



# MATRIX E7 INTELLIGENT ACCESS PLATFORM



6C107

### Comprehensive Traffic Control at Critical Network Access Points

Traffic regulation to and from servers and desktop users at the network edge  
Guaranteed delivery of critical applications such as Voice over IP and multicast video  
Advanced security filtering based on Layer 2-4 information  
Traffic shaping with per-port bandwidth provisioning and queue management, enabling service level agreements (SLAs)

### Low Cost of Ownership

Advanced Layer 2-4 traffic control without expensive, complex routing solutions  
Next-generation nTERA™ backplane completely compatible with 1st, 2nd and 3rd generation modules

### High-Density, Scalable Switching for Data Centers and High-Performance Wiring Closets

Supports 336 10/100 ports, scalable to over 500 / 42 Gigabit ports, scalable to over 80  
Wire-speed Layer 2-4 services / scalable to > 100 million packets per second  
Scalable for emerging technologies: 10 Gigabit Ethernet, DWDM Optical Uplinks, Jumbo Frames

### Industry-Leading Uplink Options for Cost-Effective Technology Migration

Gigabit Ethernet 1000Base-SX/LX/ELX (70km) and 1000Base-T (Gigabit over Copper)  
ATM OC-3 and OC-12 / FDDI / multiple WAN options including T1/E1 and modem

### Superior Fault Tolerance for Maximum Uptime

Distributed switching architecture with no single point of failure

### High Availability Features Based on Emerging Industry Standards

Link aggregation (IEEE 802.3ad) / Per-VLAN spanning (IEEE 802.1s) / Quick Convergence Spanning Tree (IEEE 802.1w)

### Intuitive Management for Rapid Deployment & Troubleshooting

SMON / RMON 1 / 802.1Q IETF MIB / NetSight Device and VLAN Management applications

### High-Density, Multiservice Switch for Growing Enterprise Networks

Enterasys' new Matrix E7 delivers comprehensive data management, embedded application and protocol control, per-port bandwidth provisioning, with a revolutionary nTERA™ backplane.



### Next-Generation Infrastructure

Networking infrastructure has become a source of competitive advantage in today's economy. Advanced Internet-based applications are driving fundamental shifts in how business is transacted, how services are provided, how the supply chain is managed, and how global employees and partners are connected. To enable applications in key areas such as web-based content distribution and converged voice/video/data, today's infrastructure must be intelligent and cost-effective.

The Enterasys Matrix E7 is the first in a new generation of networking solutions. Providing intelligent switching at

user and server access points, the Matrix E7 is ideal for data centers and high-performance wiring closets. The E7 delivers pinpoint control to critical network entry areas, without the expense and complexity of competitive routed solutions.

By embedding Layer 2-4 services on advanced ASICs, the Matrix E7 brings comprehensive quality of service, security and traffic containment to desktops and servers at the network edge. Network managers can now guarantee delivery of high-priority applications, enable service level agreements (SLAs) by provisioning band-

width, and prevent security breaches by stopping them at their sources.

In addition, the Matrix E7 provides the throughput and port densities needed to eliminate bandwidth concerns and serve in the largest networks. The new nTERA™ backplane design guarantees investment protection by anticipating future developments such as 10 Gigabit Ethernet, while accommodating previous generation switching modules. To ensure "five-nines" availability, the Matrix E7 is designed with no single point of failure, and with standards-based high availability firmware features.

## Comprehensive Security

The Matrix E7's robust security keeps intruders out of your network:

- Innovative security filtering
- IP access control lists
- Radius authentication
- SNMP management VLANs
- User-based security and authentication
- Port-based MAC address locking
- Dynamic egress feature prevents passive analyzers from snooping
- Supports emerging 802.1X authentication standard

## Investment Protection Through SmartSwitch 6000 Compatibility

Because protecting customer investments is a primary goal of Enterasys, the Matrix E7 has been specially designed to support existing SmartSwitch 6000 modules, providing true backward compatibility. Customers have the flexibility to use their current 6000 switch modules in the new chassis and add new, higher-performance Matrix modules at their own pace. With over four million ports installed to date, the SmartSwitch 6000 family has a proven track record of providing reliable network connectivity. The Matrix E7 preserves this connectivity (and respective capital equipment investments), while seamlessly letting customers take advantage of new technologies and capabilities as needed.

## New nTERA™ Backplane Design

The nTERA™ backplane is the key to providing full SmartSwitch 6000 module compatibility and supporting next-generation switching modules. All existing modules for the SmartSwitch 6000 system can be migrated into the new Matrix E7 chassis. The nTERA™ backplane capacity of 420 Gbps ensures scalability for emerging technologies such as 10 Gigabit Ethernet.

## Integrated Backbone Connectivity Options

The Enterasys Matrix E7 provides integrated uplinks on selected switching modules. Using this approach, it is not necessary to dedicate an entire slot in the chassis to uplinking, and user connectivity is maximized. A variety of modular uplink line cards can be installed to provide high-speed connectivity to backbone networks including OC-3 or OC-12 ATM, Gigabit Ethernet (including Gigabit over Copper), FDDI and WAN.

Future uplinks will include support for a new IEEE 10 Gbps Ethernet standard interface. Other high-capacity uplinks are planned to support Dense Wave Division Multiplexing (DWDM), optical network transport systems for metropolitan service provider networks, and long-haul telecom carrier network applications.

## Built-in Firmware Feature Set

The Matrix E7 provides a very broad, yet standards-based firmware feature set based on mature SmartSwitch 6000 technology. Unlike other switch competitors, Enterasys includes advanced multilayer switching services, 9 groups of full RMON management per port and feature-rich configuration/classification capabilities at no additional charge.

## Multilayer Frame Classification

Multilayer frame classification is a process used by the Matrix E7 to deliver key functionality including:

- Dynamic 802.1Q VLAN membership
- Advanced traffic filtering based on Layer 2-4 information
- Securing MAC/IP addresses of vital network resources
- Constructing a committed information rate (CIR) by provisioning bandwidth
- Prioritizing voice or multicast traffic in the network using 802.1p to deliver QoS capabilities

## Inherent Quality of Service (QoS)

Essential to the successful support and delivery of business-critical applications, the Matrix E7 allows network administrators to apply quality of service using multiple processes including:

- Assigning 802.1p traffic classes to received frames based on parameters such as end station address, IP TOS, or Layer 4 (TCP/UDP) socket number
- Bandwidth provisioning inbound traffic to insure that a SLA can be met
- Bandwidth provisioning outbound traffic to ensure that the high-speed uplinks are not over-subscribed
- Mapping traffic classes to prioritized queues
- Strict and Weighted Fair Queuing (WFQ)

## End-to-End Security

The Matrix E7's SNMP host can be secured using several methods including IP access control lists, radius authentication and SNMP management VLANs. These comprehensive security features ensure that the switch is protected from intruder attacks.

Additional protection includes user-based security and authentication. The Matrix E7 delivers this through port-based MAC address locking and supports the emerging 802.1X authentication standard. Port-based MAC locking can be configured to allow only a "trusted" MAC address to transmit data onto the network. Traffic from any "non-trusted" device is automatically discarded. The dynamic egress feature lets switches prevent passive analyzer devices from snooping sensitive network traffic, ensuring maximum security.

## IEEE 802.1Q VLANs

The Enterasys Matrix E7 fully supports the 802.1Q VLAN standard, which includes GARP/GVRP VLAN protocol. GVRP is a VLAN messaging protocol that significantly reduces manual VLAN configuration. As a result, administrators spend less time on day-to-day adds, moves and changes—which lowers operating costs.

## High-Availability Topology Services

In addition to full 802.1D bridging support, the Matrix E7 provides support for emerging high availability Spanning Tree functionality such as:

- Rapid Convergence (802.1w) can reduce link convergence time to less than two seconds
- Per VLAN Spanning Tree (PVST, 802.1s) provides PVST spanning tree domains with fewer devices, which minimizes the number of users affected by a re-span of the network.

## IP Multicast Support

With full support for IGMP version 1 and 2, network managers can deploy multicast applications, such as streaming video, without hindering network performance. This Layer 3 awareness guarantees that multicast traffic is delivered to only the required recipients, conserving precious bandwidth.

## Advanced Traffic Analysis Capabilities

A crucial requirement for high-end enterprise or service provider customers is the ability to access traffic trending and analysis capabilities. The Matrix E7 meets this goal with embedded RMON (all 9 groups), and SMON at no additional cost. Another key requirement for comprehensive traffic analysis is the ability to mirror traffic to a probe or protocol analyzer. With SmartMirror, the Matrix E7 forwards all traffic from a specific port or VLAN to a user-specified port for detailed analysis.

### Challenge

### Solution

Guarantee availability of critical applications in areas such as Enterprise Resource Planning and Voice over IP

- Comprehensive application-based Quality of Service

Enable service level agreements (SLAs)

- Per-port bandwidth provisioning and queue management

Improve security at network access points

- Packet filtering based on Layer 2-4 information
- Secure management with access control lists

Control network costs

- Advanced traffic control without expensive, complex routing solutions
- New nTERA™ backplane protects investments by providing compatibility to all previous, current and future generation switch modules

Ensure scalability for new users and applications

- >500 10/100 ports
- >80 Gigabit ports
- Throughput > 100 Mpps
- Support for emerging technologies
  - 10 Gigabit Ethernet
  - Optical uplinks such as DWDM
  - Jumbo frames

Seamlessly migrate connectivity

- Industry-leading uplink options including
  - Gigabit Ethernet 1000Base-SX/LX/ELX (70km) and 1000Base-T
  - ATM OC-3 and OC-12, FDDI, WAN
- Advanced Router Module for wire-speed IP/IPX routing

Effectively deploy, measure and troubleshoot network infrastructure

- Intuitive, GUI-based NetSight management applications
- Supports industry-standard management including:
  - RMON 1 and SMON
  - 802.1Q IETF MIB

## Why the Matrix E7 is a Better Switching Solution

- Unique bandwidth provisioning
- Advanced Layer 2-4 Services
- Lowest Price Per Port
- Guaranteed Reliability and Scaling
- Superior Connectivity
- True Investment Protection

## SNMP-Based Management

The Enterasys E7 management is based on SNMP, supporting the most relevant standard MIBs for LAN switching equipment. This standards-based approach means the Matrix E7 can be easily controlled by management applications from Enterasys Networks and third parties.

## Management Access

There are two methods for accessing the Matrix E7's management features:

- Local (out-of-band) — Uses serial ports (RS232 Com) located on the modules that have access to the CPU to manage local consoles
- Remote (in-band) — Uses Telnet, WebView or SNMP to access the console application through any switch port or module

## NetSight Element Manager

NetSight Element Manager is an easy-to-use network application from Enterasys that provides comprehensive remote management support for intelligent network devices—as well as any SNMP MIB I or MIB II manageable devices. This intelligent, OLE- and ODBC-compliant application allows you to easily embed applications such as spreadsheets into network maps to chart statistics.

## NetSight VLAN Manager

Enterasys' NetSight VLAN Manager application allows users to configure and manage their 802.1Q switches, ports, and VLANs from a single workstation on the network using an easy-to-use graphical interface. This eliminates the need to configure each switch in a domain via local management or make frequent trips to the wiring closet to regroup users. All 802.1Q administration tasks can be accomplished without ever leaving the workstation.

## Why the Matrix E7 is a Better Switching Solution

The Matrix E7 Intelligent Access Platform fills the gap between low functionality Layer 2 switches and expensive, complex routing solutions. The E7 provides comprehensive traffic control to desktop users or servers at the network edge, at a cost per port that is similar to many Layer 2-only switches. Key Matrix E7 advantages include:

- **Bandwidth Provisioning Per Port** — This unique feature enables service level agreements by directly assigning bandwidth to users and servers
- **Advanced Layer 2-4 Services** — Intelligent features such as Multilayer Frame Classification increase traffic control and are included at no additional charge. Competitive systems require expensive feature cards or router modules to achieve these levels of service
- **Lowest Price Per Port** — The Matrix E7 has by far the lowest price per port (10/100) on the market today for switches that offer Layer 3 and 4 services. The E7 price per port is even more affordable than many competitive Layer 2-only switches
- **Guaranteed Reliability and Scaling** — Distributed switching architecture has no single-point-of-failure, ensuring maximum uptime and scaling without degrading performance. Both of these benefits are not possible on competitive systems with centralized switching engines
- **Superior Connectivity** — By offering the widest selection of LAN and WAN interfaces, the Enterasys Matrix E7 is extremely versatile, enabling cost-effective technology migration
- **True Investment Protection** — The nTERA™ backplane design provides operability of previous, current and future generation connectivity modules. nTERA™ enables seamless deployment of next-generation optical technologies—including 10 Gigabit Ethernet and DWDM—without a costly forklift upgrade

## SAMPLE CONFIGURATIONS

### Deployment 1 – High-Performance Wiring Closets

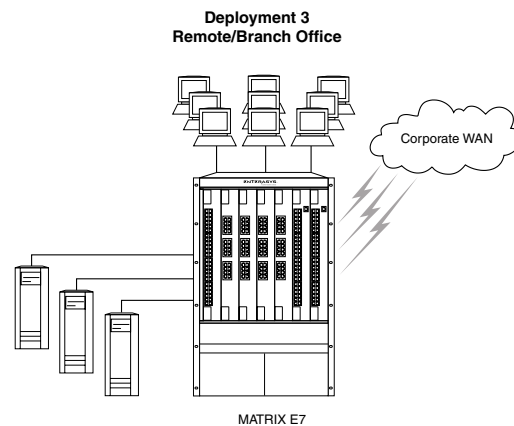
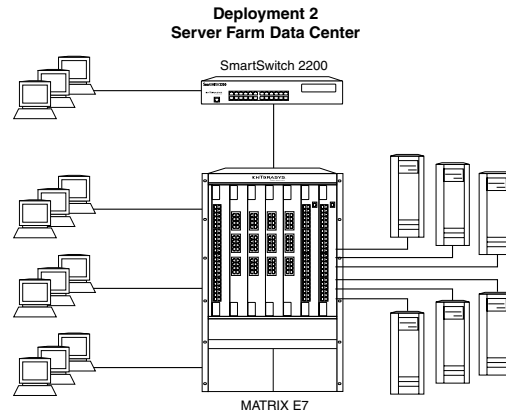
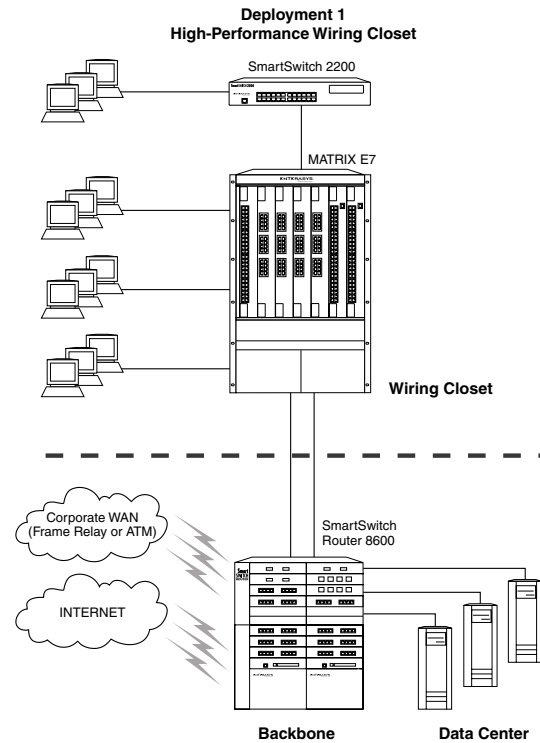
High-port density, superior throughput, support for multiple technologies and advanced Layer 2-4 traffic control make the Enterasys Matrix E7 ideal for aggregating traffic from shared hubs, MicroLAN switches and individual desktop users.

### Deployment 2 – Server Farm Data Centers

Distributed switching architecture with redundant processors and power supplies and hot-swappable components make the Matrix E7 extremely reliable—with no single point of failure. nTERA™ backplane preserves infrastructure investment by retaining full compatibility with previous, current and future technologies. Advanced ASICs with embedded Layer 2-4 services deliver comprehensive quality of service, security and traffic management to the network edge.

### Deployment 3 – Remote/Branch Office

Add the 6SSRM-02 Advanced Router Module (ARM) to deploy the Matrix E7 as a one-box solution for a remote or branch office. In this scenario, the E7 provides desktop and server connectivity. The Matrix E7 also delivers routed connectivity to the corporate WAN using serial WAN line cards in the ARM.



# specifications (ENTERASYS MATRIX E7)

The Matrix E7 intelligent access platform has the lowest cost per port, with built-in investment protection and easy migration paths to emerging technology.

- Modular, 7-slot platform
- 2 power supplies
- Supports up to 336 10/100 Ethernet ports (scalable to 500)
- Supports up to 42 Gigabit Ethernet ports (scalable to 80)

## Technical

### Fault Tolerance

Switch Fabric-Independent, hot-swappable modules  
nTERA Backplane-Passive Matrix  
Power Supplies- 1:1 Redundant, hot-swappable  
Fan Tray- Hot-Swappable

### Power System

AC Input Power (auto-sensing)  
100V to 125V, 16 Amps  
200V to 250V, 8 Amps  
Output Power-1200 Watts  
Heat Dissipation 6200 BTU/hr max.  
AC VA Rating -1810 AC VA max

### Backplane Capacity

nTERA-420 Gbps

### System LED Indicators

Power Supplies LEDs:  
Green-Power supply outputs are within regulation; power redundancy is available  
Yellow-Power supply outputs are within regulation, but power redundancy is not available  
Red-One or more of the power supply outputs are out of regulation  
Fan Tray LEDs:  
Green-Fans operating normally  
Red-Fan failure

### System MTBF

Predicted > 200,000 hrs.

### Standards Support

IEEE 802.1Q, 802.1D, 802.1p  
Ethernet:  
IEEE 802.3, 10Base-T, 10Base-FL  
Fast Ethernet:  
IEEE 802.3u, 100Base-TX, 100Base-FX  
Gigabit Ethernet:  
IEEE 802.3z, 1000Base-T  
FDDI:  
ANSI SMT X3.229 (Rev 7.3), ANSI MAC X3.139-1987, ANSI PHYX3.148-1988, ANSI PMD X3.166, ANSI TP-PMD T12/94, ANSI SMF-PMD X3.184, ANSI LCF-PMD X3.237  
ATM:  
DS-3, OC3c, OC12c, LANE 1.0/2.0, UNI 3.0/3.1/4.0

### Media Type Supported

Copper: RJ45, RJ21  
Fiber: SC, MT-RJ

### Standard MIB support

Path MTU Discovery (RFC 1190)  
SNMP MIB II (RFC 1213)  
FIB (RFC 1354)  
Bridge MIB (RFC 1493)

MIB II interfaces (RFC 1573)  
SONET MIB (RFC 1595)  
AToM MIB (RFC 2515)  
RMON MIB (RFC 1757)

### Management Access

SNMP, WebView, Telnet  
Serial RS232 COM port

## Physical

### Chassis Dimensions

30.5" H x 17.34" W x 14.5" D  
77.47 cm H x 44.04 cm W x 36.83 cm D

### Power Supply Dimensions

5.0" H x 8.27" W x 11.0" D  
12.7 cm H x 21.0 cm W x 27.94 cm D

### Module Dimensions

18.28" H x 2.38" W x 11.62" D  
46.4 cm H x 6.5 cm W x 29.5 cm D

### Weight

Empty chassis w/fan tray: 52 lbs. (23.6 kg)  
Power supply: 20 lbs. (9.1 kg)  
Average module: 4.5 lbs. (2.0 kg)

### Rack Unit Height

18 U

## Environmental

### Operating Temperature

5° to +40°C (41° to 104°F)

### Non-Operating Temperature

0° to +70°C (32° to 158°F)

### Operating Humidity

5 to 90% RH, non-condensing

## Agency and Standards

### Safety

UL1950  
CSA C22.2 No. 950  
EN60950  
IEC950  
72/73/EEC

### Electromagnetic Compatibility

FCC Part 15  
CSA C108.8  
EN55022  
VCCI V-3/93.01  
EN50082-1  
89/336/EEC

## Ordering Information

6C107

Enterasys E7 Chassis, 7 slots, w/ fan tray

6C207-1

Enterasys E7 Power Supply, 1200-watt (order two for redundancy)

6C407

Enterasys E7 Fan Tray, spare



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