

# New Enhanced UXM (UXM-E) ATM Module for the IGX 8400

Please be advised that we will begin phasing in a new enhanced UXM (UXM-E) asynchronous transfer mode (ATM) module for the IGX™ 8400. The UXM-E module provides certain enhancements as detailed in the UXM-E overview section below. The UXM-E module supports the same backcards (4/8-T1/E1, 3/6-T3/E3, 2/4-OC3/STM1E), uses the exact same firmware image, and can interwork with any UXM module. It is backwards compatible with SWSW Release 9.1.

The UXM-E module will become orderable in mid-November 1999 and shippable in volume in early to mid-December 1999. UXM-E bundles will be available, just like for UXM. The existing UXM module will continue to be orderable until April 15, 2000. If you have a customer interested in participating in the UXM-E beta testing prior to December, please contact Bernard Lee at berlee@cisco.com.

Customers sending in a UXM module as part of a Returned Merchandise Authorization (RMA) will receive a UXM module in return as long as supplies of the UXM last. When stocks of the older UXM modules are exhausted, the fully compatible UXM-E modules will be shipped instead. It is expected that UXM modules will be available through RMAs for approximately 5 years.

Cisco will provide ongoing bug fix support for the older UXM module for 5 years after the End of Service (EOS) announcement.

## UXM-E Overview

The UXM-E module includes the following key feature enhancements:

- *Increased QE threshold/statistics memory*—The threshold/statistics memory has been increased on the UXM-E module to support 8-K cons concurrently with Level 1 stats, 8-K cons with Level 2 stats, and 4-K cons with Level 3 stats.
- *Enhanced VI traffic shaping granularity*—The UXM-E module has been enhanced to provide finer VI traffic shaping granularity than was available on the UXM module. The UXM-E module can support any traffic shaping rate which can be expressed with a 9-bit mantissa and a 4-bit exponent. In particular, this allows much finer granularity for low-speed VIs than was previously possible.
- *Enhanced available bit rate (ABR) support for connections with non-ATM adaptation layer 5 (AAL5) traffic*—The UXM-E module has been enhanced to minimize the risk of RM cell starvation on available bit rate (ABR) connections. The enhancement consists of managing the ingress queue to ensure that RM cells can be placed in the queue, and thereby safely delivered to their destination, even when the queue is full during times of network congestion.
- *Support unidirectional ForeSight connections*—On the UXM module, support of ForeSight ABR (the Cisco pre-standard ABR implementation) is limited to permanent virtual circuit (PVCs) with bi-directional traffic flow only. The UXM-E module is enhanced to support ForeSight ABR on PVCs with uni-directional traffic flow as well.

The UXM-E, like the UXM, also supports ATM Forum standard ABR for PVCs with either bi-directional or uni-directional traffic flow.

- *Enhanced VS/VD between ForeSight ABR segment and ATM Forum standard ABR segment*—The UXM-E module is enhanced to provide VS/VD coupling between ATM Forum ABR (on the “port” or “external” segment) and ForeSight ABR (on the “network” or “internal” segment).
- *Optimize channel allocation*—The UXM-E module is enhanced to allow 8-k user connections in either trunk, port, or mixed mode. This is accomplished by optimizing the way that internal channels are allocated to support processor-to-processor communications.

The UXM-E module also includes the following features that can be enabled by the firmware and the switch software in the future:

- *Support separate frame discard CLP0 and frame discard CLP1 thresholds for each Class-of-Service (CoS) queue*—The UXM-E module supports separate frame discard CLP0 and frame discard CLP1 thresholds for each CoS queue. This feature enables preferential treatment for conforming traffic within CIR (frames with CLP=1 start-of-frame cell) compared to non-conforming traffic (frames with CLP=0 start-of-frame cell) when applying early packet discard (EPD).
- *Support the merging of multiple frame-based VCs onto a single frame-based VC with future software upgrade*—The UXM-E hardware will support VC merge to facilitate tag switching with simple, future software upgrade. With VC merge, the UXM-E module allows the IGX to aggregate multiple incoming frame based VCs with the same destination address into a single outgoing frame-based VC. Cells from different VCs going to the same destination are transmitted to the same outgoing VC using multipoint-to-point connections. Where VC merge occurs, several incoming tags indicated by VCs are mapped to one single outgoing tags. This sharing of tags reduces the total number of virtual circuits required for tag switching. Without VC merge, each source-destination prefix pair consumes one tag VC on each interface along the path. VC merge reduces the tag space shortage by sharing tags for different flows with the same destination.



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