

# ALCATEL 7420

*Edge Services Router*



ARCHITECTS OF AN INTERNET WORLD

Alcatel builds next generation networks, delivering integrated end-to-end voice and data networking solutions to established and new carriers, as well as enterprises and consumers worldwide. With 130,000 employees and sales of EURO 31 billion in 2000, Alcatel operates in more than 130 countries.

For more information, visit Alcatel on the Internet: <http://www.alcatel.com>

# Alcatel 7420 Edge Services Router

- ▼ **An intelligent, scalable, next generation, carrier grade platform for business-class IP services**
- ▼ **Designed to help Internet service providers respond to new, unique service demands and stay a step ahead of competitors**
- ▼ **Enables ISPs to increase revenues while helping them gain and retain subscribers, and reduce costs**

## The Challenge for ISPs

As your business customers turn to real-time transactions and network-based, business-critical applications, their business practices grow increasingly IP-centric. To add and hold market share, you need to offer new, tailored services.

Edge services routers are the enabler. They aggregate IP subscribers while performing advanced traffic management, to provide value-added services.

The challenge is to find the right edge services router — one you and your customers can rely on to seize maximum advantage from business opportunities today and tomorrow.



# An Intelligent Solution

**An intelligent solution doesn't end with best effort services. It offers wire-speed forwarding, no matter how complex the subscriber policy.**

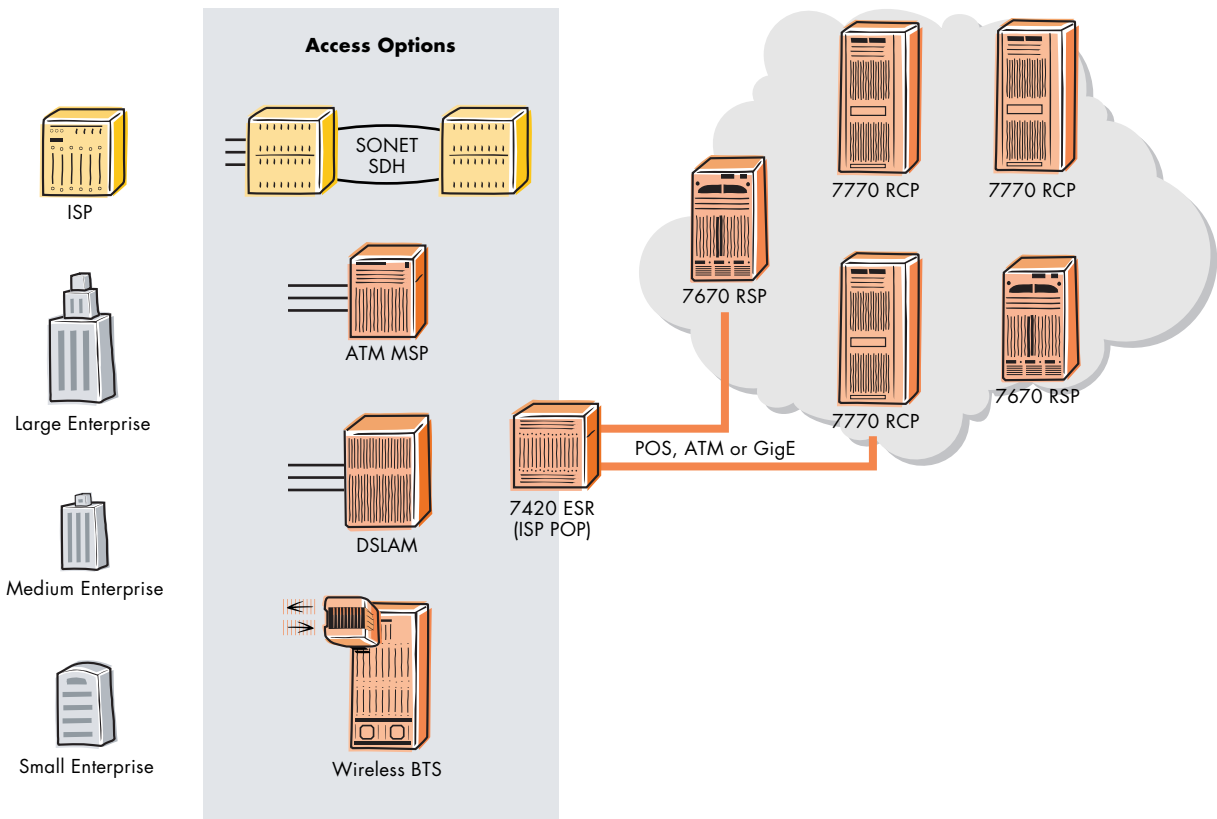
Scalable, the 7420 Edge Services Router (ESR) offers carrier grade density. Reliable, it offers complete redundancy. Then it adds features that enable benefits such as simple and effective management.

Most importantly, this intelligent solution enables linear performance growth without bottlenecks, plus it offers flexibility and adaptability, to support new services, evolving standards and diverse access options.

## Unique Architecture

The quest for performance and flexibility led us to a unique architecture, based on distributed network processors, that shares workload and separates router control and data planes.

▼ Figure 1: The 7420 ESR offers many access options



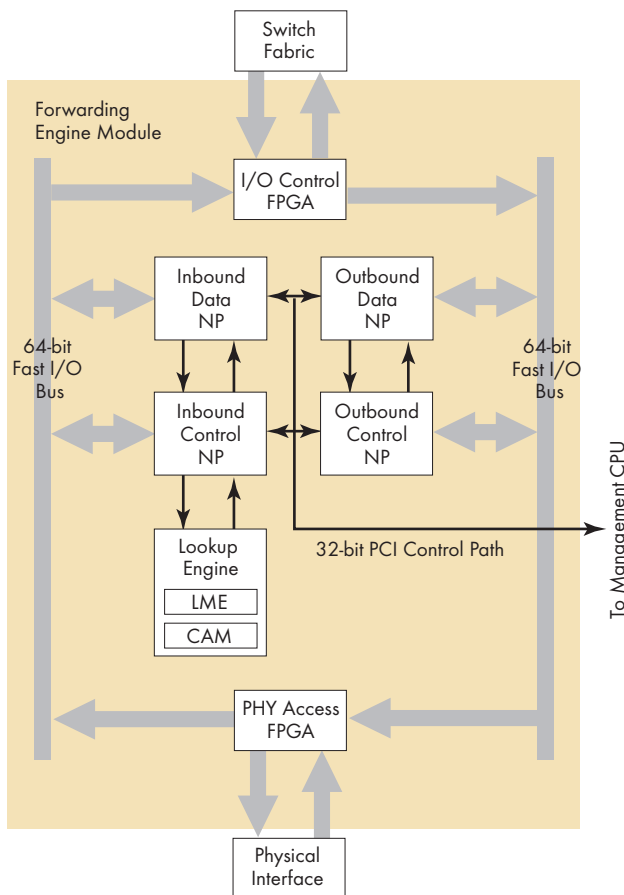


The distributed network processor architecture provides the high performance of a dedicated ASIC-based architecture with the flexibility of a software-based architecture. It enables the 7420 ESR to deliver new services in

a timely, flexible and scalable fashion, at lower ownership costs. As illustrated in Figure 2, each I/O module has a dedicated forwarding engine that forwards, filters, classifies, queues, polices and generates statistics.

A pair of network processors handle in-bound processing, another pair, out-bound processing. This provides tremendous capacity.

▼ Figure 2: High performance forwarding engine module architecture



### Network Processors: Optimal Edge Router Building Block

The network processor (NP) architecture effectively combines the performance advantages of an ASIC-based router with the flexibility and rapid time-to-market advantages of a software-based router.

The NP has an advantage over ordinary RISC processors in that the I/O portions of the processor are designed to meet the high bandwidth requirements of networking operations. It also has an advantage over ASIC-based routers in its ability to sit directly in the path of a high speed network interface.

This enables it to perform complex programmable deep packet classification operations, at wire-speed, that would be impractical to commit to a hardened ASIC, and impossible to accomplish with a general purpose RISC CPU.

# Internet Access

**Internet access is the most widely deployed service ISPs offer to their wholesale and retail customers. With the 7420 ESR, ISPs achieve manageability, security, high scalability and price/performance leadership. The 7420 ESR can handle explosive growth while providing new value-added services at wire-speed forwarding rates.**

## High Reliability

The 7420 ESR provides carrier grade reliability. It offers system, trunk and access redundancy, as well as control, fabric and power redundancy. With no single point of failure, hot-swappable services modules and NEBS 3 compliance, it is a true high-availability solution.

## Security

The 7420 ESR protects ISPs against denial of service attacks and lets them set up comprehensive access control lists. Enhanced edge and access security confer confidence and provide ISPs with an agreeable comfort level around-the-clock.

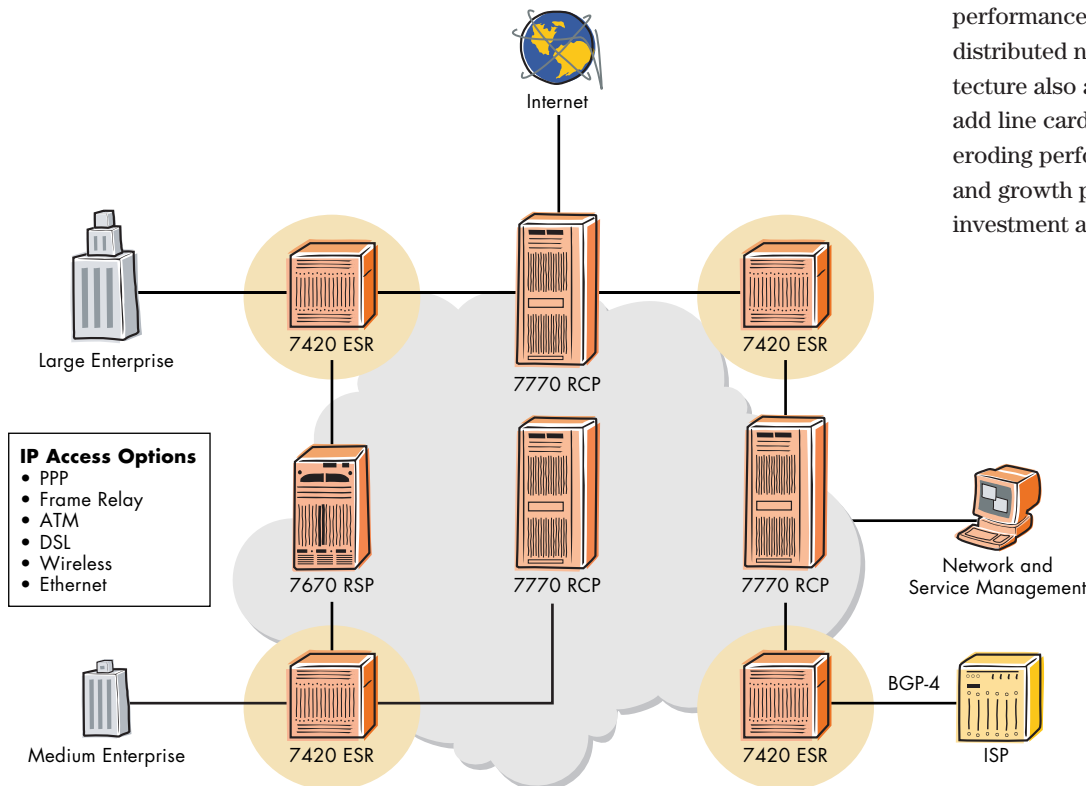
## Management

The 7420 ESR connects subscribers quickly and manages traffic with ease, thanks to its industry-leading network and service management. Adding this to Alcatel's complete traffic engineering solution, you gain optimized network use, improved performance and lower operating costs.

## Scalability and Linear Growth

The 7420 ESR scales in capacity and performance — at high density. The distributed network processor architecture also affords linear growth. You add line cards to add capacity without eroding performance. This scalability and growth potential protect your investment and future proof revenues.

▼ Figure 3: Retail and wholesale Internet access



# Business Class IP VPN Solution

**As enterprises focus on core competencies, they hire ISPs to provide intersite connectivity.**

**To take advantage of this opportunity ISPs need edge services routers offering superb intelligence, performance and reliability. Using the 7420 ESR, ISPs can offer IP VPNs, to profit from new, higher margin revenue streams.**

## Policy Application

The 7420 ESR is intelligent — and fast. Its wire-speed, parallel packet forwarding and policy application permit ISPs to tailor new, advanced IP services that leverage DiffServ, MPLS and advanced IP traffic management technologies.

Capabilities include:

- ▼ Multi-field classification, to identify users' applications
- ▼ An ability to apply complex policies without eroding performance
- ▼ An ability to map the user's application to specific classes of service

Benefits include:

- ▼ New, unique service offering capabilities
- ▼ Leadership in your market space, through the new capabilities
- ▼ New revenue streams

## Class of Service

The 7420 ESR can apply class of service (CoS) rules, to let a customer set bandwidth priorities for applications or types of transmission, such as multimedia. Customers find this a valuable resource management tool. ISPs use it to map the CoS characteristics against subscribers' throughput, performance and real-time requirements.

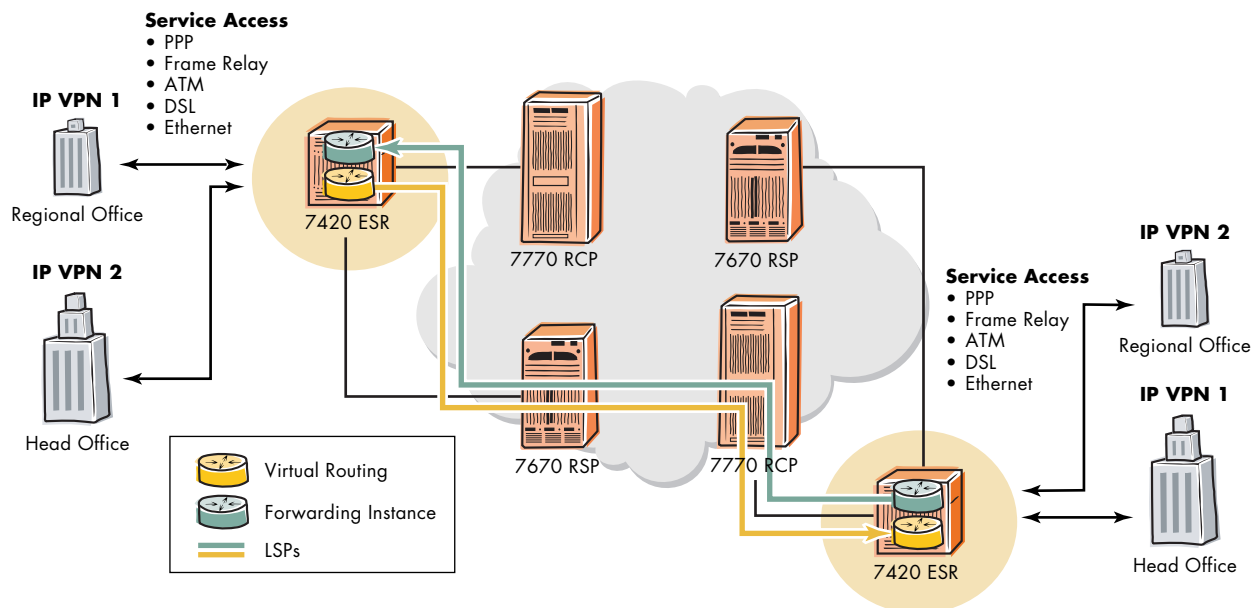
## Traffic Management

The 7420 ESR provides superb traffic management. ISPs can rely on it to police, mark and classify traffic, apply policies and queue intelligently. The 7420 ESR traffic management allows you to engineer:

- ▼ CoS, including the ability to support multimedia services
- ▼ Throughput
- ▼ Response times
- ▼ Delay variance

This degree of control, plus service availability without transmission loss enables delivery on even the most demanding SLAs.

▼ Figure 4: Business class IP VPN



# IP Aggregation

**IP aggregation lowers costs by using a single transport link for a set of services and lines.**

**With the 7420 ESR, ISPs can aggregate voice gateways, video servers and broadband access servers.**

## High Availability

Thanks to its redundancy features, the 7420 ESR offers non-stop networking. With the 7420 ESR, mission-critical applications just don't fail, no matter how complex the policy-based assignment. This crucial element, carrier-grade reliability, has been overlooked by some vendors — but not by Alcatel.

## Quality of Service

The 7420 ESR fits naturally as an aggregator of multimedia gateways offering new content services, such as video or voice, because it can handle

the full range of service classes, including real-time applications.

## Density

A 7420 ESR chassis goes in once. Scaling up doesn't require a forklift upgrade or increase the area the rack occupies. Adding capacity is as simple as adding a line card or downloading an upgrade. You gain predictable ownership costs.

## Performance

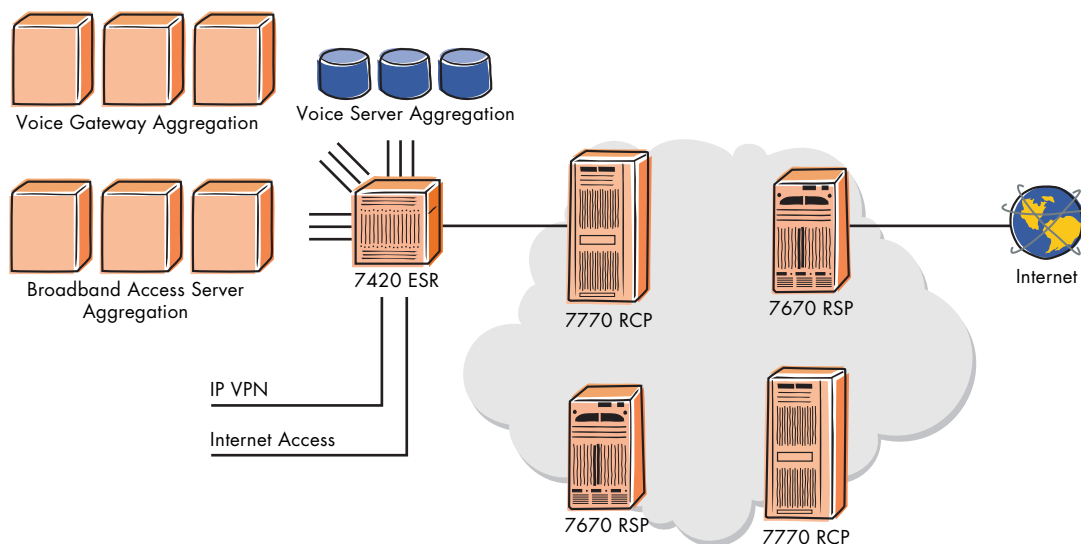
The 7420 ESR provides wire-speed parallel packet forwarding while applying even the most complex

IP policies. It forwards 18 million packets per second with latencies less than 50 microseconds and it can mark, classify, police and label traffic utilizing 48 billion instructions per second. In the 7420 ESR, intelligence matches performance.

## Linear Performance Growth

Thanks to the network processors on each I/O card, the 7420 ESR provides linear performance growth without bottlenecks. The architecture of the 7420 ESR confers the flexible, adaptable platform you need to support evolving standards and new services.

▼ Figure 5: IP aggregation

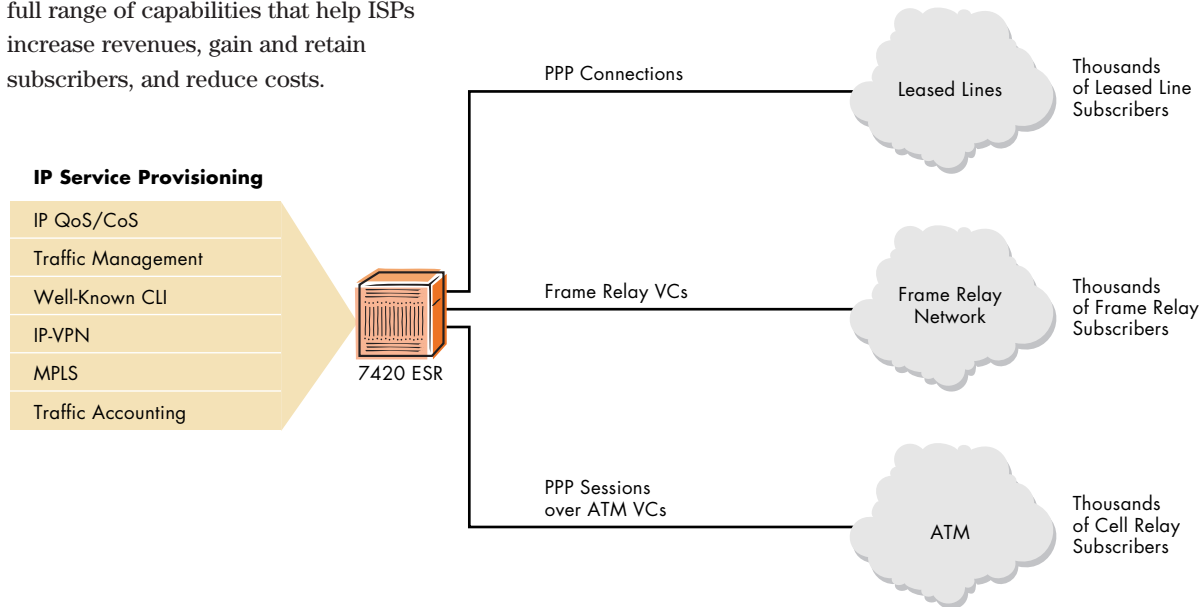


# Down to Business

**The Alcatel 7420 ESR enables ISPs to satisfy new, unique service demands and stay a step ahead of competitors.**

A next generation carrier grade platform for business-class IP services, the 7420 ESR offers a unique architecture and a full range of capabilities that help ISPs increase revenues, gain and retain subscribers, and reduce costs.

▼ Figure 6: Overview of service and access aggregation with the 7420 ESR.



Feature	Business Benefits
Advanced network traffic engineering	<ul style="list-style-type: none"> <li>▼ Unique subscriber services</li> <li>▼ High network usage</li> </ul>
Enhanced IP services	<ul style="list-style-type: none"> <li>▼ IP VPN management</li> <li>▼ Real-time sensitive voice and video</li> </ul>
Scaling in multiple dimensions	<ul style="list-style-type: none"> <li>▼ Investment protection through growth in place</li> <li>▼ High bandwidth wire-speed forwarding</li> </ul>
Advanced policy application	<ul style="list-style-type: none"> <li>▼ SLA compliance</li> <li>▼ Subscriber policy management</li> <li>▼ Tailored services</li> </ul>
High availability	<ul style="list-style-type: none"> <li>▼ Non-stop networking — crucial for revenue-generating business applications</li> </ul>
Robust IP routing	<ul style="list-style-type: none"> <li>▼ Internet-scale IP routing — BGP-4 with advanced features</li> <li>▼ High-density broadband access and subscriber aggregation</li> </ul>
Network and service management	<ul style="list-style-type: none"> <li>▼ Single step provisioning from customer to service edge</li> <li>▼ Intuitive web-based GUI with graphical view of topology</li> <li>▼ Support for configuring routers and links between routers</li> </ul>

# Complete Networking

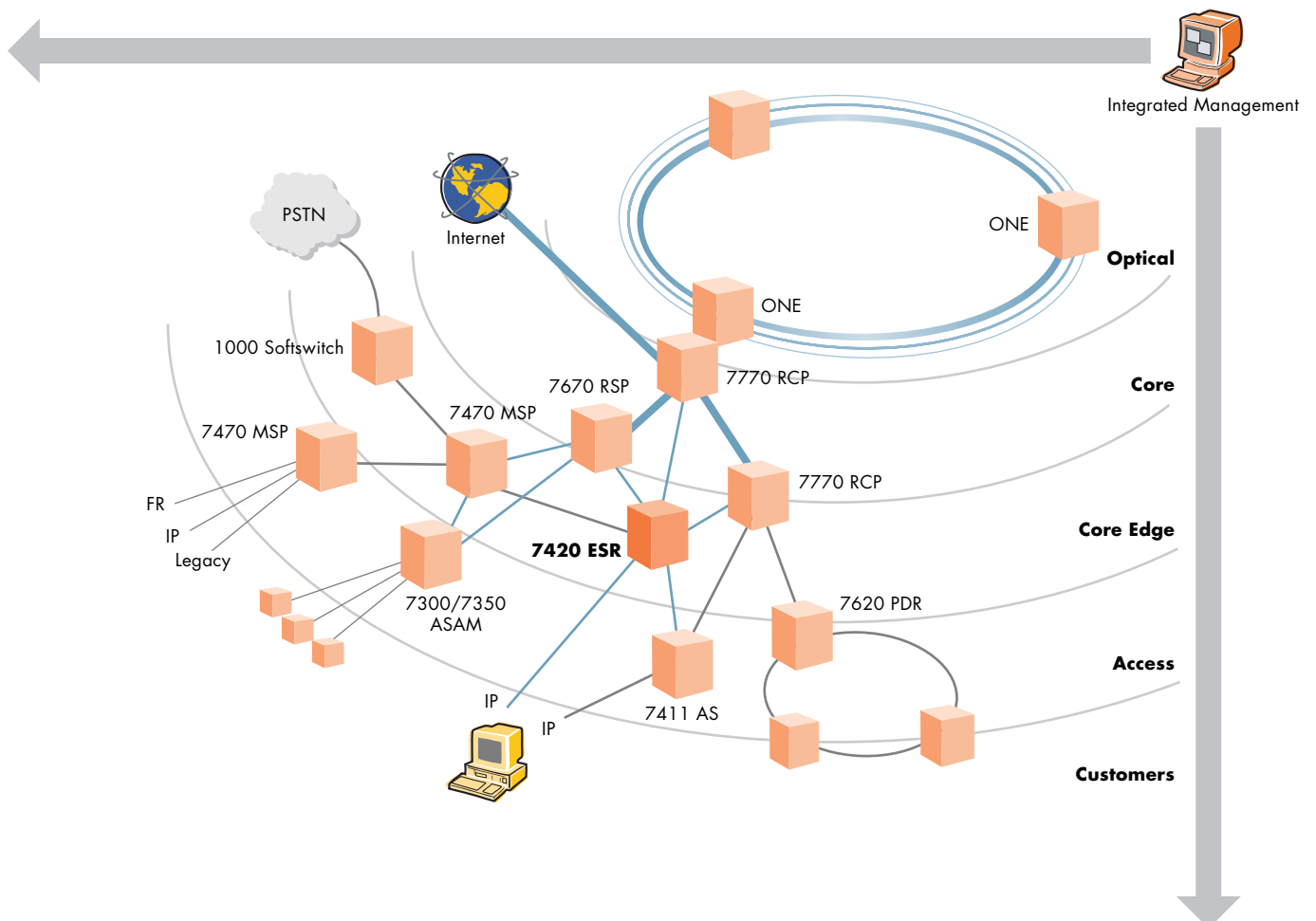
**ISPs prefer Alcatel because we know the issues — ever shorter time-to-market, speedier return on technology investment, competitive pressures — and because we provide the solutions.**

Our easy-to-use 7420 Edge Services Router enables ISPs to deliver new, unique services. Designed with an open architecture, our solutions are reliable, scalable and flexible. One package, one supplier: our products yield real infrastructure and operating savings.

The value in our product portfolio reflects years of technology leadership. We lead the world in building end-to-end, next-generation networks that integrate voice, data and IP.

Delivering reliable network solutions around the world, Alcatel offers the technology depth, breadth and experience that ISPs can rely on.

▼ Figure 7: At Alcatel, we offer more than just the box. We deliver the total package: an integrated open-architecture access network that is reliable, scalable and flexible.



[www.alcatel.com](http://www.alcatel.com)

---

Alcatel and the Alcatel logo are registered trademarks of Alcatel. All other trademarks are the property of their respective owners. Alcatel assumes no responsibility for the accuracy of the information presented, which is subject to change without notice.

© 2001 Alcatel. All rights reserved. 10839



ARCHITECTS OF AN INTERNET WORLD