IBM Networking Campus Overview Fact Sheet

Large office, small office, home office or no office—let us bring your users together

11 March 1997

Announcement Summary

Whether you're installing new LANs or WANs, moving to Frame Relay and ISDN, migrating to switching and ATM, using the Internet and intranets to leverage your investments in S/390® applications and data or consolidating separate data, voice and video networks, you can join a growing number of companies looking to IBM for dependable, high-performance, low-cost networking with global service and support. You'll find that IBM's innovative, award-winning products, coupled with IBM's business-like approach to networking, help you bring the benefits of network computing, the Internet and intranets to your users at the lowest possible cost.

IBM networking solutions, based on IBM's Switched Virtual Networking (SVN) framework, extend your network, enable your users, customers and business partners with network computing and help your company win in today's networked world. Like others, you'll find IBM an important strategic partner.

IBM networking delivers industry-leading solutions for S/390 server access, switched LANs and WANs and expanded application access for anyone from anywhere–with management applications to keep it all running smoothly and efficiently. You'll be surprised at how aggressively priced IBM's solutions are, how easy they are to install and use and how well they fit into and enhance your network.

Announcement Highlights

IBM's SVN and award-winning Multiprotocol Switched Services (MSS) offerings put switched ATM closer to today's multiprotocol workgroups:

- A new release of the MSS Server software for both the stand-alone 8210 MSS Server and the 8260 MSS Module offers Super-VLAN capability and enhanced protocol support, allowing customers to scale their ATM networks without sacrificing performance.
- FDDI connectivity with MSS allows data to be routed from FDDI to ATM networks.
- Additional features offered by the MSS Server and the MSS Module for the 8260 provide Next Hop Resolution Protocol (NHRP) support, enhanced Broadcast Management and dynamic protocol VLANs with full redundant capabilities.
- A new ATM card for the IBM 8260 Nways™ Multiprotocol Switching Hub and the IBM 8285 Nways ATM Workgroup Switch lowers the cost of 25-Mbps ATM connection.
- A Token-Ring MAC card with full RMON support for the 8260 that helps to increase network availability.
- ATM features for the 8260, including an ATM WAN module with E1/T1/J1 cards that can also be used in the 8285, and ATM 1-port 622-Mbps modules for both single-mode fiber

(SMF) and multimode fiber (MMF) help to lower the cost of connections between campus and wide-area ATM networks and provide high-capacity network backbones.

- 8260 microcode updates that include support for Private Network-to-Network Interface (PNNI-1) provide simplified, scalable VLAN networks and increased interoperability.
- A new LAN Access Switching Module and a Packet Channel/ATM Module with 155-Mbps cards for the 8260 allow increased network flexibility and ease the migration to ATM.
- A product preview for the new *Super 8260* offers an ATM-only backplane that allows four times the bandwidth and call-control capacity of the current 8260 ATM models.
- The FiberCom Circuit Emulation Module for the 8260 supports the transportation of PBX and other DS1 and E1 leased-line, high-speed traffic over an ATM backbone.

IBM's enhanced LAN switches deliver outstanding flexibility, function and performance:

- The 8276 Nways Ethernet RoutePort offers 36 ports spread across as many as 4 segments to help you economically extend the size of your switched Ethernet network. Six models allow a choice of 1 or 2 fiber ports.
- New submodules and adapter boards for the IBM 8273 Nways Ethernet RouteSwitch allow network simplification and increased capacity.
- WAN Switching Modules for the 8273, including 2- and 4-port Frame Relay Submodules, allow you to interconnect campus networks using low-cost Frame-Relay networks.
- Ethernet, Token-Ring, WAN and ATM switching modules for the IBM 8274 Nways LAN RouteSwitch allow you to simplify your network, connect to ATM networks and increase your network capacity.
- Features for the 8274 include a new Management Processor Module (MPM-1G), an FDDI Module and a Hardware Routing Engine (HRE).
- New models of the 8274 provide 5 and 9 slots (where 1 slot is utilized by the new MPM-1G Module) that are wider than the slots on the existing models, allowing them to accommodate denser modules in the future.
- We include a product preview of the RouteCell Modules for the 8274 that support 155- or 622-Mbps ATM and a Frame-to-Cell Switching Module that ease network management by giving interconnected LANs and WANs the appearance of a single network.
- FDDI Universal Feature Cards (UFCs) for the 8270 Nways LAN Switch Model 800, the 8272 Nways Token-Ring LAN Switch and the 8272 LAN Switch Module for the 8260 that save you money by lowering the costs of interconnectivity.
- RMON UFCs for the 8270, the 8272 and the 8272 Module for the 8260 that improve productivity by increasing network availability.

IBM's integrated Nways Managers offerings deliver increased productivity and automated management for more popular platforms:

- New platform support for IBM Nways Manager on Windows® NT®, with product previews for new management programs and enhanced support on existing platforms lower costs and increase network availability.
- Functional enhancements, including Frame-Relay support, for the RouteSwitch Software Program provide a better view of what's happening on your network.
- V 3.0 of the IBM Nways RouteSwitch Network Management Suite with enhancements to its network management programs and RouteSwitch software programs, new ATM Route-Cell Software and two new management programs allow advanced routing and high-speed switching.

IBM's Cable On-Line™ offerings provide very responsive access to the Internet and intranets:

- The Cable On-Line Access System delivers high-speed data services over hybrid fiber-coax (HFC) networks.

IBM's EtherJet Networking Kit simplifies and lowers the installation costs for a small Ethernet network:

- The EtherJet Networking Kit, including an IBM 8222 Ethernet Workgroup Hub and 3 IBM EtherJet 10BASE-T ISA Adapters, allow for the simple, inexpensive setup of a small Ethernet LAN.

Customer Business Solutions

Customer's business needs

The need for additional capacity, growing numbers of remote-access users, easy access to the Internet and corporate intranets and continuing interconnection and consolidation of organization networks present challenges. Network managers seek solutions that:

- Are flexible and standards-based for interoperability
- Allow them to make incremental additions where their needs are greatest
- Accommodate new applications and emerging technologies
- Incorporate switching for high capacity and remove bottlenecks

They want solutions that have immediate benefits but can be part of a longer term strategy. IBM satisfies these business needs with solutions that address network manager needs across an entire organization. In this section we discuss three customer business environments that are typical of the challenges that network managers face and show how IBM can help meet those challenges.

SVN and award-winning MSS future-proof your networks

Like many organizations, a medical school was faced with the need to reduce expenses while increasing productivity. Working with IBM they implemented an ATM network and are now graduating students with more practical experience, earlier–and using fewer instructors. Better yet they saved enough in one year to pay for the cost of their ATM network.

After reviewing available technologies, they decided to create a new modeling simulation lab in the administration building. This gave them a central location from which they could create and send simulations to students in their classrooms.

After investigation they found that their existing Ethernet network couldn't handle sending simulations to the students. IBM consultants advised them that multimedia applications require technologies like ATM because ATM can support voice, video and data simultaneously. Even converting to Fast Ethernet wouldn't solve the problem with their Ethernet network with economical justification, the IBM consultants advised.

IBM proposed a staged approach using SVN and taking advantage of IBM technologies like ATM and MSS. SVN and MSS deliver leading-edge implementations of ATM standards and combine switching, distributed routing and multi-site virtual LANs (VLANs) for step-by-step implementation of high-performance, cost-effective networks. SVN and MSS networks are excellent for demanding applications like multimedia simulation. And VLANs let them eliminate much of the administrative overhead of managing moves and changes, resulting in further savings.

IBM proposed an ATM backbone for the first step, in parallel with their FDDI campus backbone. IBM also proposed 8260 ATM switch and concentration modules and new 8285 switches. With MSS they could continue to run existing Ethernet applications and connect to the non-ATM portion of their network. For the next step IBM proposed ATM WAN connections to satellite campuses. Working with a local cable television firm, they can use IBM cable modems to also deliver many classroom benefits to remote students. Figure 1 shows the intermediate network stage and the final ATM network. The medical school now has the foundation for additional applications and cost-savings.

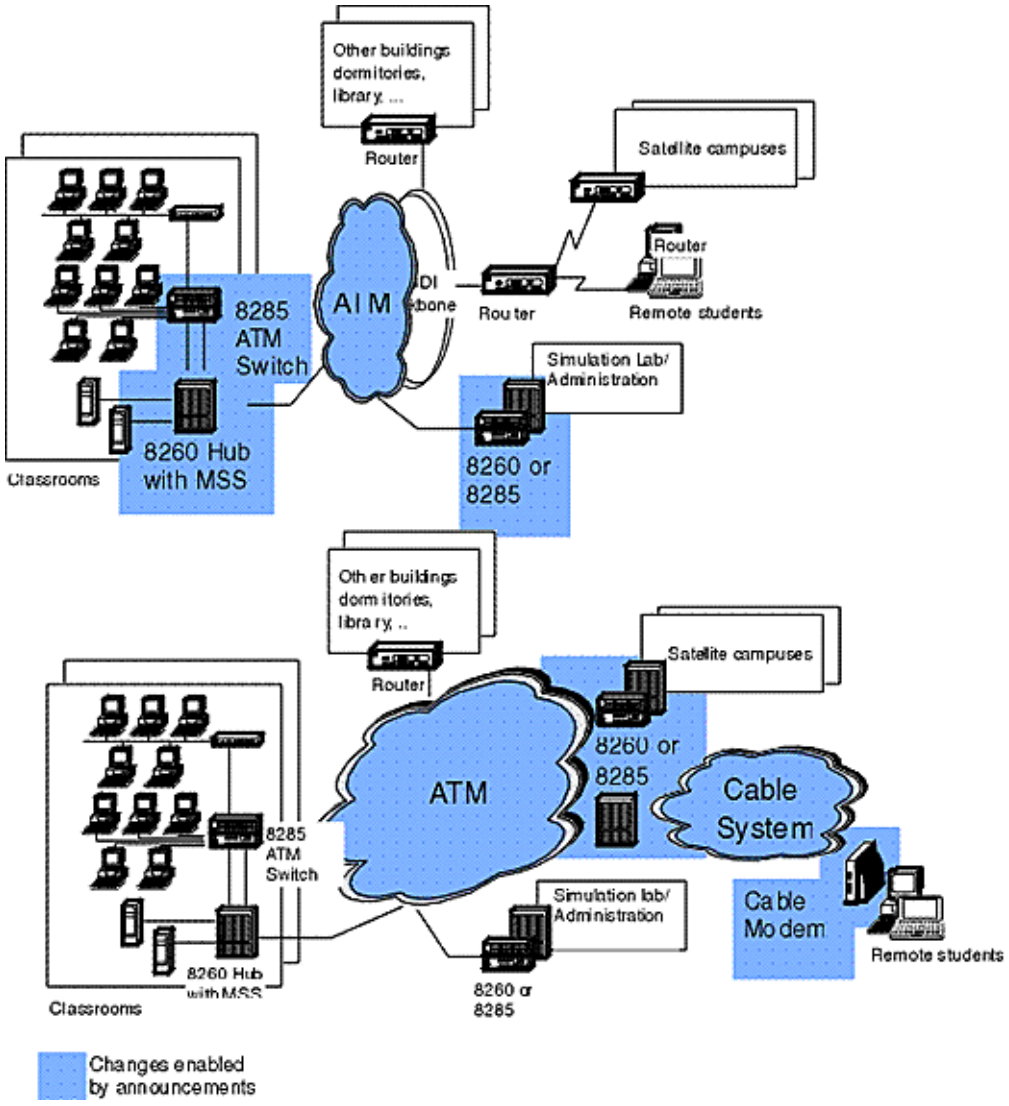


Figure 1. SVN and MSS–smooth migration for voice, video and data

They are now discussing running telephone connections over their ATM network using new circuit-emulation modules developed by IBM and FiberCom, and are excited about extending modeling and simulation techniques to other areas. They are confident that IBM will continue to deliver new support, like the new Super 8260 and 8274 ATM support previewed in this announcement, that will let them grow their network without requiring fork-lift upgrades.

LAN switches–a low-cost path to added capacity

Managed health care is under more scrutiny than ever before. IBM was able to show a managed health care firm with 15 hospitals and clinics how to deliver better care at lower costs by automating medical records and introducing telemedicine. IBM helped the managed health care firm cut record-administration costs by 25%, virtually eliminating lost records, and built a foundation for network computing that helps differentiate the firm from its competitors.

The managed health care firm had grown quickly by acquiring local hospitals in a four-state region. Maintaining up-to-date patient records was difficult, and delivering those records to a

new location quickly when the patient moved or required treatment away from home was almost impossible. The health care CEO was eager to link their hospitals and clinics for remote consultation, research and training, but their hybrid records system and existing network precluded any significant implementation of telemedicine.

An IBM Business Partner™ with a long-standing relationship with the firm was asked to advise the CEO. They suggested some simple changes that solved the records problem and set the direction for further savings and competitive advantages. The Business Partner suggested computerizing all patient records, using data entry, converting existing records to images (by using OCR), and by capturing images directly from X-ray, MRI and CAT devices. They recommended storing the records in a single, central location and delivering them to remote hospitals and clinics as needed.

The Business Partner proposal included 8273 and 8274 LAN Switches with WAN links over a Frame-Relay network to the central site. The Business Partner also recommended 8271 LAN Switches for small workgroups and 8260s with switch modules for larger hospitals. The LAN switches gave the firm the capacity they needed for image applications without rewiring or changes to PCs and terminals. Since the LAN switches support VLANs over the WAN (an IBM exclusive), the firm was also able to reduce administrative expenses by eliminating many tasks involving moves and changes, while giving similar departments in the remote hospitals the appearance that they are on the same LAN. Figure 2 shows how LAN switches were used to add capacity for image transfer.

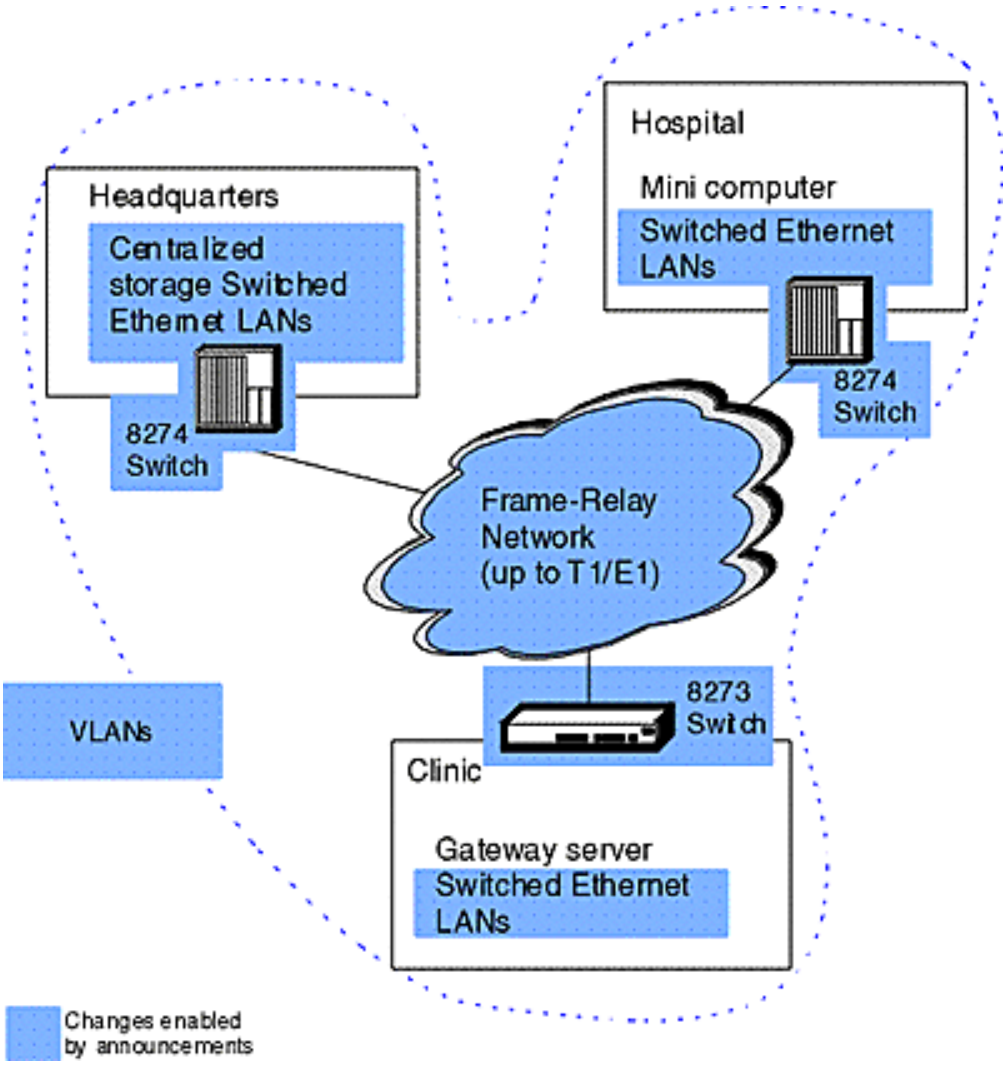


Figure 2. LAN switches-added capacity for image transfer

The CEO was especially excited about their new telemedicine capabilities, and the fact that the IBM LAN switches protected their investments because they could be changed or upgraded simply by adding or changing plug-in modules. The CEO is now looking forward to ATM, a straightforward migration with IBM switches, which will give them even more of a competitive advantage.

Automated management improves productivity

The appliance business, like many others, requires broad product lines with many options and the ability to respond quickly to changes in consumer preferences. An electronics appliance manufacturer recently found itself plagued by growing network operations costs. With IBM's help the company simultaneously simplified operations and improved network efficiency, establishing the highest levels of productivity ever.

The manufacturer had separate sites for its radio, recording and laser-optical product lines. Although its engineering and manufacturing processes were highly organized and efficient, its network operations were not. They had skilled operators at headquarters and each plant site, but network problems would occur without warning. Many problems required headquarters specialists

to travel to the plant sites. The CEO decided to apply some of the same concepts used to streamline engineering and manufacturing, and turned to IBM for suggestions for streamlining operations and reducing costs.

IBM told the CEO about other successful management applications, and how these applications could improve network operation while lowering operations costs. The fact that the manufacturer was using Windows NT and HP UNIX®posed no problem, IBM said. IBM's integrated Nways managers run on Windows, Windows NT, AIX®and HP UNIX.

The manufacturer installed the new Nways Workgroup Manager for Windows NT for plant sites, the Nways Campus Managers for HP-UX for headquarters and the Nways Enterprise Manager for the WAN. These applications made it easier to find and fix problems, resulting in fewer outages of shorter duration, and gave the network administrators up-to-the-minute, graphical network and component status at a glance. Because the specialists can see from headquarters what the plant operators see locally, they can make suggestions without traveling. Increased consistency among sites also led to reduced training, improved end-user support and increased staffing flexibility. Figure 3 shows how management applications are used to collect information from the campus network and send it to the central site for analysis and display.

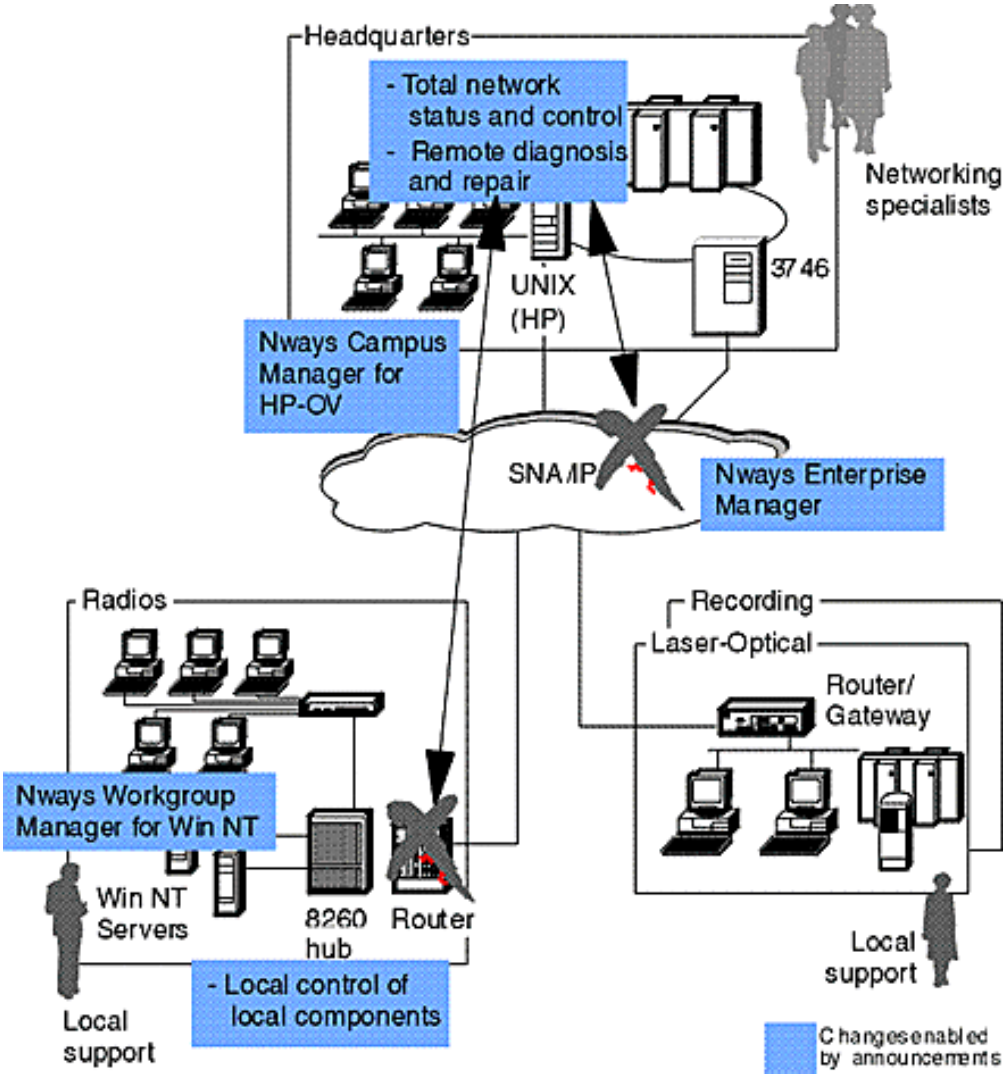


Figure 3. Automated management–a network-wide view for information and problem

determination

The CEO was satisfied with the new streamlined network management process, and even more satisfied with a 30% reduction in operating expenses.

Although the manufacturing company required support for only Windows NT and HP-UX, customers with Windows or AIX instead of Windows NT or OpenView can also benefit by using Nways managers for those platforms.

Additional Technical Details

SVN solutions that offer the most complete implementation of Multiprotocol over ATM (MPOA)

IBM continues to deliver ATM function that is far ahead of other ATM solutions by announcing Release 1.1 of the 8210 MSS Server and the 8260 MSS Module.

Initially the MSS Server offered emulated LANs (ELANs) to combat the problem of single points of failure. With the availability of *Super VLANs* in Release 1.1, the 8210 increases scalability and makes running an ATM network easier by allowing switching between VLANs instead of routing or bridging.

A Super VLAN is a collection of standard ELANs, where clients on any of the ELANs can establish a link to any other client on the Super VLAN. Basically the Super VLAN emulates one large ELAN with the LAN Emulation Server (LES) function distributed throughout the ATM network. The more ELANs you have in your Super VLAN, the more the performance and reliability of your LAN Emulation (LANE) services increase as you are switching between them.

This distribution of LANE services is handled by *Short-Cut Bridging (SCB)*. SCB forwards LANE control frames between SCB ports, allowing clients attached to LESs to establish direct links to each other.

To complete the distribution, SCB employs two additional functions, Bridging BroadCast Manager (BBCM) and Dynamic Protocol virtual LANs (D-PVLANs). When BBCM is unable to resolve a broadcast, D-PVLANS will forward it to the appropriate segments.

And MSS now supports ATM Virtual Interfaces. With the inclusion of this function, additional virtual interfaces can be assigned to a physical interface when needed to support more protocol interfaces. The result is improved performance in large, complicated networks and additional assistance for multicast routing protocols such as OSPF.

Another improvement implemented in Release 1.1 is to the redundant ARP server function for Classical IP. You can now configure which MSS Server is your primary ARP server and which is your secondary. When both servers are active the designated primary server will handle all incoming calls, or if the designated secondary server is active and the primary server comes online, the secondary server will allow the primary to take over.

MSS is also adding support for FDDI connectivity. Since many networks use FDDI as a backbone to connect routers, bridges and servers, migration from a router-based network to a switched-based network often entails migration from FDDI to ATM. MSS makes the migration easier by routing between FDDI and ATM and adding protocol support for IP, IPX and AppleTalk.

MSS is also providing support for NHRP, one of the main functions expected in the MPOA standard. NHRP allows client to find a *cut-through* path through the ATM network, allowing data to traverse IP subnets without the delay caused by going through intermediate routers.

In addition IBM's 8260 offerings have been expanded to include new models, WAN, ATM and switching modules, new adapter cards and extended protocol support.

One of the new adapter cards is the High-End Token-Ring MAC (HTMAC) card, which uses the same daughter-card position as the Token-Ring MAC (T-MAC) card, but supports the full set of 13 RMON groups for superior network monitoring and traffic analysis. It uses a RISC engine to achieve higher performance levels, and provides network management support from LAN Network Manager for AIX through Token-Ring LAN agents, Configuration Ring Server and Ring Error Monitor.

And IBM has now developed the ATM 155-Mbps MMF I/O Card to be used on any ATM 12-port, 25-Mbps module, allowing you to add 1 ATM 155-Mbps port per module, saving module slots in the 8260. Because the 25-Mbps module fits in the IBM 8285 Nways ATM Workgroup Switch expansion unit, the 155-Mbps card also saves slots there, allowing the 8285 to handle up to 4 ATM 155-Mbps MMF ports while keeping its capacity to handle up to 48 ATM 25-Mbps ports.

For customers who already have ATM backbones but want to connect their sites with ATM native links, IBM is offering the ATM WAN Module 1.5 with 4-port E1/T1/J1 I/O Cards for the 8260, which can also be used in the 8285. The module and cards allow you to save line costs associated with other links while still supporting all AAL types and quality of service (QoS).

To accommodate the growing traffic requirements between ATM hubs, IBM has developed two ATM one-port, 622-Mbps Modules for the 8260. Each is a two-slot module available for MMF or SMF, complementing other 8260 ATM offerings including variable backbone uplinks at OC3 or OC12 (622-Mbps) levels, in addition to the various speeds intended for wide-area connectivity.

Also being announced is Version 3 of ATM Control Point, which supports both the new ATM E1/T1/J1 cards and the 622-Mbps modules, with the addition of support for the PNNI-1 protocol. ATM Control Point Version 3 is available for all 8260s and 8285s.

IBM is the first manufacturer to offer PNNI-1 support on both a workgroup switch and an ATM backbone switch. By providing PNNI-1 we give network managers flexibility in the way their ATM switches optimize the use of links-the network can automatically select lines for them by using the least-loaded route, or they can set up the ATM links to favor some lines over others.

Additionally PNNI-1 implementation simplifies LANE setup and increases LANE network reliability by allowing LAN Emulation Configuration Servers (LECSs) to be moved from one location to another without redefinition in either LANE systems or ATM switches. And further PNNI-1 support for *anycast* and *group address* allows the ATM switches to distribute the transaction load between ATM systems that are part of the same group address.

Included in the announcement for the 8260 are two new switching modules, the Packet Channel/ATM Switching Module and the LAN Access Switching Module.

The Packet Channel/ATM Switching Module is a two-slot module designed for Models P10, P17 and G17 of the 8260. It interfaces with the 2-Gbps Packet Channel on these models, allowing integration of Ethernet, Fast Ethernet and FDDI switching modules to the ATM backbone. Customers can migrate to ATM with no new major investments in equipment or cabling.

The LAN Access Switching Module is a two-slot module. It has 16 RJ-45 10BASE-T ports on the front panel and 8 internal segment connections on the shared LAN backplane along with connection to the Packet-Channel backplane. This configuration allows the module to connect with all of the other switching modules, as well as shared-media modules on the shared-LAN backplane.

No external 10BASE-T crossover connections are necessary, increasing system reliability and decreasing the costs associated with custom patch cables and shared-media ports. And because the LAN Access Switching Module is equipped with an on-board RMON probe, you get full RMON monitoring for a segment without a dedicated Ethernet MAC card.

And IBM is reference-selling the FiberCom Circuit Emulation Module, which, when installed in an 8260 or 8285, allows for transparent transport of channelized traffic such as PBX or ISDN

over the ATM link. The 8260 Circuit Emulation Module connects DS1 and E1 interfaces to the ATM network, so 8260s and 8285s can now be used to consolidate both voice and data traffic. This consolidation reduces line rentals and network operations, in addition to providing faster data transmission and higher availability.

LAN switching that gives your business a competitive advantage by cutting costs, increasing performance and consolidating networks

IBM continues to help you prepare for end-to-end ATM with the expansion of the LAN Switch Family product line. The additions include new LAN, WAN and ATM switching modules for the 8273 and the 8274, two new models of the 8274, and the IBM 8276 Nways Ethernet RoutePort.

Also included are two new UFCs, a FDDI UFC for the 8270, the 8271 and the 8272, and an RMON UFC for the 8270 and the 8272 that help you consolidate your networks and increase their performance.

As announced in December the 8273 now supports new uplink modules for ATM over E3 and full-duplex Fast Ethernet. The combination of either Ethernet module with the ATM E3 uplink in the 8273 provides E3 connectivity over ATM networks in international markets where E3 is the standard WAN option.

And there's an AUI Full-Duplex Adapter Board Module for the 8273 Model 10U that supports 10-Mbps, full-duplex transmission over a standard AUI port, allowing support for distances greater than those achieved through half-duplex transmission. When used in combination with a fiber media converter, you can connect a number of remote sites from one central RouteSwitch, allowing full transmission capacity in either direction.

Rounding out the offerings for the 8273 are the two- and four-port Frame-Relay Submodules, providing WAN connections for the 8273.

IBM is also announcing several new additions to the 8274 product line, including two new models, switching modules for Ethernet, Token-Ring, ATM, FDDI and WAN, the Management Processor Module (MPM-1G) and the Hardware Routing Engine (HRE).

The new 8274 Models W53 and W93 provide either four or eight slots for switching modules and include a single power supply-either 250 watts or 500 watts, respectively, that will power any configuration. Each model must be configured with at least one of the MPM-1G modules being announced and provides support for all of the switching modules currently available for the 8274.

Also offered for the 8274 are Ethernet switching modules. There are a Fast Ethernet Shared and Full-Duplex Switching Module that contains a combination of four shared, 100BASE-TX and one full-duplex, 100BASE-TX or 100BASE-FX port and a 100BASE-T Full-Duplex Switching Module that can be configured for either full- or half-duplex operation.

The Token-Ring offerings for the 8274 include the six-port Token-Ring Switching Module that allows end-user Token-Ring stations to connect to the switch through copper or fiber.

Also announced are the WAN Switching Modules, providing transportation for switched LAN traffic over a variety of public and private frame-oriented networks (DS3), and the ATM E3 Switching Module, allowing an E3 connection between endpoints in an ATM environment in countries where E3 is the standard WAN connectivity option.

Additional modules being announced today include the FDDI Switching Modules for 8274 Models W53 and W93. The new FDDI Switching Modules offer connectivity over greater distances than that offered by the existing FDDI Switching Modules, but otherwise provide the same function.

Also being announced is the new MPM-1G, which can operate the frame bus at 960 Mbps and can be combined with the HRE being announced today to provide a hardware routing engine. The HRE can then perform the IP and IPX routing functions that were previously done by software.

Also being previewed today for the 8274 are the new RouteCell Modules for Models 513, 913, W53 and W93. The RouteCell Modules are designed for ATM-cell switching and are intended to provide ATM connections when these models of the 8274 are used as ATM switches. In addition the Frame-to-Cell Switching Module, also being previewed, is required in 8274s configured with any of the RouteCell Modules.

The new 36-port 8276 Nways Ethernet RoutePort is designed to operate with the 8273 RouteSwitch. It allows you to expand your Ethernet networks by providing four segments, with port-switching between segments.

IBM further enhances its family of LAN switches by announcing new RMON and FDDI UFCs. The new RMON UFC, designed for use in the 8270 Model 800 and the 8272 Model 216, provides an interface to the Nways Remote Monitor Manager program, as well as to other RMON applications using the standard RMON MIB.

When installed in the switch you want to monitor, the RMON UFC will allow you to monitor a single port that is specified through configuration, or to monitor in a roving fashion all of the LAN segments attached to the switch.

Another new UFC client offering is the FDDI UFC, which connects the 8270, the 8271 or the 8272 to an FDDI server or backbone. It supports interconnection of 8270s and 8272s using a FDDI backbone, provides bridge access from Token-Ring or Ethernet ports to high-speed stations on a FDDI backbone and offers additional 100-Mbps uplink options.

Cable On-Line Access System-providing faster and more responsive Internet and intranet access

IBM continues to provide the resources you need for responsive access to the Internet and intranets and mixed data over ATM by announcing the Cable On-Line Access System.

The Cable On-Line Access System is an ATM-based system that provides high-speed data over HFC networks such as those used in the cable TV infrastructure. It consists of the IBM Cable Modem, the IBM 8034 HFC Receiver Shelf and the IBM 8260 HFC Module, which all work together with IBM's Cable On-Line software to create the complete Cable On-Line solution.

The IBM Cable Modem connects to a workstation through an Ethernet 10BASE-T connection and to the HFC network through a standard coax connection. The 8034 receives the data from the cable modems and sends it up to the HFC module in the 8260, where the access and management of the modems is controlled.

The system, which is ATM-based and utilizes SVN architecture, provides remote location access with the capacity to handle the high bandwidths necessary to run high-speed data over the HFC infrastructure.

A networking kit to start a small Ethernet LAN

IBM has simplified and lowered the cost of installing a small Ethernet network for small offices, home offices and home PC users with two or more PCs by offering the IBM EtherJet Networking Kit. The kit, which includes an 8222 Ethernet Workgroup Hub, three EtherJet 10BASE-T ISA Adapters, software drivers for all major operating systems and three 15.2-m (50-ft) twisted-pair cables, is easy to install and configure and includes everything you need to set up a 10BASE-T Ethernet network.

Simplified network management for any platform

IBM continues to help you lower your costs and increase the availability of your network by providing network management programs for a wide range of platforms that allow you to view and control what's happening on your network.

The Nways management products are more powerful than ever, allowing you to manage more nodes and more device types on almost any platform. Included in this announcement are new versions of the Nways Campus Managers for HP-UX and the RouteSwitch Network Management Suite, as well as a new product, the Nways Workgroup Manager for Windows NT, the Nways Workgroup Remote Monitor (RMON application) for Windows NT, and previews for the Nways Campus Managers for AIX, new RMON2 support on AIX and new Web-based management support based on the state-of-the-art Java technology for selected IBM networking hardware.

The Nways Campus Managers for HP-UX allow you to configure, control and maintain LANs, VLANs, WANs and ATM networks from a single management application. The Suite consists of three applications, the IBM Nways Campus Manager LAN for HP-UX, the IBM Nways Campus Manager ATM for HP-UX and the IBM Nways Campus Manager Remote Monitor Advanced for HP-UX.

Included in the Campus Manager Suite are functions that support:

- VLAN management using ATM Forum-compliant LANE, allowing you to define logical LANs over an ATM network
- Simple LANE administration
- Search, storage and retrieval of key management information using an open ObjectStore™ database
- Distributed polling that saves the management station from having to poll large groups of routers
- Remote monitoring using the RMON2 standard (based on the Enterprise Communications Analysis Module [ECAM] module), allowing full control of your network applications and the ability to manage both physical network resources and network services
- Comprehensive device management for the full set of IBM Campus devices
- Management for non-IBM ATM devices

IBM has also enhanced the RouteSwitch management programs to include new applications and updates to existing management programs. Announced today are new versions of the IBM 8274 Nways RouteSwitch Software, the IBM 8273 Nways RouteSwitch Software, the IBM Nways RouteSwitch Network Manager, the IBM Nways RouteTracker Manager, the IBM Nways RouteMonitor Manager and the IBM Nways RouteDirector Manager.

The RouteSwitch software for the 8273 and 8274 has support for the models and modules being announced, including the previewed 8274 RouteCell modules. There is also new software that provides enhanced internetworking for both the 8273 and the 8274. Other updates to 8273 and 8274 RouteSwitch software include:

- Nways RouteSwitch Network Manager V 3, providing complete configuration, monitoring and diagnostic information for your entire RouteSwitch network

- Nways RouteTracker Manager V 3, a powerful graphical application, allowing users to create and manage policy-based VLANs
- Nways RouteMonitor V 3, providing the network administrator with the ability to gather statistics and events from any individual RouteSwitch or any number of switches in the network.
- Nways RouteDirector V 3, providing network-wide ATM connection and service configuration and management, specifically designed to manage the RouteCell product line.

Continuing its support of the functions you need on industry-leading platforms, IBM also is announcing the Nways Workgroup Manager on Windows NT and the Nways Workgroup Remote Monitor (RMON support) for Windows. In addition to all of the functions supported by the Nways Manager for Windows, the Workgroup Manager provides additional, graphical device-management support, and it is IBM's intention to provide Web-based management support.

The Nways Workgroup Remote Monitor application provides management support for RMON-compliant agents and IBM RMON2-enabled products. IBM's current RMON2 implementation is based on the ECAM.

IBM is also previewing for announcement the IBM Nways Campus Managers for AIX, which will support the new features announced by the 8260, 8273 and 8274, and ATM-specific features like PNNI-1, the 8260 Video Distribution Module and Web access for ATM topology and configuration.

Another previewed product, the IBM Nways Traffic Monitor for AIX Version 1, will allow you to take network monitoring to the next level: the application level. Utilizing the information provided by RMON and RMON2 probes, Nways Traffic Monitor will provide the ability to graphically display and manage end-to-end connection traffic in your network.

Summary

IBM continually backs up its commitment to meet the challenges and demands of your campus network, offering top-notch products, services and solutions, including:

- Improvements to IBM's SVN products with more than 30 new or enhanced LAN, campus backbone and WAN switching solutions for Ethernet, Fast Ethernet, Token Ring, FDDI, Frame Relay and ATM
- New MSS support in the 8210 and the 8260 that delivers high capacity, providing two to four times better response times than router-based networks, increased redundancy, reducing or eliminating single points of failure and switching between VLANs instead of routing or bridging
- Increased capacity and new connectivity in the LAN switches that make it easier to build virtual LANs, saving you up to 50% in operating costs
- Up to 50% lower prices per port for the 8260 and LAN switches
- Integrated Nways management products that keep networks running by detecting trouble spots before they cause outages and that reduce operational costs up to 25%

We're using our award-winning technology to deliver the SVN solutions you need to support the advanced applications you want, with the added benefits of lower costs, higher performance and easier network administration.

Benefits

Benefits	Details
SVN Solutions	
MSS offers increased responsiveness, simplified networks and lowered costs through increased network capacity and the elimination of single points of failure.	Enhancements to MSS allow switching between VLANs instead of bridging or routing, taking you to the next stage of SVN through the implementation of Multiprotocol over ATM (MPOA), with support for Super VLANs, QoS for VLANs and FDDI-to-ATM migration.
The 8260 provides high-capacity ATM backbone solutions and simplifies networks that mix ATM and non-ATM segments.	The previewed Super 8260 promises 8260 ATM support with four times as much capacity as prior models. When combined with the new ATM and switching modules and the enhancements to the ATM Switch/Control Point software with PNNI-1 support, the interconnection between multiple protocols becomes painless and cost-efficient.
The 8260 FiberCom Circuit Emulation Module simplifies high-performance networking by consolidating separate voice and data networks.	The 8260 FiberCom Circuit Emulation Module provides PBX users with a way to connect across PVCs on an ATM network, utilizing the ATM network investment to eliminate the expense of dedicated leased lines.
LAN Switch Solutions	
8273 and 8274 modules double the capacity of connected segments with full-duplex support and use inexpensive Frame-Relay networks as well as ATM networks to interconnect campus networks.	The new module offerings for the 8273 and the 8274 provide ATM DS3 and E3 connections that allow you to simplify your network by linking campus networks across a wide-area ATM network. And the announced Ethernet modules provide full-duplex, 100-Mbps Ethernet service, with up to 200-Mbps Fast Ethernet service on the 8274, for servers, power users and network backbones. The Frame-Relay WAN modules that support T1/E1 speeds also help you save money by implementing low-cost Frame-Relay networks to interconnect your various campus networks.

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Benefits (Continued)

Benefits	Details
The 8274 simplifies networks and lowers costs by protecting your investments, supporting larger networks with fewer components, increasing the maximum size of campus backbones and eliminating single points of failure.	With the 8274 wide-slot chassis models, ATM cell backplane, Multiprotocol Management Module and Hardware Routing Engine that provides hardware routing, you can continue to support large campus networks with fewer components, saving overhead costs in equipment and management. In addition the various ATM module offerings allow you to connect your campus networks to ATM backbones or WANs and also provide very-high-capacity solutions for demanding applications and network backbones. And the 8-port 155-Mbps modules help lower the cost of accessing or building a 155-Mbps ATM campus backbone by supporting 8 ports on a single module. Other module offerings include the Frame-to-Cell Switching Module that gives your interconnected LANs and ATM networks the appearance of a single network, easing the task of network management. There are also Token-Ring and FDDI modules that provide interoperability and increased capacity for Token-Ring networks and increased size for FDDI campus backbones. In addition the Ethernet and Fast Ethernet modules allow greater flexibility, interoperability and throughput for switched Ethernet networks.
The 8276 economically extends the size of switched Ethernet networks and allows larger VLANs.	The 8276 Ethernet RoutePort, when combined with the 8273 RouteSwitch, provides a cost-efficient way to expand your switched Ethernet networks by providing port-switching between segments and higher density 8273 and 8274 port connectivity.
8271, 8272 and 8270 UFCs simplify networks and lower costs by interconnecting switched LAN workgroups with FDDI backbones, giving interconnected LANs the appearance of a single network and increasing network manageability.	The FDDI UFC now offers Ethernet and Token-Ring LAN switch users a high-speed connection to FDDI servers and backbones, while the RMON UFC offers monitoring and performance reporting with full Token-Ring support.
Cable On-Line Access	
The Cable On-Line Access System provides access to high-speed data services and the Internet.	The Cable On-Line Access System offers customers the advantages of high-speed data transmission with advanced ATM-based MAC, as well as the assurance of secure, private communication.
EtherJet Networking Kit	

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Benefits (Continued)

Benefits	Details
The EtherJet Networking Kit offers a simple, low-cost introduction into the most popular LAN technology.	Customers receive an all-in-one price advantage with the EtherJet Networking Kit that is easy to install, offers the high performance of IBM's EtherJet Adapters and still allows for network expansion.
Network Management	
IBM Network Management programs lower your administrative support costs and increase your network availability.	IBM's integrated management solutions allow you to manage your networks remotely using smart agents, RMON and RMON2 and Web-based management. A wide variety of network operating-system platforms allow you to choose the platform best suited to your existing operating environment. And the Nways RouteSwitch Software Programs improve your network security, help reduce network outages and simplify ATM subnetwork connections through Forum-compliant PNNI-1 support, Token-Ring LANE client and LANE enhancements and improved diagnostics.

Positioning

Category	Positioning Details
SVN Solutions	
MSS Server	MSS provides Super VLANs, which are very scalable, providing high performance, low latency, low costs and fully redundant implementations of the campus infrastructure. It enables one-hop, zero-hop routing implementations of the SVN architecture. It is positioned as the solution for customers who are ready to update their current campus infrastructure or to prepare for new applications that have QoS requirements such as voice or video. ATM is the only technology that will meet these networking needs, and MSS is an important part of the ATM solution. MSS provides the only data infrastructure that will scale from the smallest to the largest network, and it provides the highest level of network performance by allowing ATM to switch data from end to end without intermediate frame-processing along the way. It also provides increased reliability by eliminating single points of failure and providing redundancy of every networking function.

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Positioning (Continued)

Category	Positioning Details
8260	IBM is the only company that offers a hardware platform (unit and power supply) that can be used for shared and switched LAN technology, ATM and higher gigabit ATM directions. This platform ensures investment protection and leading-edge technological solutions for your campus network. The ATM modules for the 8260 will benefit customers who need high-speed connectivity to either an 8260 or an 8285, but who also require desktop connectivity. Customers who are looking for a backbone solution that will handle high-capacity data, voice or video will also benefit, especially since the 8260 can now handle four times the capacity as prior models. The new additions to the 8260 Switch Modules Series will also be attractive to customers who have a mixture of ATM and non-ATM network segments. By configuring your 8260 with any of the switch modules, you can simplify your network, making it more cost-efficient and easier to manage. (For further positioning information about the 8260 Switch Module Series, see the positioning information for Nways LAN Switches.) The FiberCom Circuit Emulation Module will appeal to 8260 customers who have requirements for PBX connectivity between remote sites, circuit-emulation services or the consolidation of leased lines onto the ATM network.
LAN Switch Solutions	

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Positioning (Continued)

Category	Positioning Details
Nways LAN Switches	The 8273 and the 8274 are significant additions to IBM's broad range of networking products designed for high-speed, integrated networks, providing any-to-any connectivity with high performance and capacity at a low price. The 8273 is a low-cost, midrange solution designed to provide access to ATM, FDDI or Ethernet backbones. It is especially suited for customers who need extensive VLAN support, integrated routing and Fast Ethernet workgroup connectivity. The 8274 will appeal to customers looking for functionality and higher port density with its unique combination of LAN switching coupled with the ability to do ATM switching to the desktop and the backbone. Customers who are looking for a cost-efficient way to expand their switched Ethernet network will be interested in the 8276 because it offers high port density with the ability to segment the LAN and is compatible with the 8273 and 8274 VLAN solutions. The Switch Modules Series for the 8260 models with Packet-Channel backplanes (Models P17 and G17) offers high port density solutions for Ethernet, Fast Ethernet and FDDI. When combined with the Packet Channel/ATM Module, the 8260 becomes a flexible platform for migration to ATM. The 8271, 8272 and 8270 FDDI UFCs should be considered for customers who have a LAN switch and need an uplink to a FDDI backbone.
Cable On-Line Access	
Cable On-Line Access System	The Cable On-Line Access System is a key component of the complete end-to-end solution for networking systems in an HFC environment. It fits the needs of traditional HFC network operators, as well as providing a solution for organizations that require high-speed data services such as Internet access, remote learning applications and high-speed graphical and information exchange for remote users.
EtherJet Networking Kit	
Small Ethernet LANs	The EtherJet Networking Kit will be particularly attractive for small-office or home-office users who want to establish a network connection between two or more machines at their site. The solution is easy to install and configure, provides all of the elements required to set up a 10BASE-T network and still provides for network expansion. It is also priced competitively and is fully supported by IBM services.
Network Management	

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Positioning (Continued)

Category	Positioning Details
Network Management	The Nways Campus Managers for HP-UX provides cost-savings and simplified installation and operation for customers who need more than one of the Nways Campus Managers for LAN, ATM or Remote Monitor, offering a comprehensive management solution for customers with Token-Ring, Ethernet or FDDI networks, VLAN management for ATM networks and remote analysis that allows customers to identify problems between networks. Nways Workgroup Manager and Remote Monitor are the recommended network management products for customers with small networks or large networks divided into autonomous workgroups, who want a low-cost, ready-to-run centralized management solution for their networking devices on a Windows NT-based management platform. The Nways RouteSwitch Software Program allows customers who have 8273s or 8274s installed to manage their network devices, including VLAN management that adjusts to traffic surges and network outages and management of Frame-Relay connections, redundant Ethernet, duplicate MAC addresses and Token-Ring frame copy. The Nways Campus Managers for AIX is the best way for customers running an AIX platform to manage their medium-to-large campus networks, including high-speed backbones built with ATM and LAN switches.

For more information

This Fact Sheet is an overview of the 11 March 1997 Networking announcement of Campus products and solutions. Some products may not be announced in your country. Refer to product announcements for your specific country or contact your local IBM representative or IBM Business Partner.

This Fact Sheet, along with the following related Fact Sheets that supply more details, can be obtained in softcopy from MKTTOOLS, PCWIN and NETWIN databases:

- *IBM Networking Campus Overview Fact Sheet*
- *IBM Nways ATM Solutions Fact Sheet*
- *IBM Enhanced Nways LAN Switching Solutions Fact Sheet*
- *IBM Nways Management Solutions for Campus and Enterprise Networks Fact Sheet*
- *IBM Cable On-Line Access System Fact Sheet*
- *FiberCom Circuit Emulation Module Fact Sheet*
- *Price and Availability Date Summary Fact Sheet for Campus Products Announced 11 March 1997*

You can also access this information on the IBM Networking Home Page at `http://www.networking.ibm.com`.

The *Price and Availability Date Summary Fact Sheet for Campus Products Announced 11 March 1997* contains prices in U.S. dollars for all products in this Fact Sheet, as well as U.S. general availability, part numbers, feature codes and related information. Each of the other Fact Sheets is available in a form with or without this extra information.

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