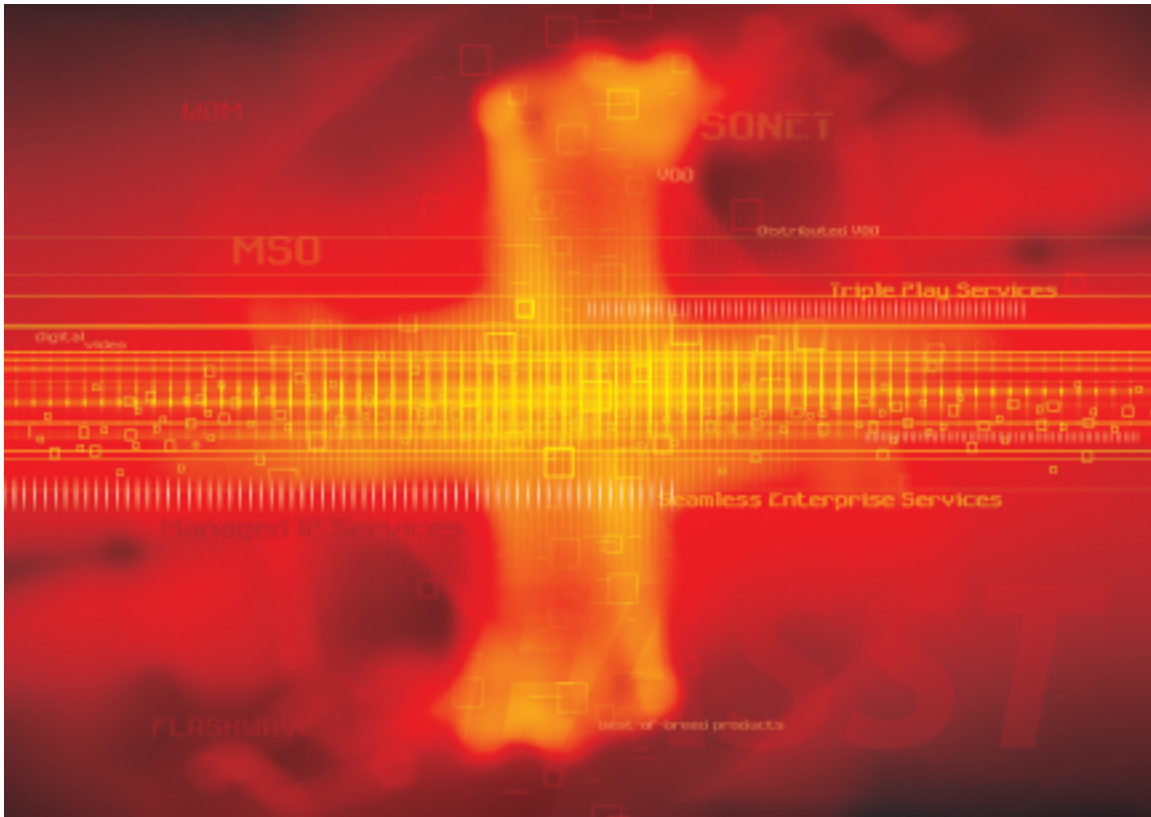


Transition Without Compromise



**New FASST™ Applications Enable Carriers to
Non-Disruptively Transform Their Service Portfolios**

Introduction

Service providers and MSOs wish to transition to an efficient packet infrastructure capable of delivering new business and broadband services while leveraging their installed infrastructure and advanced Optical Ethernet technology. These carriers are finding this task impossible with products currently offered by traditional IP vendors. To satisfy this growing solution gap, Fujitsu has partnered with innovative companies, including Atrica®, CoSine Communications® and Hammerhead™ Systems, to create the Flexible Architecture for Subscriber Service Termination, or FASST™, solution portfolio.

FASST is an architecture and solution suite optimized for transition management. This unique partnership enables service providers to manage the many critical transitions they must execute, while mitigating risk, leveraging their multi-billion dollar investments in SONET, ATM, Frame Relay, IP, MPLS and OSS products, and taking advantage of advanced Optical Ethernet technology. Central to these transitions is the shift to more profitable service delivery models that enable a broad range of differentiable carrier class Ethernet services, managed IP services and advanced Triple Play, along with the migration of existing corporate data services (e.g., Frame Relay, ATM and Ethernet) to a converged core network based on MPLS.

Enterprise-focused applications supported by FASST include VoIP, secure Internet access, TLS, Frame Relay/ATM services, advanced video services, SAN and business continuity. Advanced Triple Play consumer-oriented services, including dynamic activation of mass-market high-quality video broadcasting, VOD, IP video, IP telephony, SLA-based Internet access and other broadband services, can be offered to individual subscribers, no matter how, when, or where they access the network.

These initial offerings are based on SONET and WDM solutions from Fujitsu, carrier-class Optical Ethernet solutions from Atrica, network-based Managed IP services and Advanced Subscriber Management (ASM) solutions from CoSine, and Migration Edge solutions from Hammerhead. The FASST solution suite enables service providers to differentiate themselves with fully tested and complementary technologies. Carriers can easily manipulate the service attributes offered by FASST in order to set themselves apart from their competition.



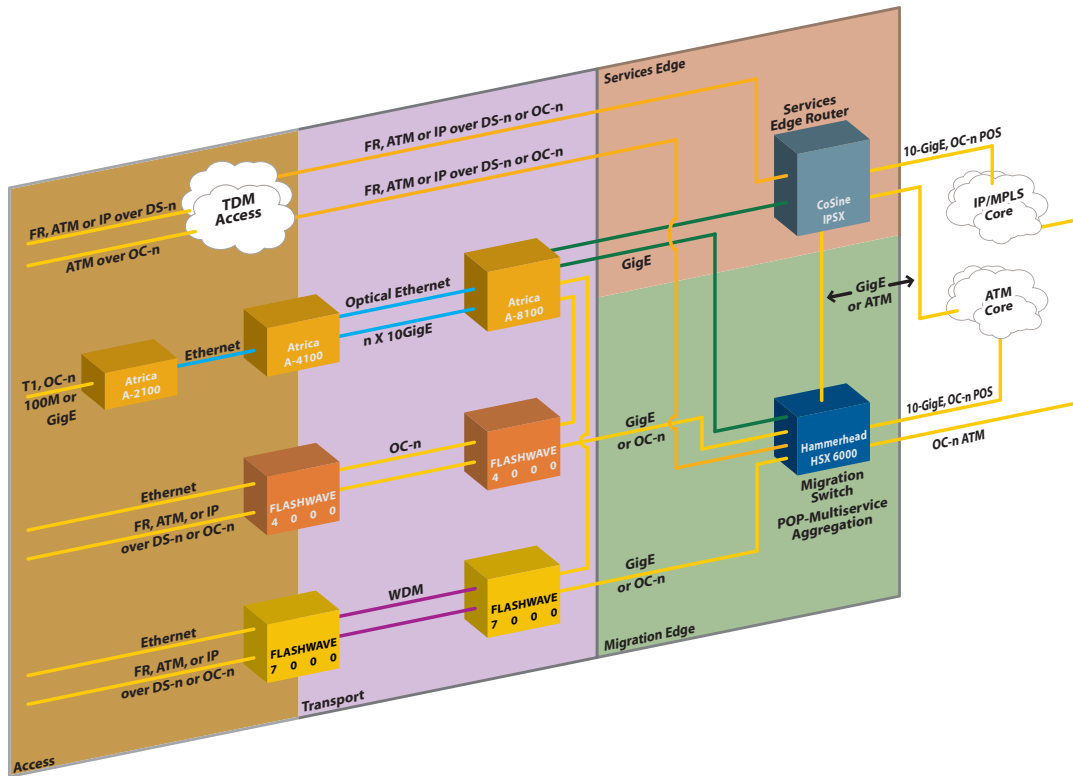


Figure 1: FASST Architecture Enables Transition Without Compromise

Seamless Enterprise Services

FASST enables service providers to achieve two simultaneous objectives. First, FASST extends the life and boosts the margins of high-revenue services, such as Frame Relay and private lines, by infusing new value and slashing costs. Second, FASST expands the revenue streams from emerging IP, Ethernet and Triple Play services by adding the robust scalability and clear differentiation needed to win mass-market penetration.

With FASST, carriers can mix and match any combination of traditional and emerging access, Layer 2 services, and Layer 3 services, while expanding value, lowering cost, and easing transitions across their entire services portfolio. Carriers can meet pent-up demand via FASST’s virtually unlimited, seamless bundling options that allow enterprises to leverage the latest technological advances across all of the carrier’s Layer 1/2/3 services without being forced to upgrade all of their sites. Additionally, carriers can transition services to run over a new infrastructure (e.g., from an ATM core to an IP/MPLS core) while still offering the same services to the customer.



For example, a service provider can now expand their service portfolio by creating carrier-class Ethernet services with unique SLA characteristics, including CIR, EIR and 50ms protection, in addition to existing TDM private line, Frame Relay and ATM services. In this example, the service provider can now offer an Ethernet service with Frame Relay or ATM-like characteristics, a powerful new service that allows bandwidth-starved sites to affordably upgrade their Frame Relay or ATM service to broadband speeds, while gaining all the reliability and SLAs expected from any Frame Relay/ATM service, and by leveraging Ethernet/Frame Relay/ATM Layer 2 service interworking that eliminates the need to upgrade the rest of the customer's network.

Network-based Universal Remote Access IP service can connect all the laptops, PDAs and cell phones of remote and mobile workers to this customer's Frame Relay network under a consistent corporate-wide security policy. Internet and Extranet services can be activated at any of the customer's sites to provide secure one-link access. An MPLS-based VPN service can be activated at one of the sites to seamlessly interwork with the customer's enterprise services. The service provider can also transition the Frame Relay service onto a new MPLS core network to reduce costs without changing the customer's Frame Relay service or impacting any of their other services.

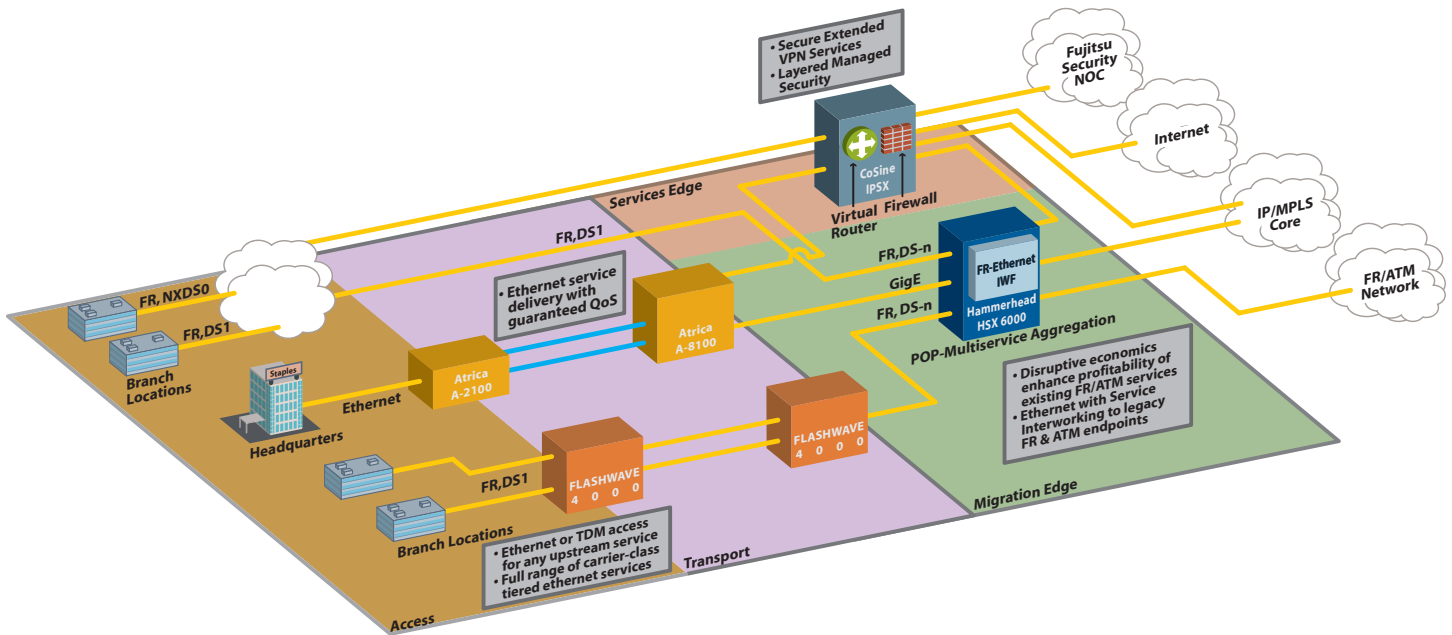


Figure 2: FASST Enables Transition and Creation of Enterprise Services



Triple Play Services

FASST enables carriers and cable operators to transform from a single-service-to-the-household model to the next-generation of broadband Triple Play services. Carriers and cable operators can now deliver a rich set of basic and premium offerings, including video sports tickers, hundreds of TV channels, PVR, VOD, voice and video telephony, and interactive gaming. In addition, these services can now be untethered to follow the person anywhere, using any form of broadband residential access, Wi-Fi hotspots or 3G mobile phone connections.

For their access networks, carriers can choose to implement Optical Ethernet for aggregation of users across DSL, PON or WLL broadband networks, while gaining the carrier-class reliability, QoS and SLA mechanisms needed to scale mass-market distribution of video content. Carriers can also choose to extend the life and lower the cost of their ATM-based broadband network with efficient ATM mass-market aggregation of users and delivery of new services and converged business services aggregation. ASM dynamically activates all Triple Play services to the individual, anywhere and anytime, no matter which technology is used in the access network.

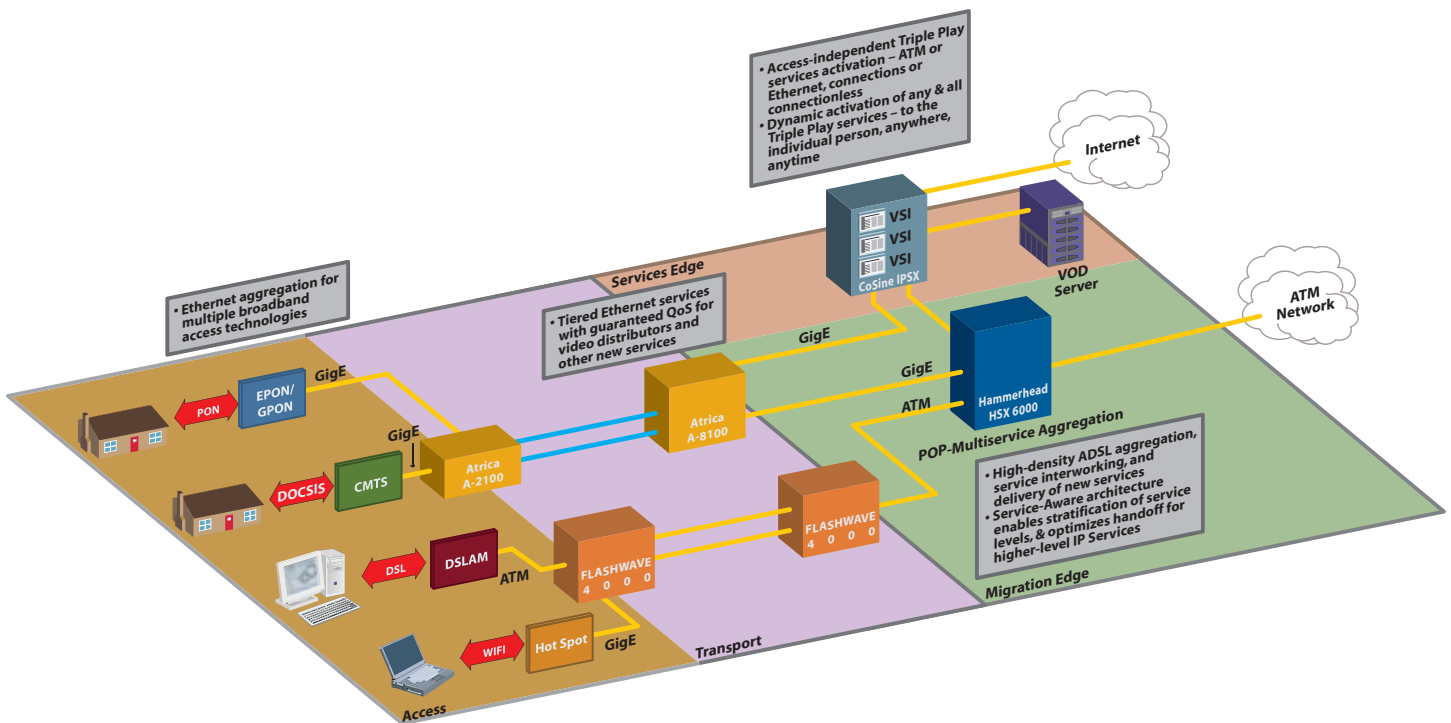


Figure 3: FASST Enables Seamless Broadband Triple Play Services for Residential Subscribers

Technology Enablers for These Services

With FASST, service providers can exploit best-of-breed products and technologies from Atrica, Fujitsu, Hammerhead and CoSine for specific applications, as well as leverage the portfolio's unique synergies. Carriers can now transform their fragmented and undifferentiated business services offerings, including Ethernet and private lines, Ethernet TLS, Frame Relay and ATM, broadband, and IP services, into a high value, seamless enterprise services portfolio for maximum ROI.

Atrica's Optical Ethernet family, consisting of the A-100 and A-2000 edge devices, A-4000 aggregation platforms and A-8000 core switching platforms, and ASPEN®, an integrated service provisioning and management system, delivers the broadest range of Ethernet services and carrier-class Ethernet reliability and provisioning, regardless of whether service providers build a new, standalone Optical Ethernet infrastructure or insert the products into an existing SONET network.

The Atrica platforms provide the industry's broadest range of carrier-class, QoS-enabled, tiered Ethernet services, scalable for mission-critical enterprise networks and mass-market consumer broadband, including Ethernet CES for point-to-point TDM services; SLA-backed E-Line services for point-to-point VPLL for an ISP's high-speed Internet link or connecting two mission-critical Enterprise sites for storage backup; E-LAN or TLS for LAN-to-LAN connectivity; and P2MP video broadcast services.

With Atrica's systems, carrier-class reliability can be introduced to Ethernet networks, with full support for the scalability, protection, 50 ms resiliency, and guaranteed SLAs for end to end service based on CIR, EIR, service provisioning and service management requirements demanded by today's service providers. Point-and-click provisioning and carrier-class OAM&P ease the integration with legacy applications and operating procedures. The Optical Ethernet platforms can be seamlessly integrated with a carrier's OSS infrastructure, MPLS core or existing optical core networks for metro interoffice applications. Fujitsu's carrier-class FLASHWAVE® family of SONET and WDM optical transport solutions enable carriers to build highly reliable, revenue-generating networks that deliver new, feature-rich service offerings. The FLASHWAVE platforms support scalable transport of all Layer 2 or Layer 3 services across large-scale carrier infrastructure and dedicated, private networks.

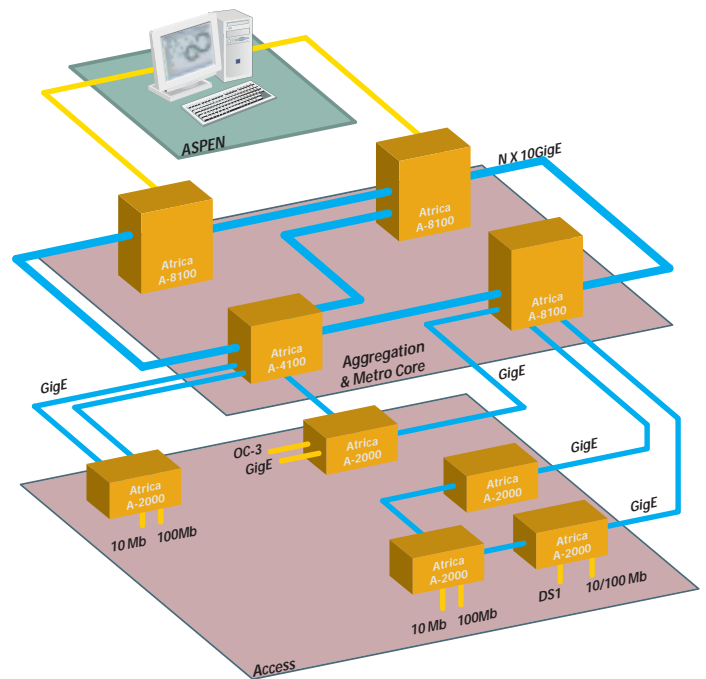


Figure 4: Atrica's Optical Ethernet Architecture

The widely deployed FLASHWAVE 4000 MSPPs are targeted for the converging telecommunications marketplace with transport of traditional TDM private line, Ethernet, Frame Relay, ATM, broadband video or any combination of these services over SONET. Full compatibility with the vast embedded SONET infrastructure deployed across North America ensures that new services can be introduced quickly with minimal impact on existing operating procedures and OSSs.

The next-generation FLASHWAVE 7000 WDM platforms deliver highly scalable network bandwidth for access, metro, regional, long haul and ultra long haul, high capacity solutions. The systems support a wide variety of popular services, including disaster recovery, business continuity and transparent wavelength access.

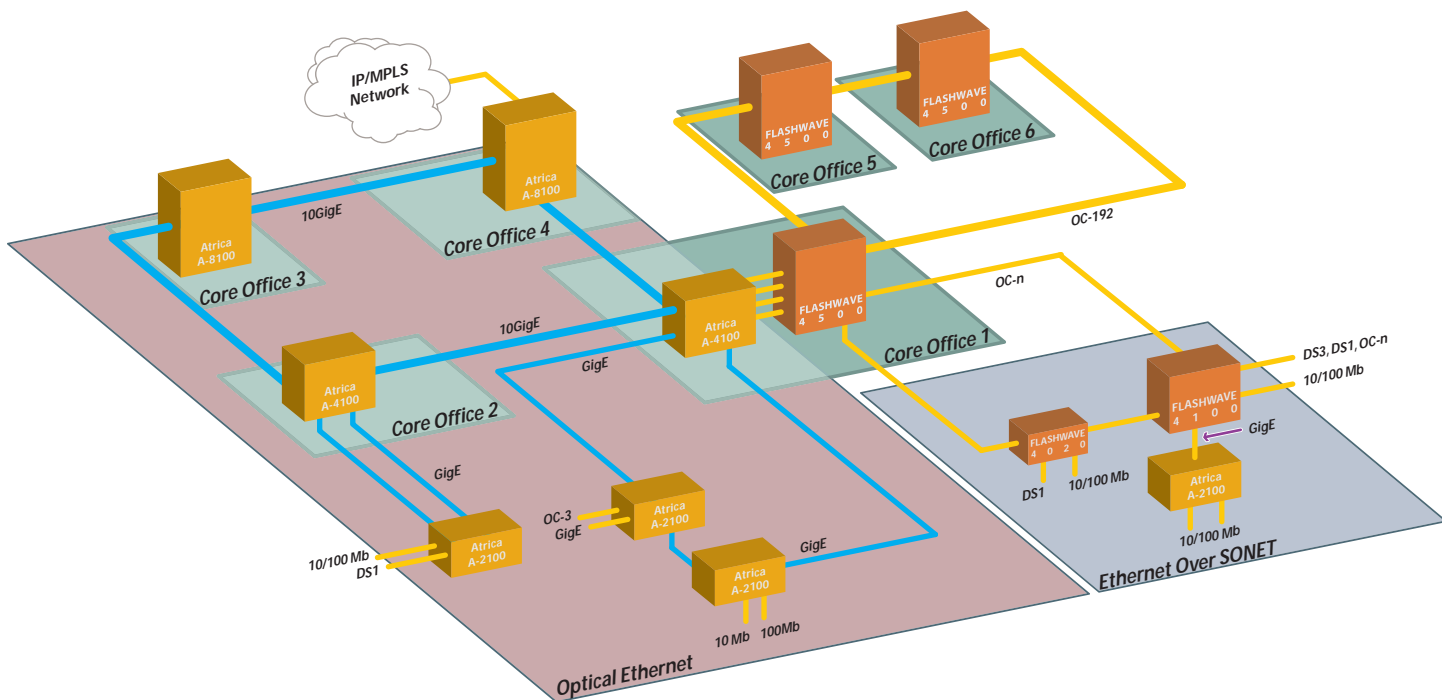


Figure 5: SONET and Optical Ethernet Offer Multiple Access and Transport Options



Hammerhead Systems has introduced the industry's first complete edge solution purpose-built for revenue migration. Hammerhead's HSX 6000™ Migration Edge Switch and the Pegador™ NMS enable service providers to migrate their \$20 billion Frame Relay and ATM revenues onto converged MPLS cores, while introducing Ethernet services with a profitable business model. Hammerhead brings long-awaited innovation and disruptive economics to the Layer 2 carrier infrastructure, providing a substantial improvement in density and a dramatic improvement in cost versus existing platforms. The HSX 6000 service-aware edge solution functions as a metering on-ramp, providing granular traffic management, prioritization and guarantees for successful data transport to facilitate the migration of premium service offerings, including content applications and other web-based applications, onto FASST networks.

The Hammerhead platform also supports scalable next-generation broadband services over access networks such as DSL or FTTP. The highly scalable Pegador NMS enables provisioning and connection management across legacy and Hammerhead endpoints, enabling service providers to minimize operational costs with flow-through provisioning, standard northbound interfaces for multi-vendor interoperability and robust FCAPS support.

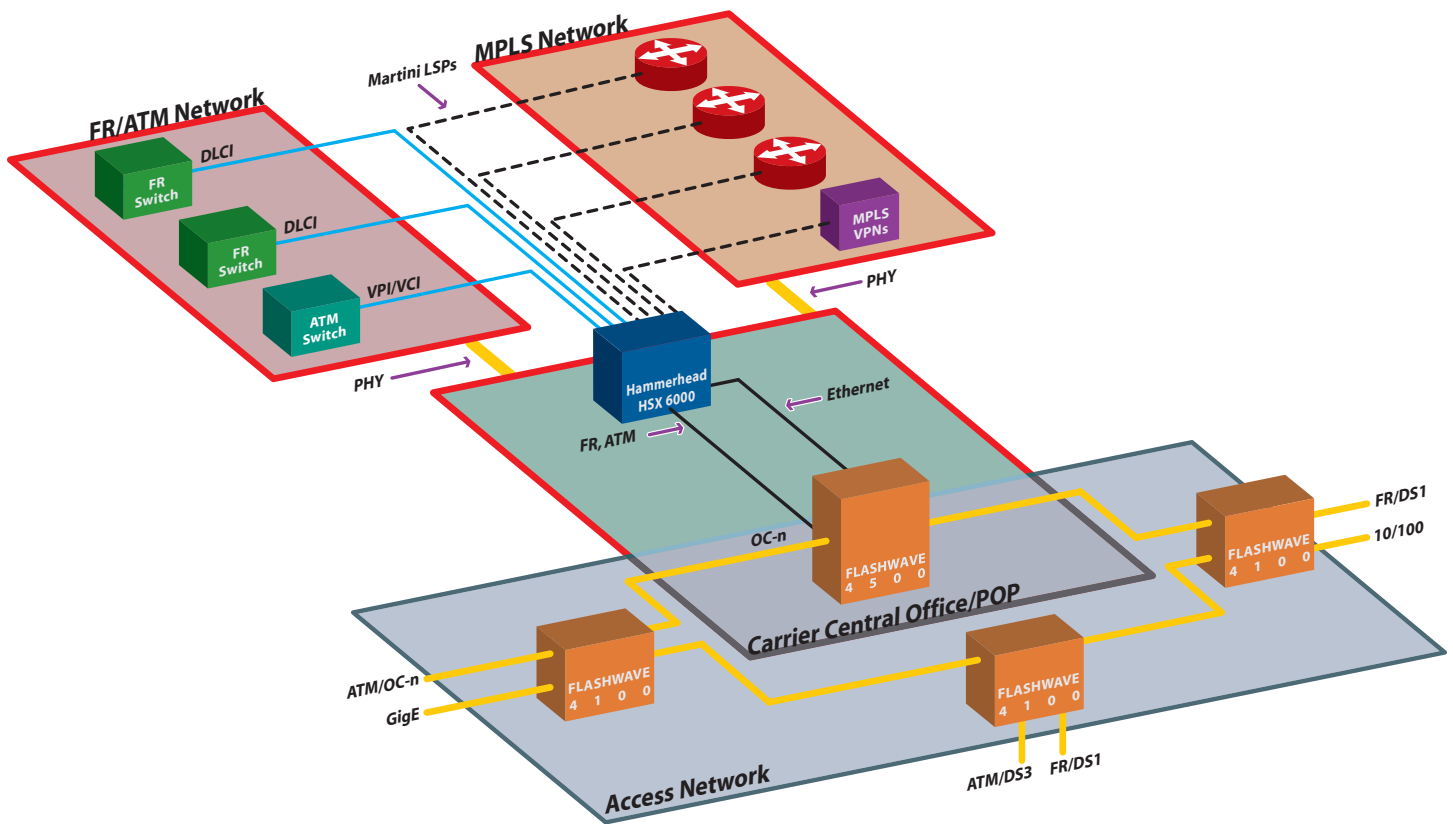


Figure 6: FASST Seamlessly Migrates Services from ATM Core Networks to a Converged IP/MPLS-based Core



CoSine's IP service delivery and ASM platforms deliver the industry's most scalable services processing layer on a single integrated platform. This functionality is critical to enabling FASST customers to deliver the broadest suite of IP services with the highest level of differentiation for a service provider's existing IP/MPLS edge, and to scale provisioning and delivery of services for thousands of enterprise networks.

The CoSine IPSX™ platforms support any service that can be created by combining features such as security, VPN, and multicast, to create universal remote access, broadband-enabled VPNs, integrated Internet access, Extranet services, and multicast VPNs. The IPSX architecture supports a broad range of innovative, differentiable, dynamically activated Triple Play services for hundreds of thousands of individual subscribers and enables them to be bundled by carriers and cable operators across all broadband access networks via ASM. These capabilities leverage the carriers' existing RADIUS-based policy infrastructure, requiring no forklift operational changes. InGage™ CNM software provides the end customer with deep visibility into its managed services.

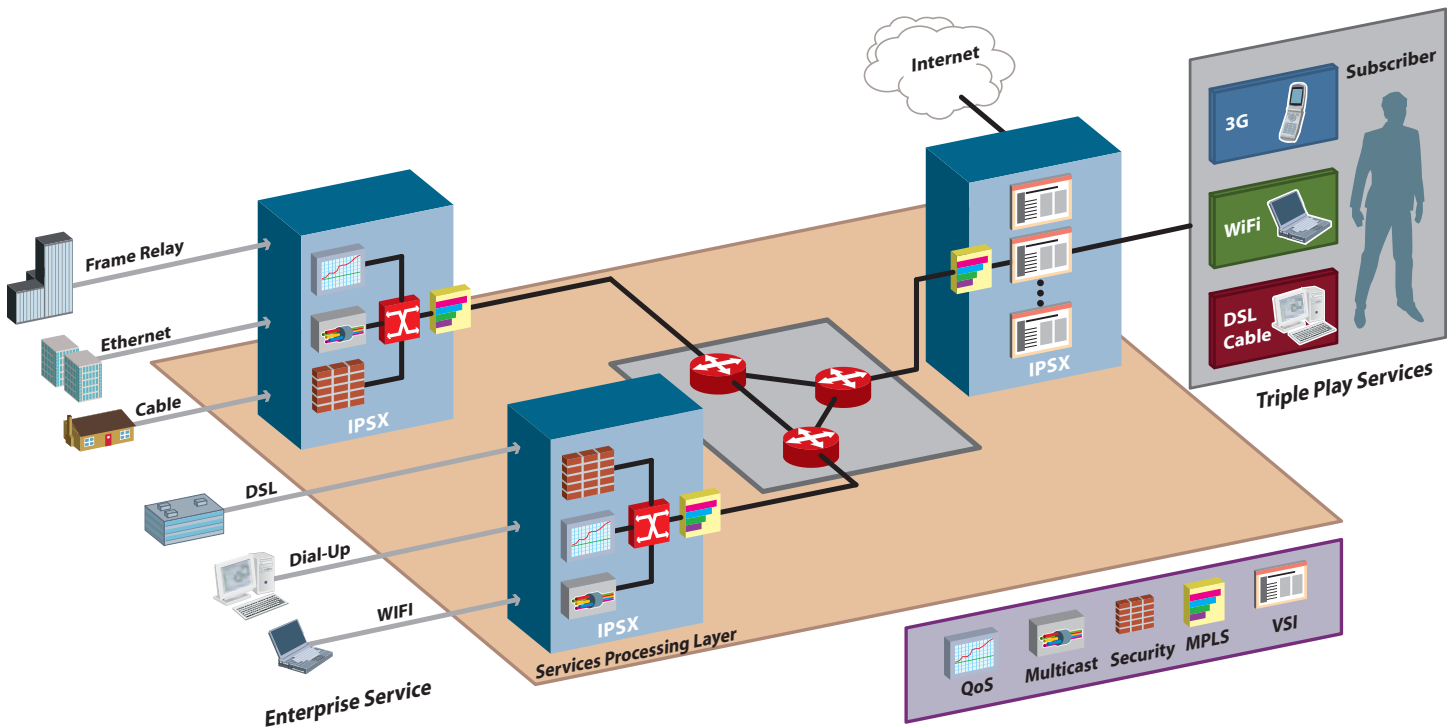


Figure 7: FASST Service Edge Architecture Enables Managed IP Services and ASM

Proven Experience and Quality Makes the Difference

Fujitsu brings to FASST a proven track record in helping large carriers smoothly execute some of the industry's most complex transitions, including the wholesale transition from Asynchronous to SONET transmission infrastructures, the addition of next-generation WDM networks and the associated speed increases from 150 Mbps to 1.76 Tbps capacities, while ensuring that business operations remain stable and uninterrupted. Fujitsu's unparalleled transition management and systems integration expertise is now being called upon to assist service providers with their latest critical transition without requiring forklift upgrades nor jeopardizing billions of dollars in core service revenue.

Fujitsu's world-class testing and certification process, applied across all FASST solution products, will ensure the highest levels of quality are met to speed the service provider's acceptance and deployment phase. Fujitsu's services group will leverage its multi-protocol (SONET, WDM, TDM, FR/ATM, IP, Ethernet and MPLS) and multi-vendor capabilities to provide network design, deployment, training and maintenance services across all FASST solution products, ensuring smooth transitions, speeding time-to-market and reducing operational costs. Tier One service support is also provided across all FASST solution products, giving the service provider an integrated support structure.

"Service providers need the best-of-both worlds – they want to exploit critically needed advanced technologies from innovative companies, but also seek partners who are of similarly large operational scale that can help them smoothly manage transitions within the tremendous size and scale of their operations. Fujitsu is clearly in the top tier of networking suppliers, not only a large player but one with the level of conservative financial management and the solid reputation for high quality that carriers are looking for in today's uncertain marketplace. The coupling of Fujitsu's operational experience with the progressive technologies supplied by the FASST alliance partners is a compelling transition-based approach that fits well with the needs of the North American market."

*– Michael Kennedy
Managing Partner
Network Strategy Partners, LLC*

About Fujitsu Network Communications Inc.

Fujitsu Network Communications Inc., a subsidiary of Tokyo-based Fujitsu Limited (TSE: 6702), is a leading provider of customer-focused IT and carrier-class telecommunications solutions for the Service Provider and Cable TV market in North America. Supported by smart innovation and deep-rooted research from Fujitsu Labs, Fujitsu is uniquely positioned to deliver fully integrated IT/Telecom solutions for its customers. The company's comprehensive consulting and customer services offer support at any network design, development, deployment and maintenance stage. For more news and information, please visit <http://us.fujitsu.com>.



About Atrica

Atrica's mission is to deliver the most cost-effective, high-performance Optical Ethernet solutions to forward thinking service providers that are building next-generation metro networks. Its revolutionary, Carrier-class Optical Ethernet Systems are designed to allow carriers to dramatically simplify their Metro network operations, significantly reduce their capital and operational expenditures, effectively scale their networks to support emerging Ethernet-based services, and efficiently leverage the same transport network to serve both business and residential customers. Privately held, Atrica is based in Santa Clara, Calif., with R&D facilities in Israel and business development and sales offices throughout the U.S., Europe, and Asia Pacific. The company has received a total of \$134 million in funding to date, from world-class venture capital firms, industry leaders, and seven global service providers. For more information, visit Atrica on the Web at www.atrica.com.



About CoSine Communications Inc.

CoSine Communications (NASDAQ: COSN) is a global telecommunications equipment supplier founded in 1998 to empower service providers to deliver a compelling portfolio of managed, network-based IP and Broadband services to consumers and business customers. From the edge of the network, several of the world's largest carriers use the CoSine platform to deliver customized and profitable network-based services to consumers and enterprises. For more information about CoSine Communications, visit the company's Web site at: www.cosinecom.com.



About Hammerhead Systems, Inc.

Hammerhead Systems, Inc. is the market leader in revenue migration solutions which enable service providers to migrate revenue as they transition their existing corporate data networks to consolidated, common MPLS backbones. Hammerhead has introduced the HSX 6000, the first purpose-built migration edge switch and the Pegador Network Management System, both generally available. The company is initially targeting the data services market, including the \$20 billion Frame Relay/ATM market—which represents the carriers' most profitable data services—along with the emerging Ethernet-based services market. Hammerhead has announced U.S. trials with a leading RBOC and a leading Network Service Provider. Hammerhead, located in Mountain View, Calif., is privately held, and has secured \$43 million in funding from Foundation Capital, Mayfield, Enterprise Partners, Pequot Ventures and Lighthouse Capital. For more information about Hammerhead, visit www.hammerheadsystems.com.



Acronyms	
ASM	Advanced Subscriber Management
ATM	Asynchronous Transfer Mode
CES	Circuit Emulation Services
CIR	Committed Information Rate
CNM	Customer Network Management
DSL	Digital Subscriber Line
EIR	Excess Information Rate
FASST	Flexible Architecture for Subscriber Service Termination
FCAPS	Fault, Configuration, Accounting, Performance and Security
FR	Frame Relay
FTTP	Fiber to the Premises
IP	Internet Protocol
LAN	Local Area Network
MPLS	MultiProtocol Label Switching
MSO	Multiple System Operators
MSPP	Multiservice Provisioning Platform
NMS	Network Management System
OAM&P	Operations, Administration, Maintenance and Provisioning
OSS	Operational Support System

Acronyms	
P2MP	Point-to-Multipoint
PDA	Personal Data Assistant
PON	Passive Optical Network
PVR	Personal Video Recorder
QoS	Quality of Service
ROI	Return on Investment
SAN	Storage Area Network
SLA	Service Level Agreement
SONET	Synchronous Optical Network
TDM	Time Division Multiplexing
TLS	Transparent LAN Service
VOD	Video-On-Demand
VoIP	Voice over Internet Protocol
VPLL	Virtual Private Leased Lines
VPN	Virtual Private Network
WDM	Wavelength Division Multiplexing
WLL	Wireless Local Loop

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