TeraStream™ Chip Set (VSC871 & VSC881)

OC-192 Intelligent Switch Fabric

Product Brief

Switch Fabric Family

Highlights:

- Highly-Integrated, Two-Chip Set for Reduced Implementation Cost
  - Integrated Queuing and Scheduling
  - Integrated SerDes
- Single-Stage Aggregate User Bandwidth of up to 160Gb/s
  - Full duplex ports configurable for 2.5Gb/s or 10Gb/s
  - 2x backplane speedup
- Maximum Configurations of up to 16x16 OC-192, 64x64 OC-48, or any Combination of OC-192/OC-48
- Sophisticated QoS
  - 16 Classes of Traffic
  - Advanced Unicast and Multicast Support
  - Virtual Output Queues (VOQs)
- High Availability with Zero Loss of Traffic During Redundant Switchover
  - Integrated Redundant SerDes for 1+1 Redundancy
- Field-proven, High-Speed Serial Link (HSSL) Technology

TERAStream

General Description

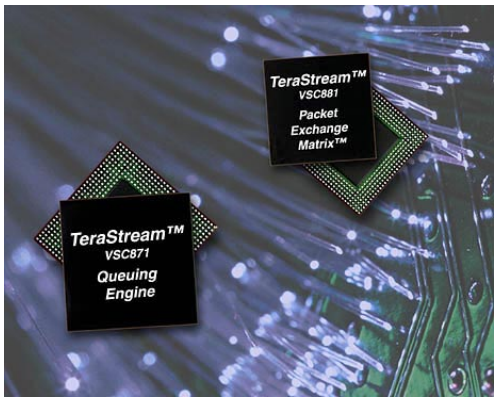
The TeraStream™ product is a third generation Intelligent Switch Fabric using Vitesse's proven high-speed serial link technology. This product consists of the VSC871 Queuing Engine and the VSC881 Packet Exchange Matrix™, and supports aggregate user bandwidths of up to 160Gb/s with port speeds reaching 10Gb/s.

High Integration Reduces Overall Cost

Manufactured on a 0.18µm CMOS process, the TeraStream chip set integrates advanced queuing and scheduling, a synchronous serial crossbar, and multiple SerDes in a dual-chip fabric architecture. The TeraStream fabric is a low-power solution that consumes only 1.4W per Gb/s with the capability of powering-down unused serial links. Transmission between each line card and one or more switch cards is conducted entirely in-band via the integrated SerDes. This results in a high-performance, cost-effective switch fabric with a low overall chip count to minimize power, design complexity and board space requirements.

High Performance and Scalability

The TeraStream Packet Exchange Matrix supports 32x32 high-speed, self-clocking serial links, each operating at a maximum user data rate of 2.5Gb/s. Multiple chips can be combined to increase the overall port bandwidths to support dense system configurations such as 64x64 OC-48 and 16x16 OC-192. In addition, the



TeraStream switch fabric protects the user's line card investment with a seamless upgrade option to future members of the TeraStream family of switch fabrics.

Efficient Bandwidth Utilization

The TeraStream solution is a self-routing switch fabric with logical backplane link rates at twice the user port bandwidths (2X speedup), Virtual Output Queuing (VOQ), and sophisticated Quality of Service (QoS) mechanisms to ensure non-blocking performance. The fabric supports both unicast and multicast traffic, each with 16 discrete classes of traffic partitioned between strict priority and weighted bandwidth allocation. To eliminate head-of-line blocking, the TeraStream Queuing Engine contains VOQ planes assignable to individual output ports. For multicast traffic, replication is performed in the TeraStream Packet Exchange Matrix to optimize ingress link bandwidth utilization.

High Availability

The TeraStream switch fabric offers several features designed to simplify in-situ replacement or upgrades, including

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Applications:

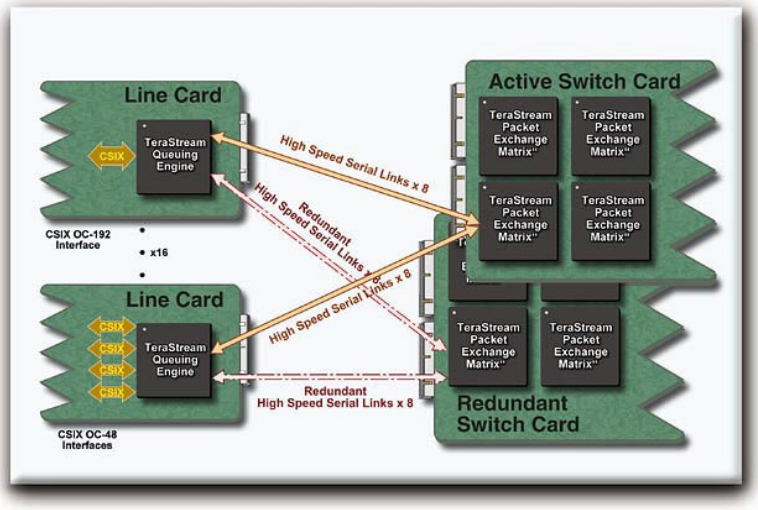
TeraStream can be used in many applications, including:

- Access and Aggregation Routers
- Remote Access Boxes
- Optical Edge Platforms
- Core Routers
- Metropolitan Networks
- Optical Networking

TeraStream can support a variety of protocols, including:

- IP
- ATM
- GbE and 10GbE
- MPLS
- Fibre Channel
- Frame Relay
- Mixed IP/ATM/GbE/FC

both hardware and software switchover for field maintenance or link failure conditions. The fabric employs fail-safe, hot-swappable buffers that permit line cards to be removed or inserted into a live backplane without damage. To assist in error detection, each Queuing Engine's primary and integrated redundant serial links have independent self-synchronizing link circuitry and link health monitoring. In addition, the 1+1 redundant switch core protection scheme has end-to-end error protection and a mechanism for maintaining resources during faulty conditions, ensuring zero loss of traffic and continuous operation.



Proven Technology Minimizes Risk

The TeraStream Switch Fabric uses proven high-speed serial link technology to communicate between the TeraStream Queuing Engine and the TeraStream Packet Exchange Matrix, leveraging Vitesse's experience in real-world, high-speed semiconductor transceiver technology. TeraStream can interface with Vitesse's or any CSIX-compatible, third party traffic manager or network processor. Application notes, reference system design documentation, and experienced support teams are available to accelerate development times and ensure first-pass system success. Few variables are left to chance in the end-user environment.

Specifications:

Description	VSC871 Queuing Engine	VSC881 Packet Exchange Matrix
Process Technology	0.18µm CMOS	0.18µm CMOS
Package Information	784 TBGA	520 TBGA
Maximum Power Dissipation	12W	15W
Core Supply Voltage	1.8V	1.8V
I/O Supply Voltage	2.5V or 3.3V	2.5V or 3.3V
Temperature Range	0 - 85°C	0 - 85°C
Serial Link Speed	2.125 - 2.644Gb/s	2.125 - 2.644Gb/s
High-Speed Serial Channels	8 active + 8 redundant	32

For more information on Vitesse Products visit the Vitesse web site at www.vitesse.com or contact Vitesse Sales at (800) VITESSE or sales@vitesse.com

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