

Carriers Speak: Inside Tips for IPv6 Services

IPv6 has been on the minds of service providers for years. Is the industry finally ready for it? We asked IPv6 leaders AT&T, NTT, Qwest and Verizon to candidly evaluate the preparedness.

By David Greenfield

Enterprises are slowly starting to get their hands around IPv6 and what it means for their organizations, but service providers have been thinking IPv6 for years now. And what should a service provider be talking about when it comes to IPv6? We went to the beast itself and had four IPv6 leaders—AT&T, NTT, Qwest and Verizon—grade their own industry about the Dos and Don'ts of IPv6.

Carriers weren't asked to assign simple number grades or pass/fails to their own or their industry's IPv6 preparedness. Carrier services are too complicated for that. However, they were candid about their industry and its successes and concerns around IPv6. The biggest concern? Business value. The lack of a clear business case for IPv6 services right now means some are trying to deliver IPv6 at just the right time. "Since IPv6 doesn't generate new revenue today, we're trying to arrive at IPv6 capability at exhaustion," says Kelly Brown, manager of global Internet dedicated service product marketing at Verizon.

The carriers were also wary about the sophistication of their peers in dealing with IPv6. "I would look at how in-depth have the carriers converted their infrastructure," says Bob Schroeder, Qwest director of product management regarding IPv6. "Not everyone has converted [their back-office and management systems] to support IPv6 and some fairly old technology still exists."

We started by asking the carriers about the types of IPv6 services that are available today. All of the vendors talked about their dual stack architectures, meaning that they can deliver a single line that supports IPv4 or IPv6 addressing simultaneously depending on customer requirements. Dual stack was generally considered to be the most feasible, realistic approach in the near future for the transition to IPv6 services.

However, some instances will be best served through a IPv6 tunnel. Prime examples are particularly in test cases where enterprises want to start experimenting with IPv6—something that all of the vendors encouraged. The problem of tunnels, though, is that they're subject to the performance of the underlying IPv4 networks, a network where the IPv6 ad-

ministrators might not have visibility into on a given route. As for pure IPv6 services, they're mainly used for labs or testing, and most want to access to the IPv4 content.

The conversations quickly turned to how service providers would evaluate themselves. "I would ask if they've received their own STLA (Sub Top Level Aggregation) allocation from ARIN," says Cody Christman, director of product engineering at NTT. STLAs are IPv6 addresses meant for service providers to allocate to their customers. STLA allocation can be confirmed with the various registries.

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Allocating IPv6 addresses is penny stakes for getting into the game. Enterprises should be looking at the extent of the support services they offer around those IPv6 allocations. How compatible are the rest of their IP protocols with IPv6? Case in point is DNS. NTT's Christman asks: Do their DNS services support IPv6 Record types like quad A records, and are those records supported over a dual stack transport?

The management and reporting platform should also be IPv6 capable. "You'll want to see how networks perform," Christman says. "Do they offer SLA for IPv4 /IPv6 and provide reporting metrics like packet loss, availability, jitter on the IPv6 network? Generally, IPv4/IPv6 traffic will be routed over the same path, but not always. A IPv6 Looking Glass [NTT's management and reporting platform] will keep you informed as to how your traffic is performing."

Make sure the service provider's edge will be multi-tiered. The service provider edge isn't just about accepting routed IPv4 or IPv6 traffic. It needs to support a variety of types of connections, such as VPNs, real-time audio and video and more. The

service providers should offer an edge that can support a variety of connections. AT&T, for example, has VPN concentrators on its IPv6 network enabling laptop user to continue working over IPv6, says Brooks Fitzsimmons, assistant vice president of the IPv6 product transition team.

In general, enterprises should be looking for service parity between the provider's IPv4 and IPv6 offerings. Such parity is far from guaranteed. Application services, such as managed firewalls, require close attention, but then so do things like back-office systems as they can affect the ordering and management processes of the services provider.

"All of your systems that store an IP address or talk over IPv4 need to be upgraded," says Verizon's Jason Schiller, senior Internet network engineer. "A database that was used to store IPv4 address records which were only 32-bit values now needs to store a 128-bit value. If you want to store a record as a decimal number, for example, the Oracle unsigned integer is not big enough to store the number, so instead you must do interesting things such as use dual-decimal numbers. All of this can complicate address ordering and assignment.

For perhaps the first time in years, we're seeing a genuine move toward adoption of IPv6. It's still early days (as opposed to pre-mature days), but questions are finally being asked and businesses are looking at who can bring them IPv6 connectivity. Yet, while IPv6 in carrier services may be gradually rolled out, within the enterprise it's taking even longer with more pitfalls.