv4 and IPv6 will certainly coexist for many years or decades to come, resulting in the need to maintain dual inventories, one for IPv4 and one for IPv6. Ultimately, the need for a tool that will abstract the complexities of the technology and reduce risks is paramount.

Managing the Transition to IPv6

Lucent Technologies is uniquely positioned to help operators centrally manage both IPv4 and IPv6 addresses and Domain Name Services (DNS). Lucent Technologies' next generation, multi-platform solutions and high-performance network servers (DNS, DHCP) modularly address the ever-growing IP management needs of next generation networks and services.

Facilitating IP Address Acquisition and Allocation

The first step in successfully implementing IPv6 is the acquisition of IPv6 address space from an Internet Registry such as ARIN (American Registry for Internet Numbers), APNIC (Asia Pacific Network Information Centre), RIPE NCC (Réseaux IP Européens), LACNIC (Latin-American and Caribbean IP Address Registry), or AfriNIC (African Internet Numbers Registry). The process of further subdividing address space must then be carefully performed, considering popular address allocation methodologies and best practices. Software tools such as VitalQIP® facilitate orderly address distribution ensuring the greatest amount of flexibility and efficient IP utilization. Lucent Technologies' management solutions simplify the application of many of the standards, rules, and recommendations that reduce allocation waste, address tracking and reporting requirements, and enforce best practices. Equally as important is the ability to determine address utilization in an instant, facilitate address assignment, and maintain accountability. Robust IP address management features like those offered in Lucent Technologies' VitalQIP® IP Address Management software assist in securing and streamlining the IP address acquisition, allocation, and management processes.

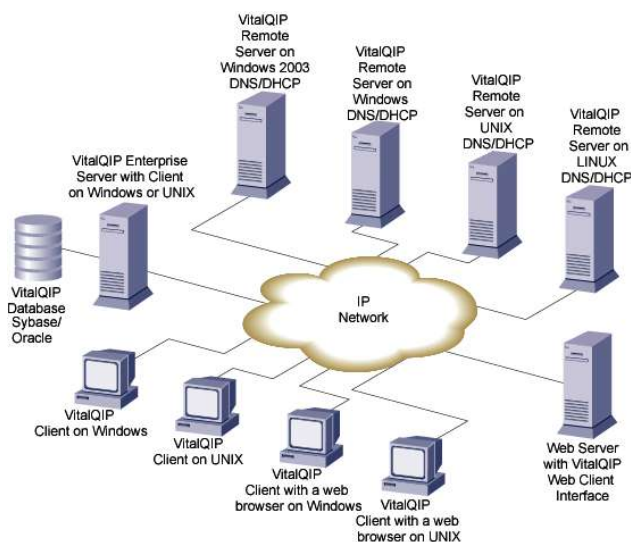


Figure 1 A modular approach to managing IP Addresses and associated services

Easing IP Address Deployment

IP and network administrators alike must consider addressing and node configuration deployment strategies that will yield the appropriate levels of automation, flexibility, and control. IPv6 deployments will typically utilize one or more address types including unicast, multicast, and anycast, as defined by RFC 2373. Address assignment and node configuration choices include static, stateful DHCPv6, stateless DHCPv6, and stateless auto-configuration must also promote error-free, efficient deployments.

Advanced implementation of converged, next generation services demand evaluation and dynamic policy setting of IP addresses and configuration options often based on pre-defined criteria. Flexible policy tools and open APIs simplify deployment through automated rules-based address allocation, renumbering and other complex operational tasks.

Centralizing Management

Centralized management and monitoring of critical network services (DNS, DHCP, TFTP, ENUM, and others) simplifies administration, masks underlying complexities, eases deployment, and promotes maximum availability. For all but the smallest IPv6 environments, the management of DNS servers, zones (forward and reverse), resource records and other complex configuration parameters must be straightforward. Implementing a high-reliability, redundant DNS solution is even more critical with IPv6, given the complex new format and variety of address types.

To capitalize on the benefits that DHCPv6 offers, centralized management is also essential. DHCPv6 management should provide the ability to configure a server for stateful, stateless, or both modes simultaneously, while preventing the inadvertent use of overlapping address pools and duplicate assignments. A properly managed DHCPv6 implementation can also be used to determine the accurate state of address utilization, as well as manage relationships among DHCPv6 servers. Scaling to millions of addresses and deployed today at the world's largest mobile and fixed providers, VitalQIP® software reliably powers always-on services, while reducing operating costs through centralized management.

Monitoring and Auditing to Enhance Security

Security and regulatory requirements compel enterprises and service providers alike to monitor and audit network access for both IPv4 and IPv6. This is most notable in broadband environments. The ability to determine the differences between the current and last known state of a network is instrumental in detecting and confronting network irregularities including unauthorized access. Moreover, the stateless auto-configuration feature of IPv6 opens the possibility of undetected and unauthorized network access which can be mitigated by IP address software that can discover and audit IP networks, determine network utilization, perform network accounting and ultimately increase network-wide security.

Integrating Service Management

Network management and operations will both benefit from a centralized repository of IPv4 and IPv6 network data, where all address spaces and services are managed by a single solution. The use of transition technologies (dual-stack, tunnels, etc.) will be used to introduce IPv6 into existing network infrastructures promoting the evolution of IP networks. VitalQIP® software automates and simplifies co-existing IPv4 and IPv6 network management in an integrated fashion helping to increase reliability and availability for next generation IP based services.

Managing User Access to Services

From a services perspective, security begins with identifying and allowing access to services based on end-user credentials. From network login, through accessing a multitude of next generation applications and services, fully centralized Authentication, Authorization and Accounting (AAA) to identify and control users is absolutely critical. Lucent Technologies' *NavisRadius*™ AAA server software, Network Computing Magazine's 2005 Security Product of the Year and Authentication Server award winner provides centralized, secure authentication for a wide range of access means including 3G mobile, Wi-Fi, WiMAX, and DSL, permitting users to seamlessly roam in a barrier free manner increasing usage and loyalty. Designed for the needs of large providers and global enterprises using the most demanding network login applications, its progressive protocol features such as EAP-SIM, Diameter protocol support, and advanced certificate support, coupled with its powerful policy management capabilities, allow providers to rapidly deploy secure multi-media and blended lifestyle services, based on time of day or other predetermined criteria.

Lucent Technologies VitalSuite® Network and Service Management Software

Lucent Technologies, a proven global provider of multi-vendor, multi-technology software, provides market leading integrated OSS management solutions that deliver the complex services that drive next generation communications. Lucent Technologies' award-winning VitalSuite® Network and Service Management software portfolio is used today by more than 1,800 Service Provider, Government and Enterprise customers worldwide for service quality assurance, traffic management, IP address management and authentication management. Lucent VitalQIP® IP Address Management software, the Network World 2005 Clear-Choice award winner and Lucent *NavisRadius*™, Network Computing Security Product of the Year award winner, are both market-leading, best-in-class solutions.

Lucent leverages patented innovations from Bell Labs and insights from Lucent Worldwide Services to provide highly flexible, scalable solutions that enable converged services, enhance the user experience and accelerate time to revenue. Lucent partners with world-class system integrators, complementary ISVs and hardware vendors to deliver end-to-end solutions that reduce operational complexities, ease integration costs and maximize profitability.

For more information on Lucent Technologies VitalSuite® Network and Service Management software, please visit: www.lucent.com/vital

