

# IPv6-ready with Cisco

Move seamlessly between wireless networks and access voice and data services anywhere in the world from a handheld device. Communicate securely and consistently across your organization via voice and video to every employee's PC. Conduct business communication and transactions in real time by correlating data across clusters of interconnected networks, devices, and sensors, regardless of location. With next-generation IPv6 technology your organization can use these capabilities to achieve greater agility and create new services. Cisco can help you transition to a more efficient IPv6 architecture with proven technology, support, and global expertise. Isn't it time you laid the groundwork for tomorrow's business models?

## What is IPv6?

Internet Protocol version 6 (IPv6) is a new IP address standard replacing today's IPv4. It's designed to enable an improved global Internet architecture with enough unique IP addresses for future growth.

While both standards will coexist for some time to come, widespread transition to IPv6 is expected to occur between 2010 and 2016. Governments in Europe and Asia are accelerating IPv6 adoption to get an edge in IT innovation. US government networks must be IPv6-ready by June 30, 2008. Clearly, to remain competitive, grow, and manage risk, all organizations need to carefully manage migration to IPv6.

## IPv6: here and now

Right now transition strategies are in place worldwide. IPv6 has been successfully tested in many corporations and academic networks. Large broadband and mobile Service Providers are already leading the integration of IPv6 in their IP Next-Generation Network deployments.

The US Department of Defense has also recognized the potential of IPv6 to deliver network ubiquity, mobility and security that IPv4 cannot provide. Its IT purchases have all been IPv6-compliant since 2003 and Cisco has assisted with successful hardware and software interoperability tests on its extensive IP-distributed test and demonstration networks.

## Benefits

IPv6 introduces more consistent and transparent network addressing rules, laying the foundation for networks of much greater scale and power than ever before – and a whole new generation of innovative services and applications.

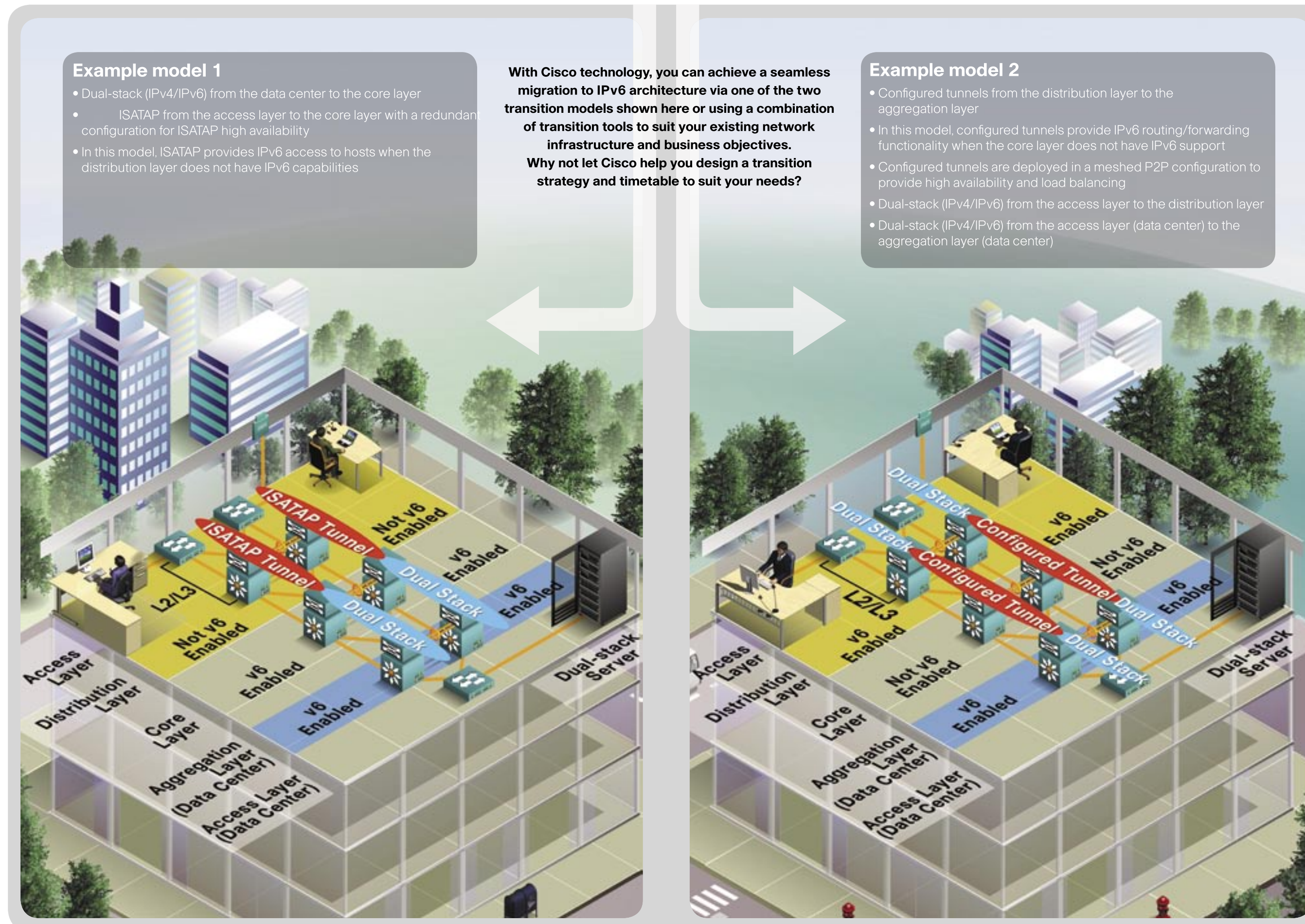
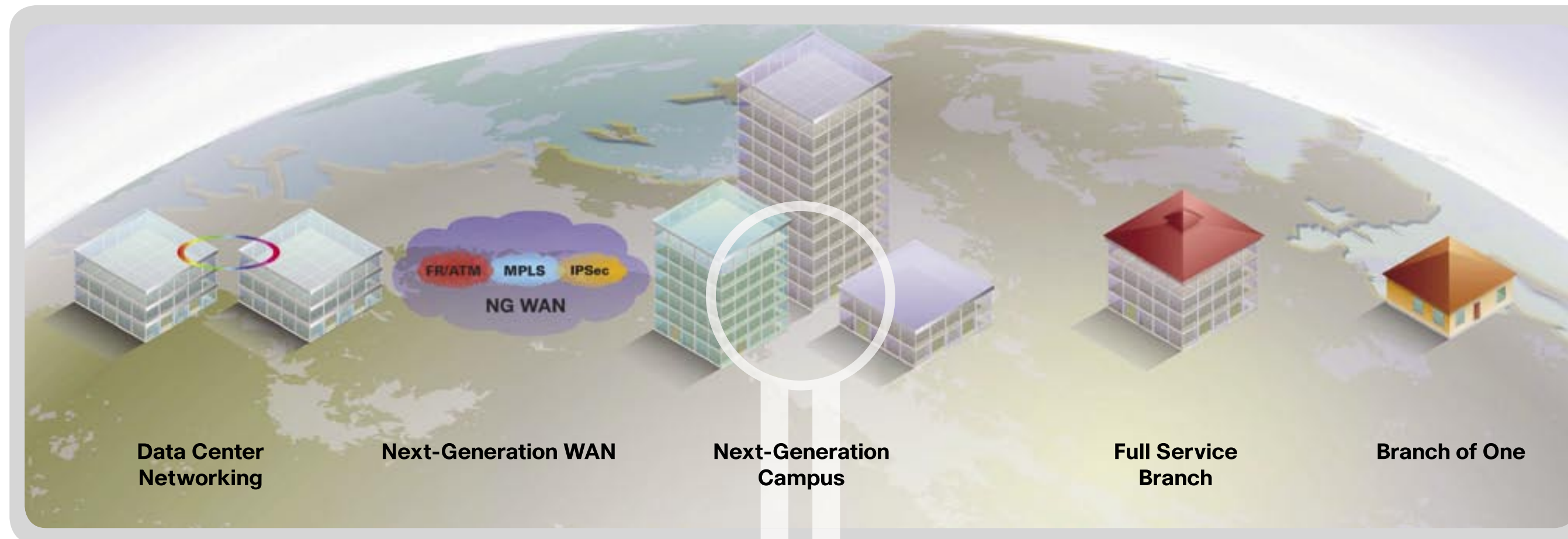
New features, such as streamlined packet structure, will provide routing and overall network efficiencies. Auto address and prefix renumbering simplify new network deployments and IP changes. And global addressing greatly enhances the scale and deployment of mobile IP and provides improved application delivery for mobile computing and multicasting.

## Transition planning tips

IPv6 transition is no longer a question of if, but when, and it takes careful planning to understand the impact it may have on your business productivity and continuity. To mitigate risks and minimize disruption, it's critical to build transition and implementation planning into your IT strategy now.

### 1. Prepare inventory & risk assessment

- Evaluate your existing network infrastructure for upgradability, making it a priority to take inventory of all hardware that cannot be upgraded to IPv6.
- Assess desktop devices for IPv6 capability. Approximately a third of today's deployed desktop systems are IPv6 capable. The rest will need to be.
- Investigate whether you need to upgrade organization-wide applications.



### Example model 1

- Dual-stack (IPv4/IPv6) from the data center to the core layer
- ISATAP from the access layer to the core layer with a redundant configuration for ISATAP high availability
- In this model, ISATAP provides IPv6 access to hosts when the distribution layer does not have IPv6 capabilities

With Cisco technology, you can achieve a seamless migration to IPv6 architecture via one of the two transition models shown here or using a combination of transition tools to suit your existing network infrastructure and business objectives. Why not let Cisco help you design a transition strategy and timetable to suit your needs?

### Example model 2

- Configured tunnels from the distribution layer to the aggregation layer
- In this model, configured tunnels provide IPv6 routing/forwarding functionality when the core layer does not have IPv6 support
- Configured tunnels are deployed in a meshed P2P configuration to provide high availability and load balancing
- Dual-stack (IPv4/IPv6) from the access layer to the distribution layer
- Dual-stack (IPv4/IPv6) from the access layer (data center) to the aggregation layer (data center)

### 2. Create a business case for transition

- You can reduce projected costs and simplify your business case by building some IPv6 transition activities into your existing IT strategy and budget. Specifying IPv6 support for any product replacements already budgeted for will reduce capital expenditure. You can also integrate IPv6 training costs, which are likely to be substantial, into your training budget now.

### 3. Establish network design strategy & objectives

- Plan to support IPv4 and IPv6 across all devices and applications, as both will coexist for the foreseeable future.
- Understand the impact of various transition technologies, including dual-stack, tunneling, and translation. While a dual-stack approach is recommended, you can use other methods singly or together to meet short- or long-term design goals and business objectives. Cisco is committed to providing a wide range of transition mechanisms to suit all types of organizational needs and challenges.
- You can use IPv6-in-IPv4 tunneling to integrate ageing equipment until it reaches the end of its scheduled lifecycle. Tunneling involves routing IPv6 packets over virtual paths in the backbone by encapsulating them in IPv4 network address headers. The IPv6 packets are delivered intact to end points, making the network appear as an IPv6 service. Tunneling also facilitates long-term goals, such as unfunded infrastructure, and minimizes the need for short-term reprogramming while maximizing your existing investment.

### 4. Determine IPv6 costs

- Most modern hardware, including routers, servers, and clients, can be simply upgraded to support IPv6 via software update. Identify devices that can't be upgraded and assess the cost of replacing them. The rest can be upgraded in routine life cycle replacement. (Note: Dual-stack systems use more memory and processing power – make sure you plan for these costs.)
- The latest releases of most commercial off-the-shelf applications, such as Windows Vista, already support IPv6. However, you'll need to investigate the cost of building IPv6 support into any custom applications you deploy.
- Estimate the cost to train staff to install, operate, and maintain IPv6 hardware and software.
- Make sure you understand the operational costs of supporting multiple IP environments during transition.

### 5. Identify timelines & transition methods

Create a comprehensive IPv6 transition plan scheduling and identifying milestones for: inventory and risk assessment; business case development and funding; training; network strategy and objectives; design testing; deployment and production.

## Let Cisco show you how

Cisco offers expert advice and services to help you prepare and manage your transition to IPv6. Our engineers work with you to assess the implications of IPv6 for your environment, including product compliance, address provisioning and management, routing policies, security, and infrastructure design. We can analyze your architecture requirements from business, technical, and implementation perspectives. Services include site survey, logical network design, physical network design, documentation, and creation of an acceptance test plan – all backed up with proven, written procedures and coaching. With Cisco on site, you'll achieve your network migration goals without costly delays, redesign or disruptions.

To discuss what IPv6 means for your organization or arrange a detailed assessment of your network readiness, contact your Cisco representative. To receive information updates, simply register at our website.

For white papers, case studies and data sheets on IPv6, visit our website. <http://www.cisco.com/ipv6>