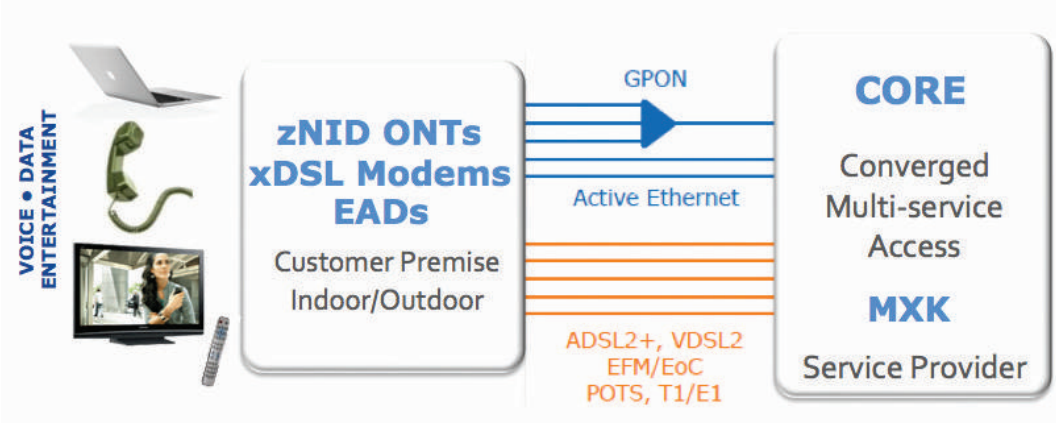
DZS

DASAN Zhone Solutions

PRODUCT BROCHURE

Bandwidth Changes Everything

Multi-Service Access



Providing the most complete solutions with advanced flexibility and clean migration from copper to fiber

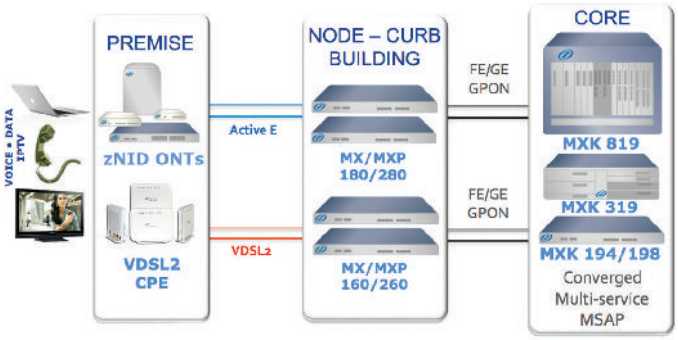
More than just a corporate tagline, “Bandwidth Changes Everything™” articulates DasanZhone’s corporate vision and product philosophy. It exemplifies DasanZhone’s investment in market-leading high-bandwidth solutions that help service providers monetize the burgeoning FTTx, Mobile Backhaul and Multi-Service access market opportunities and solves their last-mile and bandwidth bottleneck.

Today, we are witnessing continued momentum towards high-bandwidth connectivity over fixed broadband and wireless networks. Fixed networks are increasingly moving towards Ethernet and fiber last mile connectivity. Smart phones and tablets are powering users with anytime, anywhere access to information, communication and entertainment.

Fixed-line operators have placed a universal focus on enabling technologies like Gigabit Passive Optical Network (GPON), Active Ethernet (AE) and Very High Speed Digital Subscriber Line 2 (VDSL2) as they strive to achieve Fiber-to-the-Home (FTTH), Fiber-to-the-Node (FTTN), Fiber-to-the-Curb (FTTC) and Fiber-to-the-Building (FTTB) connectivity. At the same time, there’s an emerging emphasis on mobile backhaul by wireless operators as they develop and design the most advanced and converged networks for the future.

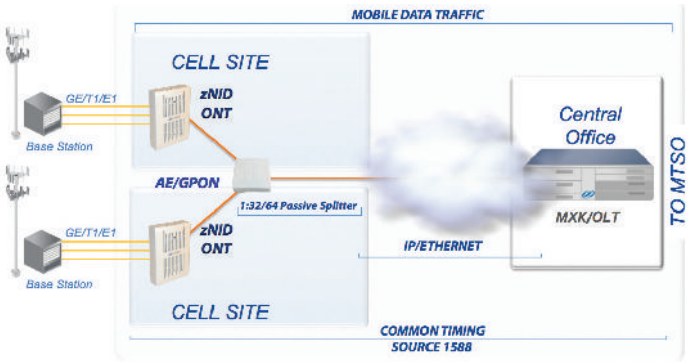
DasanZhone has long been a pioneer in the telecommunications industry with its broadband and multi-service access solution offerings. We are at the forefront of technology innovation today, with large-scale global deployments of our high-capacity multi-service solutions designed to provide cost effective enhanced performance solutions for each operator’s unique bandwidth requirements.

DasanZhone FiberHome



DasanZhone FiberHome™, an extension of DasanZhone's market-leading FTTx solutions, helps service providers enable high-speed broadband connectivity in places where broadband was not being extended. With this portfolio, DasanZhone is providing new FTTN, FTTC, FTTB and FTTP solutions to extend operators' last-mile reach with high-speed Copper to the Premise (CTTP) and wire-speed Ethernet to the Premise (ETTP) connectivity and enable advanced broadband and multi-play service delivery. The solutions available in the current DasanZhone FiberHome portfolio provide VDSL2 and Active Ethernet connectivity in the last mile in a 1U compact form factor to extend network reach and deliver cost-efficiency benefits that exceed those of competitive solutions.

DasanZhone FiberCell

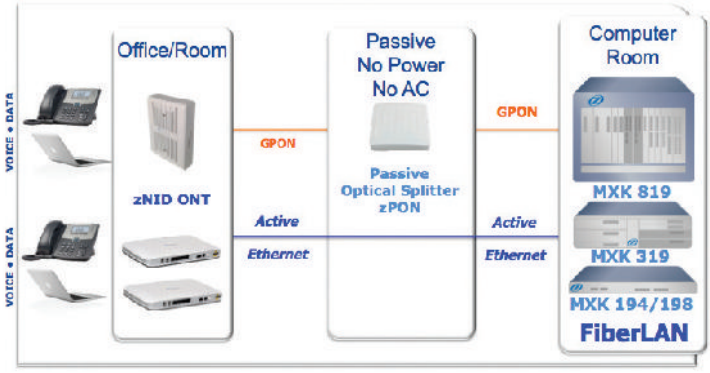


The DasanZhone FiberCell™ portfolio, also an extension of DasanZhone's market-leading FTTx solutions, is primarily designed to deliver cost-effective mobile backhaul upgrade solutions to customers. It's carrier-class solution is designed to address mobile operators' increased bandwidth needs in today's data-centric service environment.

DasanZhone FiberCell portfolio also features alternative backhaul options that give operators the flexibility to choose between copper and fiber, including Ethernet in the First Mile (EFM), GPON and AE. Operators using DasanZhone FiberCell solutions for mobile backhaul can anticipate a fast evolution to next generation 3G and 4G networks and services, including LTE.

DasanZhone FiberLAN

DasanZhone FiberLAN™ is a next generation Passive Optical LAN Solution (OLS) built entirely on industry leading standards. This fully converged solution is scalable for a single or multilevel buildings, or large campus environments where customers are installing new facilities or upgrading their current LAN infrastructures



Designed as a layer 2 transport medium, DasanZhone FiberLAN delivers converged voice, video, and data services, at Gigabit levels to the end user, over a single strand of fiber; thus reducing your LAN infrastructure cabling and electronics to a fraction of what is required compared to a conventional Ethernet LAN solution.

As technology advances, so do ways to conserve energy and reduce operating costs. FiberLAN Optical technology replaces conventional copper and multimode cables used with traditional network infrastructures to a single mode fiber optic cable allowing you to eliminate the traditional workgroup switches, patch panels, and racks in the riser closets.

Optical LAN Density Benefits

A Real-World Comparison

Less than Half of ONE Equipment Rack

Zhone Passive Optical LAN
819 and 198 OLT's

77,824 Ethernet ports

Assumes 64 splits per GPON Port

18 Equipment Racks

Active Ethernet
Up to 2,016 end users

Building Blocks to Delivering Triple Play Services

At the core of any solution for residential or business service is the broadband access network. DasanZhone products deliver a diverse range of fiber and copper capabilities in a single converged solution. The MXK Multi-Service Terabit Access solution helps set the foundation for enhanced service delivery by providing the optimal solution from the edge to the core of an operator's network.

To begin with, an operator can seamlessly provision **high-speed data** over any access medium, including wireless, copper or fiber, while delivering high-performance all-IP access designed specifically for today's traffic. The MXK, in combination with zNID ONTs, provide solutions for the core and edge points of the network while providing high-speed data solutions for FTTx deployments. Ultimately, **MXK is the cornerstone for FTTx**, a singular platform supporting FTTH, FTTN, FTTC and FTTB solutions.

When it comes to **voice transmission and interoperability**, the operator can subsequently overlay IP voice service. DasanZhone's MXK will interoperate with any softswitch that the operator chooses to provide converged voice and data service, over any access medium. Services like Class 5 Local, Class 4 Long Distance, PSTN Emulation, NGN and VoBB can all be enabled seamlessly over the same network.

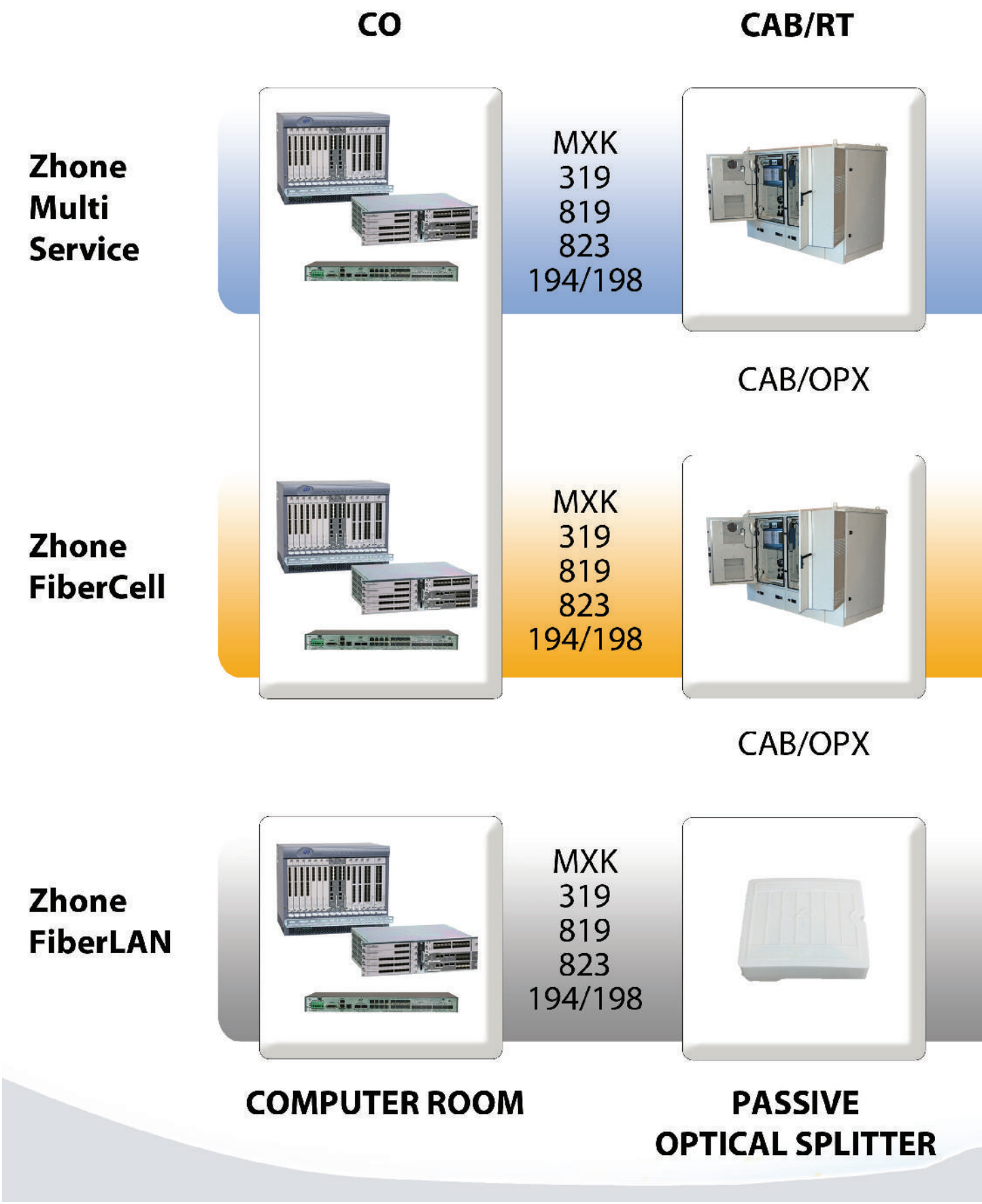
Multimedia, entertainment and IPTV has evolved to be some of the more exciting and challenging services to deploy. DasanZhone enables operators to effectively build the foundation for their next-generation interactive communication networks. An operator can effectively overlay IPTV and Entertainment service to provide a converged voice, data and entertainment service over any access medium. DasanZhone's products and solutions have been tested for interoperability with a diverse range of video systems from some of the leading IPTV solution vendors.

Multi-Service Access Node (MSAN)

The ability to seamlessly provide integrated broadband data, voice and vi heir CAPEX and OPEX needs. Their goals are to ensure cost-effective, but high-quality and differentiated, service.

In 2003, DasanZhone pioneered the first commercially available packet-based MSAN. Since then, DasanZhone has enhanced and optimized the solution to seamlessly integrate and support multiple access technologies over multiple access mediums on a single system. Today, DasanZhone is amongst the industry leaders for integrated support of next-generation broadband access technologies like ADLS2+, VDSL2, GPON and Active Ethernet on the same MSAN system, thereby minimizing the CAPEX spend and reducing operational cost and complexity.

In mid-2009, DasanZhone introduced its flagship MXK platform providing the industry's leading density, throughput and switching capacity. **MXK is the industry's first Terabit Access Concentrator** and is already being used by hundreds of customers globally today. A single MXK system can support end-to-end voice, data, entertainment, social media, business, mobile backhaul and mobility services to satisfy operators' connectivity and bandwidth requirements and build the **NETWORK OF THE FUTURE… TODAY!**


CO
CAB/RT
Zhone
Multi
Service
MXK
319
819
823
194/198
CAB/OPX
Zhone
FiberCell
MXK
319
819
823
194/198
CAB/OPX
Zhone
FiberLAN
MXK
319
819
823
194/198
COMPUTER ROOM
PASSIVE
OPTICAL SPLITTER

NODE/CURB/BLDG

PREMISES

XP/MX/MXP

MXK 194/198

zNID ONT
AE/GPON

ADSL2+
VDSL2,
EFM/EoC, POTS
T1/E1, ISDN

zNID ONT
AE/GPON

zNID
FiberJACK
ONT

zNID ONT
AE/GPON

zNID
FiberJACK
ONT

ZMS

**ZHONE
UNIFIED
PROVISIONING**

**GPON
ACTIVE
ETHERNET**

	MXK 823/819	MXK 319	MXK 194/198
Physical			
Configuration	Chassis	Chassis	Fixed 1U
Size	8U x 19 or 23" rack	3U x 19" rack	1U x 19"
Power	-48V DC	-48V DC	-48V DC
Uplink Slots	2	2	N/A
Line Card Slots	18/14	7	N/A
Ambient Temperature	-40C to +65C	-40C to +65C	-40C to +65C
Card Replace	Hot Swap	Hot Swap	N/A
Uplinks			
10 Gig.E	•	•	•
Gig.E	•	•	•
EAPS	•	•	•
LAGG / LACP	•	•	•
MSTP	•	•	•
Management			
DZMS/CLI	•	•	•
Web GUI	•	•	•
Unified Provisioning	•	•	•
Access/Line Cards (subs)	**MXK 823/819**	**MXK 319**	**MXK 194/198**
TDM / Copper			
POTS	72–1296/1008	72-504	N/A
POTS/ADSL2+	48–384/288	48-144	N/A
POTS/VDSL2	24-432/336	24-168	N/A
T1/E1 PWE	24-432/336	24-168	N/A
DSL / Copper			
ADSL2+	ADSL2+ 48-1296/1008	ADSL2+ 48-504	N/A
ADSL2+ W/ splitters	48–384/288	48-144	N/A
VDSL2	24–432/336	24-168	N/A
VDSL2 W/ splitters	24–432/336	24-168	N/A
EFM / Copper			
T1/E1 EFM	24–432/336	24-168	N/A
EFM G.SHDSL	24–432/336	24-168	N/A
Fiber			
GPON-4*	256-4608/3584	256-1792	256
GPON-8*	512-9216/7168	512-3584	512
Active Ethernet	20-360/280	20-140	N/A
OC OC-3/ STM-1 PWE	2-36/28	2-14	N/A
***Assumes 64-splits**			

MXK MSAN

DasanZhone's MXK™ is a fully redundant, carrier-grade all-IP platform enabling multi-service terabit access solutions from the edge to the core of a service provider's network, with seamless and integrated support for multiple technologies including GPON, Active Ethernet, VDSL2, ADSL2+, EFM, PWE and POTS. Additionally the MXK supports a comprehensive range of voice protocols including SIP, MGCP and H.248. The system is designed for high scalability, flexibility, and performance.

Built on 480 Gbps pure IP core switching and 4.6 Terabit total system switching capacity, the MXK system can cost-effectively scale from as few as 24 subscribers for small, remote or in-building deployments to over 9,200 subscribers in a single MXK system chassis and over 46,000 subscribers in a single MXK system rack. The MXK platform, with its standard-based interfaces, has been designed to provide a fully converged multi-service solution to help maximize the ROI for the service provider. The MXK system provides superior network intelligence and security with proven SLMS access operating system software.

Furthermore, the MXK was proven as a leading performer at both FSAN and Plugfest testing and interoperability events. In fact, DasanZhone leads the industry in GPON density per rack, chassis and blade! When combined with DasanZhone's DZMS network management platform, the solution provides the fastest and highest quality all-IP multi-service solution in the industry.

Operators are utilizing DasanZhone products and solutions to provision their residential and business services globally. DasanZhone customers deploying the MXK Terabit Access solution are convinced that they are protected for the future as the MXK solution has been designed to support the exponentially growing levels of personalized unicast traffic in the service provider's network. With fully redundant, dual-star 20 Gbps connections to every slot in the chassis, DasanZhone's MXK provides unmatched non-blocking bandwidth for the burgeoning social media interactivity.

MALC

DasanZhone's MALC™ is a full-featured multi-service access platform optimized to deliver voice, data, and video services over a pure packet access network. Service providers have the flexibility to provision services over their existing network and later migrate to a pure packet network without disrupting subscriber service. Deployed in the Central Office, Remote Terminal, outdoor cabinets or basements, the MALC offers a range of chassis options supporting densities from 24 to 960 ports per shelf. MALC enables service providers to deploy a wide variety of business and residential services in a single platform with support for technologies and protocols like ADSL2+, ReachDSL, SHDSL, POTS, ISDN, T1/E1, PWE, SIP, MGCP and H.248.

The MALC chassis, with its fault tolerant control software and redundant uplink hardware design, increases the resiliency and the scalability of the product. It also offers Resilient Packet Ring (RPR) over Gigabit Ethernet to increase system reliability, and a range of services- including T1/E1 ATM (UNI and IMA) and T1/E1 TDM (GR.303 and V5.2) - allow carriers to maintain existing TDM services while simultaneously retooling for VoIP services using SIP, MGCP or H.248 signaling. Moreover, DasanZhone's integrated ADSL+POTS technology eliminates cut-overs and truck rolls by allowing carriers to provision broadband or narrowband services remotely.

Line Cards (subs)	MALC 723/719	MALC 319
TDM / Copper		
POTS	48–912/720	48–384
POTS/ADSL2+	48–432/384	48–192
ISDN	24–432/384	24–192
T1/E1 PWE	24–432/384	24–192
DSL / Copper		
ADSL2+	48–960/768	48–384
ADSL2+ with splitters	48–432/384	48–192
G.SHDSL 2 wire	12–960/768	12–384
Ethernet / Copper		
EFM T1/E1 PKT	24–480/384	24–192
EFM G.SHDSL	24–480/384	24–192

MALC 723/719/319	
Physical	
Configuration	Chassis
Size	7U x 19 or 23" rack 3U x 19" rack
Power	-48V DC
Power Options	NA
Uplink Slots	2
Line Card Slots	19/15/8
Ambient Temperature	-40C to +65C
Card Replace	Hot Swap
Uplinks	
FE/GE	•
FE/GE RPR	•
Management	
RADIUS	•
DZMS/CLI	•
Web GUI	•

Optical Line Terminal (OLT)

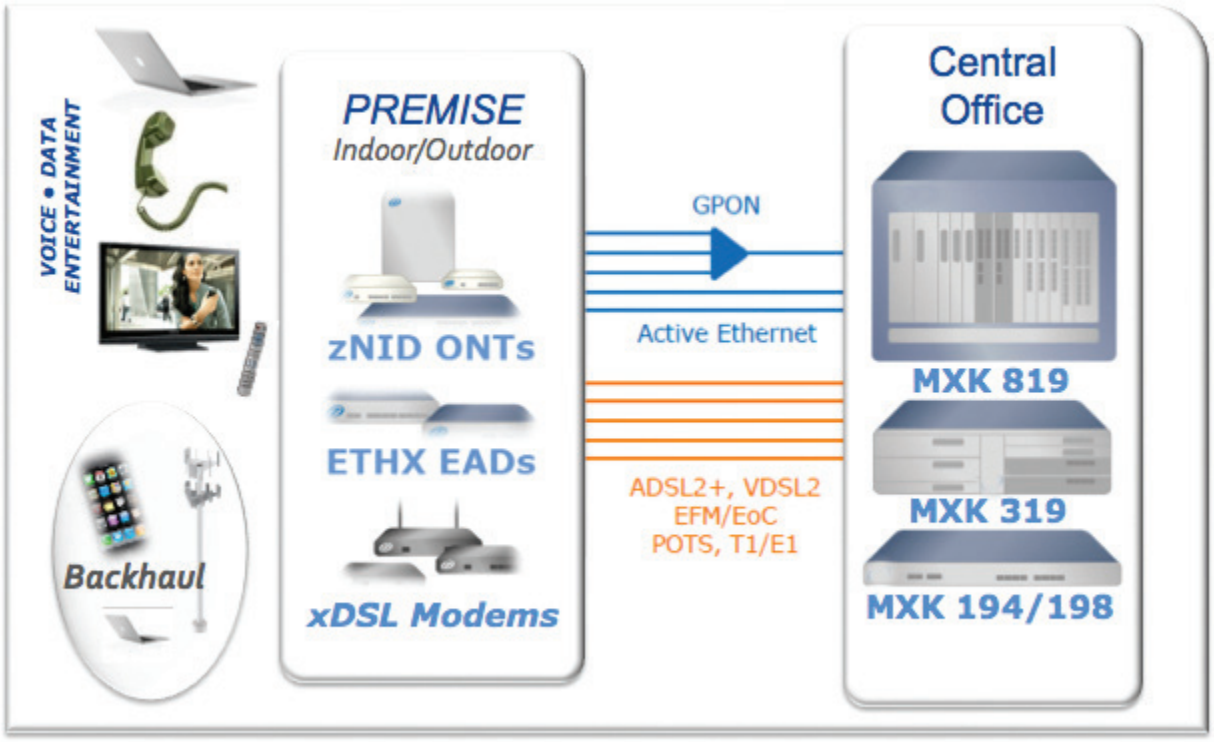
As service providers have moved rather rapidly from copper to fiber in their networks, Passive Optical Network (PON) has become a widely deployed technology utilizing point-to-multipoint fiber architecture. In a typical PON network, OLTs are deployed at the Central Office (CO) site and ONTs are deployed closer to the subscribers. Gigabit PON (GPON), based on ITU-T G.984 standards has become the leading and defacto PON standard providing 2.5 Gbps downstream and 1.25 Gbps upstream bandwidth capability on each deployed fiber. GPON also provides the ability to split the fiber connectivity up to 128x, with 32x and 64x being the norm. The ability to split fiber enables service providers to reach multiple homes and businesses thereby making the service more cost effective and customized for the subscriber needs.

Active Ethernet, another broadband access technology that competes with PON, is also supported on the same OLT by DasanZhone. Active Ethernet, introduced in 2004 as part of the IEEE 802.3ah standard, utilizes point-to-point fiber architecture and active components to provide a full symmetrical 100 Mbps or 1 Gbps connectivity per subscriber.

MXK OLT

DasanZhone's MXK is a fully redundant, carrier-grade All IP platform and the industry's 1st terabit access concentrator. As an OLT, the MXK offers a wide range of options for FTTx solutions. It supports Active Ethernet and GPON line cards, and interoperates with indoor and outdoor ONTs. Supporting Active Ethernet and GPON on the same chassis allows service providers to configure their networks with maximum flexibility and efficiency, using a combination of GPON splitters and dedicated fiber connections.

DasanZhone's MXK features industry-leading density, scalability and switching capacity. The MXK provides non-blocking capacity of up to 3,600 100 Mbps GPON subscribers or 360 1G Active Ethernet subscribers.



Optical Network Terminal (ONT)

To achieve optimum cost efficiency and to maximize service differentiation, service providers building FTTx networks demand ONTs well tuned to their specific requirements. In response to the broad scope of these requirements, DasanZhone has leveraged deep experience in managing the complexity of multi-service access to build the industry's most comprehensive portfolio of FTTx ONTs, for both Active Ethernet and GPON standards.

These models include a variety of configurations for residential, business, MDU, and cellular backhaul applications. Every model in the portfolio is tightly integrated into the DasanZhone Management System, supported by new features such as auto-provisioning and any service-any port configuration that substantially reduce the costs of FTTx network deployment and maintenance.

GPON Indoor

Designed for use within the premise, DasanZhone's indoor GPON ONT family has many options for deployment of FTTx services. Models range from a single Ethernet port to a model with 24 voice ports and 24 Ethernet ports allowing the service provider to choose the right model for the job. The indoor GPON portfolio also includes models with T1/E1 interface for transport over a packet network.

Model	WAN	POTS	T1 / E1	FE	GE	GE-PoE	RF VIDEO	WiFi	USB	IN-WALL
2301	GPON				1					
2402A	GPON				2					
2403A	GPON				2		YES			
2424A	GPON	2			4					
2425A	GPON	2			4		YES			
2426A	GPON	2			4			YES	YES	
2427A	GPON	2			4		YES	YES	YES	
2608T	GPON					8				
2624A	GPON	2			4					
2624P	GPON	2				4				
2628A	GPON	2			8					
2628P	GPON	2			4	4				
2628T	GPON	2				8				
2644A	GPON	4			4					
2644P	GPON	4				4				
2648A	GPON	4			8					
2648P	GPON	4			4	4				
2648T	GPON	4				8				
2804P	GPON					4				YES
5114	GPON	2	4		4					
5120	GPON	2	8		4					
8424	GPON			24						
8524	GPON	24		24						

Model	WAN	POTS	FE	GE	GE-PoE	WiFi	USB	IN-WALL
2204	GE		3	1			YES	
2244	GE	4	3	1			YES	
2284	GE	8	3	1			YES	
2402A	GE			2				
2424A	GE,FE,CU	2		4				
2426A	GE,FE,CU	2		4		YES	YES	
2608T	GE				8			
2624A	GE	2		4				
2624P	GE	2			4			
2628A	GE	2		8				
2628P	GE	2		4	4			
2628T	GE	2			8			
2644A	GE	4		4				
2644P	GE	4			4			
2648A	GE	4		8				
2648P	GE	4		4	4			
2648T	GE	4			8			
2804P	GE				4			YES

Active Ethernet Indoor

DasanZhone's indoor Active Ethernet ONT portfolio is designed for the high bandwidth services being deployed to homes and businesses today. With wire-speed routing, a web UI for local management, and support for DasanZhone's CPE Management system, the DasanZhone Active Ethernet solution paired with the MXK OLT is an efficient way to extend bandwidth intensive services to the network edge.

GPON Outdoor

Based on a wire-speed router architecture, DasanZhone's outdoor GPON ONTs deliver best-in-class data throughput regardless of packet size to support the most demanding FTTx applications. Designed for outdoor deployments, all new models provide dual 1 Gigabit Ethernet LAN ports, two or four voice ports with support for SIP, SIP-PLAR and MGCP Voice over IP protocols. This gives service providers an elegant migration path from legacy to softswitch architectures without replacing ONTs. GPON models are available with and without support for downstream RF Video or RFoG.

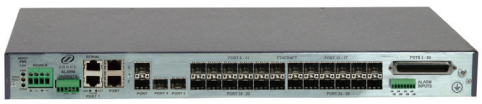
Model	WAN	POTS	GE	RF Video	HCNA-C/P	MoCA	T1/E1	USB
4221	GPON	2	2	YES				YES
4222A	GPON	2	2					YES
4222H	GPON	2	2		C			YES
4223	GPON	2	2	YES	C			YES
4224	GPON	2	2		C,P			YES
4224A	GPON	2	4					YES
4224H	GPON	2	4		C			YES
4226	GPON	2	6					YES
4240	GPON	4	2					YES
4241	GPON	4	2	YES				YES
4242	GPON	4	2		C			YES
4243	GPON	4	2	YES	C			YES
4244	GPON	4	2		C,P			YES
9108	GPON	8	9					YES
9208	GPON	8	9			8		YES
9308	GPON	8	9	YES		8		YES
9440	GPON		5				4	YES
9444	GPON	4	5				4	YES
9480	GPON		9				8	YES
9488	GPON	8	9				8	YES

Active Ethernet Outdoor

Based on a wire-speed router architecture, DasanZhone's outdoor Active Ethernet ONTs deliver best-in-class data throughput regardless of packet size to support the most demanding FTTx applications. All new models provide dual 1Gigabit Ethernet LAN ports, two or four voice ports with support for SIP, SIP-PLAR and MGCP Voice over IP protocols. This gives service providers an elegant migration path from legacy to softswitch architectures without replacing ONTs. Active Ethernet models provide an SFP uplink that supports a wide variety of Active GigE transceivers for even greater deployment flexibility.

Model	WAN	POTS	GE	HCNA-C/P	MoCA	T1/E1	USB
4222A	GE	2	2				YES
4222H	GE	2	2	C			YES
4224	GE	2	2	C,P			YES
4224A	GE	2	4				YES
4224H	GE	2	4	C			YES
4226	GE	2	6				YES
4240	GE	4	2				YES
4242	GE	4	2	C			YES
4244	GE	4	2	C,P			YES
9108	GE	8	9				YES
9208	GE	8	9		8		YES
9440	GE		5			4	YES
9444	GE	4	5			4	YES
9480	GE		9			8	YES
9488	GE	8	9			8	YES

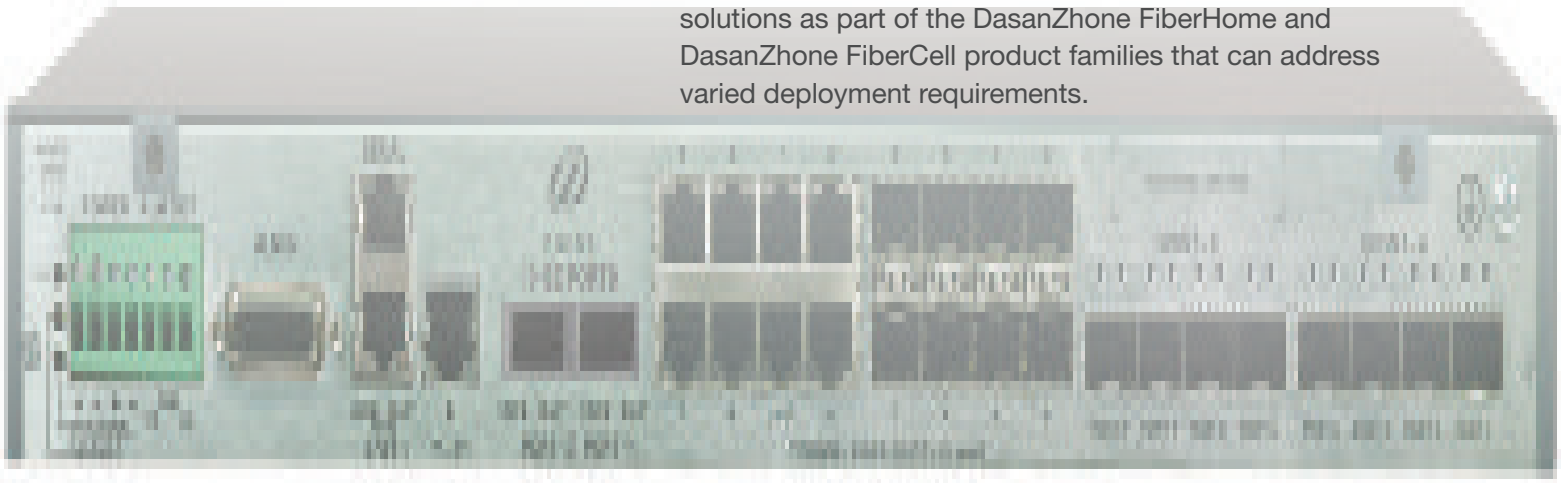
1U SLMS Portfolio



DasanZhone's 1U SLMS portfolio (XP, MX and MXP) is designed as a small form-factor, high-performance access platform, providing uncompromised performance for every access subscriber. The 1U SLMS portfolio is based on native packet processing/switching architecture with non-blocking switching capacity. The portfolio supports Integrated Web Interface for quick device turn-up including advanced configuration & management.

As the needs for bandwidth are growing exponentially in every part of the world, service providers are trying to extend reach and extend to the remote parts of their coverage areas with high speed broadband offerings. The compact and hardened 1U form factor allows cabinet deployment in proximity to subscribers for optimal rate/reach. Service providers are increasingly provisioning high-speed broadband services using ADSL2+, POTS, SHDSL EFM, VDSL2, Active Ethernet, Gigabit Ethernet or GPON technologies, or some combination of all of the above.

To cater to the needs of the service providers and help increase their revenue and customer base in a highly cost-effective manner, DasanZhone has introduced a portfolio of 1U form factor IP-DSLAM, MSAN, OLT and ONU solutions as part of the DasanZhone FiberHome and DasanZhone FiberCell product families that can address varied deployment requirements.



	MX-150	MXP-150	XP-170	MX-160	MX-160-LT-8P	MX-160V-48P	MX-260	MXP-160	MXP-260
CTTP	X	X	X	X	X	X	X	X	X
SHDSL EFM			24-PORT						
ADSL2+	48-PORT	48-PORT		24-PORT (Fallback)	8-PORT (Fallback)	48-PORT (Fallback)	24-PORT (Fallback)	24-PORT (Fallback)	24-PORT (Fallback)
VDSL2				24-PORT (30a)	8-PORT (30a)	48-PORT (17a vectoring)	24-PORT (30a)	24-PORT (30a)	24-PORT (30a)
POTS	48-PORT (Splitters)	48-PORT (VoIP)		24-PORT (Splitters)			24-PORT (Splitters)	24-PORT (VoIP)	24-PORT (VoIP)
FE/GE UPLINK PORTS	2x FE/GE SFP 2X FE/GE RJ45	2x FE/GE SFP 2X FE/GE RJ45	2x FE/GE SFP 2X FE/GE RJ45	4x FE/GE SFP 2X FE/GE RJ45	1xFE/GE SFP 1x FE/GE RJ45	2xFE/GE SFP 2x FE/GE RJ45	3x FE/GE SFP 2X FE/GE RJ45	4x FE/GE SFP 2X FE/GE RJ45	3x FE/GE SFP 2X FE/GE RJ45
GPON UPLINK PORTS							1xGPON SC/APC		1xGPON SC/APC

	MX-180	MX-180-GE	MX-180GE-RJ45	MX-280	MXP-180	MXP-280	MXP-180-TP-RJ45	MXP-280-TP-RJ45
CTTP	X		X	X	X	X	X	X
ETTP	X	X	X	X	X	X	X	X
FTTP	X	X	X	X	X	X	X	X
POTS					24-PORT (VoIP)	24-PORT (VoIP)	24-PORT (VoIP)	24-PORT (VoIP)
ACTIVE ETHERNET	24-PORT FE SFP			24-PORT FE SFP	24-PORT FE SFP or RJ45	24-PORT FE SFP or RJ45	24-PORT FE RJ45	24-PORT FE RJ45
GIGABIT ETHERNET PORTS		24 ports GE SFP or 24 ports GE RJ45	24 ports GE SFP or 24 ports GE RJ45					
FE/GE UPLINK PORTS	4x FE/GE SFP 2X FE/GE RJ45	4xFE/GE SFP, 2x 10GE SFP+ slots	4xFE/GE SFP, 2x 10GE SFP+ slots	3x FE/GE SFP 2X FE/GE RJ45	4x FE/GE SFP 2X FE/GE RJ45	3x FE/GE SFP 2X FE/GE RJ45	4x FE/GE SFP 2X FE/GE RJ45	3x FE/GE SFP 2X FE/GE RJ45
GPON UPLINK PORTS				1x GPON SC/APC		1x GPON SC/APC		1x GPON SC/APC

Single Line, Multiple Service (SLMS)

DasanZhone's SLMS access operating system provides intelligent MSAN and FTTx, functionality on the company's products and solutions, offering advanced capabilities, consistent operational interfaces and unmatched performance across a wide range of form factors and service capabilities. By leveraging SLMS throughout their networks, operators secure greater competitive advantage through more rapid deployment of new service differentiation as well as reduced costs of operation, training, sparing and back office management.

As DasanZhone rolls out new solutions and applications within its IP DasanZhone, DasanZhone FiberHome and DasanZhone FiberCell portfolio, the role of SLMS which is deployed in over 750 service providers globally becomes even more important. The MXK, MX, XP and MALC platforms leverage DasanZhone's well-proven SLMS access operating system for sophisticated service intelligence, to guarantee high quality of experience (QoE) for subscribers, along with ease of management to address rising costs of network operation. The MXK delivers these fundamental advances in access networking while meeting the full spectrum of baseline carrier-class requirements for multi-service and FTTx hardware and software.

Association for Passive Optical LAN

Proud to be a Founding Member

Joint Interoperability Test Certification

DOD Approved Technology

IMACS Integrated Access

The IMACS – an integrated access solution, with over 50 optional service application modules, 4 flexible and scalable chassis options - provides an almost limitless combination of services, applications and network interfaces to provide highly robust set of voice and data access services and applications on one manageable integrated platform.

IMACS 200

The IMACS 200 addresses the need for reliable communications while providing 2U compact size, low cost, and a high level of voice and data integration. This makes it an ideal choice for providing a variety of services to small end points and remote locations in any modern telecommunications network. Optimized for the unique needs of electric utilities, the IMACS 200 system supports a wide range of specialty traffic, including teleprotection (EIA-232 and IEEE C37.94 optical interface to protection relays), SCADA, surveillance video, substation automation and alarms, radio, Ethernet and telephony. In power substations, one of the biggest issues an access system must deal with is EMI from all the high voltage power equipment that is co-located. The IMACS-200 Optical WAN (OWAN) eliminates this problem by transporting the WAN facilities over DS1/E1 equivalent optical fibers. The OWAN can work up to 20 kilometers over a single mode, 1320nm, bi-directional optical port with SC connectors.

IMACS 600, 800, 900

With over 100,000 systems deployed globally, the IMACs, with its advanced patented modular architecture, helps deploy and provision voice and data services in a quick and cost effective manner. Applications including POTS (FXS, FXO, E&M), voice compression (ADPCM), VPN access, Internet access, integrated routing capabilities, voice over Frame Relay, Digital Data Networks (DDN), analog private lines are all enabled via the IMACs. IMACS provides an integrated digital cross-connect to consolidate multiple voice, data, T1/E1 and OC-3 WAN services. It also offers a powerful array of integrated network diagnostic and fault isolation capabilities. These include Bit Error Rate Testers, test tone and signaling state generation, digital and analog loopback support, and remote configuration and control.

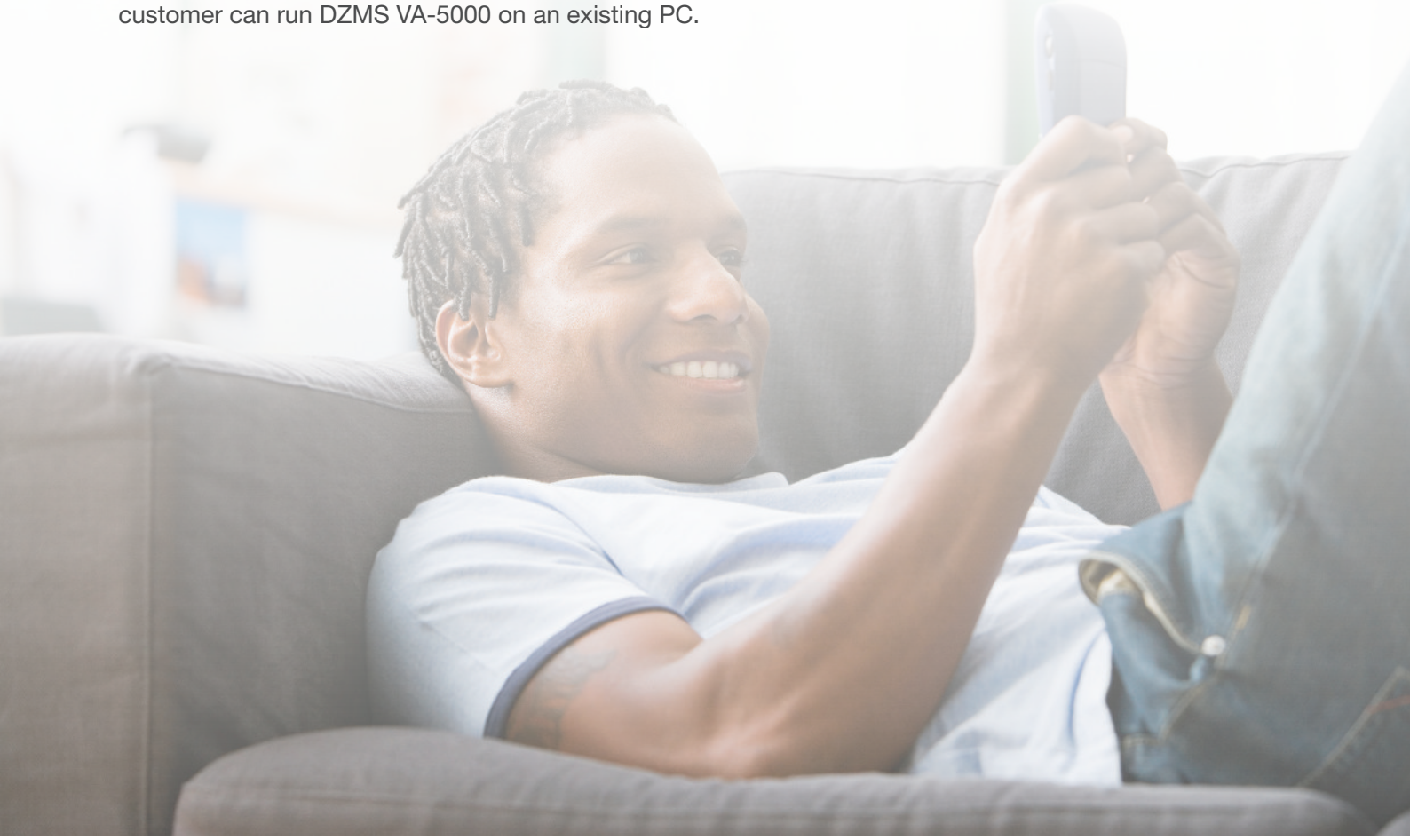
DasanZhone Management System (DZMS)

DasanZhone's DZMS is a highly scalable platform that offers full configuration and management capabilities with an open northbound interface for automated service provisioning from the customer's OSS/BSS system. The platform can be configured for high availability with an additional remote server for disaster recovery. The DZMS application utilizes Oracle's WebLogic and Oracle database to provide state-of-the-art software infrastructure for advanced management capabilities.

DasanZhone's DZMS supports full Fault, Configuration, Accounting, Performance and Security (FCAPS) management. DZMS's FCAPS functionality enables quick turn-up of devices, advanced tools for increased productivity, real-time traffic and service monitoring and historical data collection for trending and analysis.

DZMS OSS Gateway provides an open standards-based Corba or XML interface for seamless integration into existing and new service provider Operations Support Systems (OSS). The interface provides for bi-directional transfer of management information for tasks such as automated flow through provisioning, inventory management, device configuration, capacity and status of various network entities.

We currently offer a new low-cost version of DZMS for small deployments. The new version DZMS VA-5000 is a virtual appliance that will run on x86 platforms with a Windows or Linux operating system. It will have full DZMS functionality but does not currently support OSS integration for automated service provisioning. DZMS VA-5000 is not only a good solution for small customers, moreover a great solution for larger customer that want to delay the purchase of a DZMS server until their networks expand. The customer can run DZMS VA-5000 on an existing PC.



Unified Provisioning

Unified Provisioning is DasanZhone's end-to-end provisioning and management solution for subscriber services. It offers automatic discovery, software upgrade, and service provisioning when the customer premise equipment (CPE) is initially connected to the network. As Unified Provisioning evolves it will continue to provide more streamlined operations to help lower the service provider's costs associated with activating and managing subscriber services.

Unified Provisioning is an end-to-end solution with software components residing in the OA&M infrastructure of the DasanZhone devices, as well as on the DZMS platform. This architecture provides a highly scalable and extensible model for provisioning and managing subscriber services. This effectively enables service providers to remotely configure, provision and manage either a single device or multiple devices concurrently in a manual or automated fashion. Service providers benefit tremendously from a reduced Total Cost of Ownership (TCO) owing primarily to the recurring OPEX savings derived from auto-provisioning, remote configuration and a host of other features enabled by Unified Provisioning

Features like automatic control of software version on all deployed CPEs and ONTs, automatic configuration updates, elimination of the need to manage and provision CPEs and ONTs individually via WebUI or Telnet, extended visibility from DZMS to provision specific configuration parameters of the ONTs, elimination of truck rolls for troubleshooting, etc. are significant features that reduce recurring OPEX for the service provider.

Customer Premise Equipment (CPE)

DasanZhone's endpoint solutions include a full range of residential and business class CPEs supporting Wi-Fi, VoIP and video, as well as a full range of QOS capabilities to allow service providers the ability to easily serve multiple subscriber types with multiple service options. DasanZhone's CPE portfolio includes ADSL2+ modems, VDSL2 modems and SHDSL modems designed for today's advanced copper connectivity with optional WiFi capability.

ADSL2+ SERIES

DasanZhone's 15xx series are FCC/UL/CE/ RoHS compliant, Broadcom-based ADSL2+ CPEs and gateways supporting 1 or 4 Ethernet 10/100 BaseT ports, IGMP support for video deployments with additional WiFi capability in the 1518-A1 and B1 models.

DasanZhone's 6381-A5 model is TI-based ReachDSL/ADSL2+ CPE and Gateway. The 6381-A5 model auto-detects ReachDSL and ADSL2+ technologies and provides other standard features like Bridging, Routing, Firewall and QoS.

DasanZhone's ADSL2+ 65xx series product family provides Broadcom-based ADSL2+ CPE and Gateway with built-in phone filter capabilities, support of Annex L and Annex M, bridging, routing, firewall, QoS, port mapping, and other advanced features with additional WiFi capability in the 6518-A1 and 6519-A1 models.

VDSL2 SERIES

DasanZhone's 6718-A1 is a Broadcom-based high-end triple-play-ready residential gateway with advanced router and bridge functions that supports multiple WAN interfaces with support of VDSL2, ADSL2+ and a Gigabit Ethernet WAN link. 6718 -A1 is equipped with 4 10/100 LAN ports and provide WiFi capability via support for 802.11 b/g/n.

ADSL2 +SERIES

Model	WAN	Annex	10/100 Eth	WiFi (Power)	USB	Phone Filter	TR-69	Dying Gasp
1512-B1	ADSL2+	B,L,M	4	N/A	N/A	NO	YES	YES
6381-A5	Reach DSL/ADSL2+	A, Reach DSL	1	N/A	USB Client	YES	YES	YES
6511-A1	ADSL2+	A,L,M	1	N/A	N/A	YES	YES	YES
6512-A1	ADSL2+	A,L,M	4	N/A	1 USB Host	YES	YES	YES
6518-A1	ADSL2+	A,L,M	4	802.11 b/g/n (1x1) Normal	1 USB Host	YES	YES	YES
6519-A2	ADSL2+	A,L,M	4	802.11 b/g/n (2x2 5dB) 200mw	1 USB Host	YES	YES	YES

VDSL2 SERIES

Model	WAN	Profile	10/100 Eth	WiFi (Power)	USB	TR-69	Dying Gasp	SIP FXS	G.INP	G. Vector Support
6718-A1	VDSL2 / ADSL2+ Gigabit Ethernet	8,12,17	4	802.11 b/g/n (2x2) Normal	1 x Host 2.0	YES	YES	N/A	YES	YES
6712-W1	VDSL2 / ADSL2+ Gigabit Ethernet	8,12,17	4	N/A	2 x Host 2.0	YES	YES	N/A	YES	YES
6718-W1	VDSL2 / ADSL2+ Gigabit Ethernet	8,12,17	4	802.11 b/g/n (2x2) Normal	2 x Host 2.0	YES	YES	N/A	YES	YES
6728-W1	Bonded VDSL2 / ADSL2+ Gigabit Ethernet	Single 8,12,17,30 Bonded 8,12,17,30	4	802.11 b/g/n (2x2) Normal	2 x Host 2.0	YES	YES	N/A	YES	YES
6732-W1	VDSL2 / ADSL2+ Gigabit Ethernet	8,12,17,30	4	N/A	2	YES	YES	N/A	YES	YES
6738-W1	VDSL2 / ADSL2+ Gigabit Ethernet	8,12,17,30	4	802.11 b/g/n (2x2) Normal	2	YES	YES	N/A	YES	YES
6742-W1	VDSL2 / ADSL2+ Gigabit Ethernet	8,12,17	4	N/A	2	YES	YES	2	YES	YES
6748-W1	VDSL2 / ADSL2+ Gigabit Ethernet	8,12,17	4	Normal	2	YES	YES	2	YES	YES
6729-W1	Bonded VDSL2 / ADSL2+ Gigabit Ethernet	Single 8, 12, 17, 30 Bonded 8, 12, 17	4	400mw 802.11 b/g/n (2x2)	2	YES	YES	N/A	YES	YES
6759-W1	Bonded VDSL2 / ADSL2+ Gigabit Ethernet	Single 8, 12, 17, 30 Bonded 8, 12, 17	4	400mw 802.11 b/g/n (2x2)	2	YES	YES	N/A	YES	YES

SHDSL SERIES

DasanZhone's SHDSL CPE are ideal for business applications with support for symmetric bandwidth and the ability to bond multiple copper loops for high speed connectivity. Providing the bandwidth needed to deliver business-class services, the G.SHDSL CPEs are full-featured routers offering a cost effective solution for symmetric data rate applications.

DasanZhone's EFM SHDSL CPEs offer the high bandwidth symmetrical Ethernet services that are demanded by businesses and enterprises. EtherXtend access devices can be used back-to-back for single-line deployments, in multi-point applications where one EtherXtend acts as a mini aggregation point, or as powerful CPE for use with either DasanZhone's MALC or MXK.

DasanZhone's EFM SHDSL w/PWE3 CPEs offer the ultimate flexibility in Ethernet access with the addition of PseudoWire Edge to Edge Emulation (PWE3) capability. Using PWE3 and optional T1/E1 or V.35 interfaces, EtherXtend is able to carry legacy circuit traffic across the Ethernet infrastructure. Now TDM connectivity, PBX interconnection, and other legacy applications are supported directly over Ethernet. Voice, video and data -- over IP or TDM -- all using a single Ethernet Access platform are enabled.

	3400 Series	3200 Series	3100 Series	3000 Series	2100 Series	TNE	SNE	ENE
WAN Interface	SHDSL.bis 11.4 Mbps	SHDSL.bis 11.4 Mbps	SHDSL.bis 11.4 Mbps	SHDSL.bis 11.4 Mbps	SHDSL.bis 5.7 Mbps	T1 1.544 Mbps	SHDSL 2.3 Mbps	E1 2.048 Mbps
WAN Ports	4 or 8	1, 2, or 4	4	1, 2 or 4	1 or 2	1, 2, 4 or 8	1, 2 or 4	1, 2, 4 or 8
Bandwidth (at max ports)	Up to 91.2 Mbps	Up to 45.6 Mbps	Up to 45.6 Mbps	Up to 45.6 Mbps	Up to 11.4 Mbps	Up to12 Mbps	Up to 9.2 Mbps	Up to16 Mbps
T1 / E1	2		2	2				
Loop Bonding	802.3ah EFM N2N	802.3ah EFM	802.3ah EFM	802.3ah EFM	N2N	N2N	N2N	N2N
LAN Interfaces 10/100 Base-T	4	4	4	4	1 or 2	1 (1/2 port) 4 (4/8 port)	1	1 (1/2 port) 4 (4/8 port)
Management	CLI, Web, SNMP	CLI, Web, SNMP	CLI, Web, SNMP	CLI, Web, SNMP	CLI, Web, SNMP	CLI, Web, SNMP (4/8 port)	Unmanaged	CLI, Web, SNMP (4/8 port)
QoS	802.1p	802.1p	802.1p	802.1p	802.1p	802.1p		802.1p
Layer 2 Layer 3	Bridging Routing	Bridging Routing	Bridging Routing	Bridging Routing	Bridging L3 aware	Bridging L3 aware	Bridging	Bridging L3 aware
Voice Ports		4 or 8						

Cabinets

Complementing DasanZhone's highly scaleable and full-featured access portfolio is one of the largest portfolios of outside plant cabinets from an access vendor. DasanZhone's OPX line of cabinets supports densities from 24 ports to 1800 ports all pre-configured and tested at DasanZhone facilities and ready to be installed on the concrete slab, pole or wall upon arrival at the service provider's location.

Large Cabinet Portfolio – OPX 4300 44UX/88UX Series

The OPX4300 44UX/88UX Outside Plant Exchange Cabinet Family was specifically designed to provide outdoor housing solutions for DasanZhone MSANs.This family of cabinets features Enhanced Cooling Systemwith superior heat dissipation that can accommodate higher line density and traffic rate applications as well as significantly improving batterylife. Utilizing heavy-duty aluminum construction, the cabinets provide corrosion, weather, fire, and vandal resistant protection and are designed to meet Telcordia GR-487 Issue 2 requirements.

The OPX4300 44UX/88UX family can accommodate from 200 lines up to 2000 lines, depending on the type of fiber or copper access equipment selected and installed. The OPX4300 44UX/88UX can be mounted on an existing host pad as an adjunct installation, utilizing an overhang plate. The Enhanced Cooling System enables a reduced cost-per-line solution and the capability for higher traffic rates and denser electronic equipment by greatly reducing battery temperatures without the use of air conditioners.

Small Cabinet Portfolio – OPX 4300 4U, 6U and 9U

DasanZhone's OPX4300 4U/6U/9U Outside Plant Exchange is a unique and cost-effective cabinet family that enables service to all subscribers by bringing the access closer to the end point. The OPX4300 provides up to 400 ports of copper and fiber ports. The OPX4300 cabinets can be mounted on a wall, or a pole next to existing cabinets. Service provider utilizes a single product whether deploying from the central office, existing remote cabinets, or extremely remote locations, making the operational and management of the network that much easier.

The OPX4300 cabinet allows for multiple powering options including DC Power (48 VDC), AC Power (90 / 240 VAC) and Line Power (1340 / 190 VDC), to allow for easy installation in all locations. The powering options along with the multiple fiber and copper access options ensure the availability of triple play services to any customer.

OPX - OSP 1U

DasanZhone's OPX-OSP 1U provides up to 48 ports of DSL and POTS. The OPX-OSP1U can be mounted on a wall, or a pole next to existing cabinets. Each OPX-OSP 1U cabinet is shipped pre-wired with 50-pair protection panels and can be used with DasanZhone's 1U DSLAM and MSAP products. This lets the service provider utilize a single product whether deploying from the central office, existing remote cabinets, or extremely remote locations, making the operational and management of the network that much easier.

Global Service and Support

DasanZhone's Global Services and Support (GSS) team has the highest level of technical and customer service expertise for delivering "Service Excellence", and offers a full suite of Professional Services and Support Programs for assisting in the network deployment.

Professional Services

The DasanZhone GSS team has the technical expertise and flexibility to customize each service offering to meet the needs of our customer. DasanZhone offers a full suite of Professional EF&I services and includes:

- Network Engineering
- Installation and Cut-over services
- Onsite technical support (Per incident or Resident engineer)
- Project Management
- Network Audits and Upgrade

Technical Assistance Center (TAC) and Field Service

DasanZhone's GSS TAC is committed to "Customer Satisfaction" and a leader in providing "Service Excellence" for optical access. The team consists of a highly trained and experienced technical staff distributed in six support centers around the world. Support centers are located in North America (Oakland, CA; Largo, FL; Alpharetta, GA), CALA, MEA, and Europe. GSS centers of "Service Excellence" provide 7x 24 support and normal operating hours are from 8 A.M to 4 P.M local regional time. WEB access is available 24 hours a day and registered customers may open and track trouble reports via their online accounts.

Warranty and Support

Customer Care programs provide a range of value added services to complement and maximize your investment. Extended service packages are available and may be selected and customizedto fit your particular support model. Warranty and Support packages include, but are not limited to the following:

- Extended HW/SW warranty
- Advanced HW Replacement
- Access to new software releases and fixes
- Guaranteed Response Times

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Miami • Milan • Moscow • Oakland • San Juan, PR • São Paulo • Singapore • Stockholm
Tampa • Toronto

DZS

DASAN Zhone Solutions