ZYXEL

IES6100/6000/5112/5106 Series

Zyxel Chassis MSAN

Benefits

Future-proof architecture

The Zyxel Chassis MSAN, IES6100/6000/5112/5106 Series, is equipped with non-blocking Gigabit backplane, failover-enabled Management Switch Cards (MSC), dual input power modules and various high-port density multi-purpose line cards. With comprehensive IP-centric firmware features, the Zyxel Chassis MSAN is a high-capacity system that facilitates telcos/ ISPs to deliver high-quality residential or business user services experience at competitive CAPEX/OPEX as well as satisfying its current and future infrastructural requirements of reliability, flexibility and scalability.

Easy & reused logistics

The Zyxel Chassis MSAN has various chassis with different height and slot quantity. All management card share the same attributes of their predecessors and are IPv6 hardware ready. The variety of line cards is including 72-port ADSL2+ line card that provides subscribers with asymmetric transmission bandwidth up to 25 Mbps/2.4 Mbps; 48-port SHDSL line cards with symmetric transmission bandwidth of 5.69 Mbps per port; 24-port and 48-port VDSL2 line cards that offer up profile 30a (100/100 Mbps) high-speed connectivity per port over copper wires; 20-port fiber-based Gigabit Ethernet line card that supports 100/1000 Mbps transmission speed per port. The new 48-port ADSL2+/VoIP combo card with built-in ETSI/ ANSI POT splitter can be managed by the new MSC1024GC Management Switch Signaling Card. MSC1024GC and MSC1224GC are able to support IP aggregation for all the combo cards in the same chassis.

- Multi-service interfaces including ADSL2/2+, SHDSL, VDSL2, VoIP (SIP & H.248), fiber-based GE
- 10G Ethernet uplinks to provide non-blocking network interfaces
- Comprehensive QoS to Enhance Triple Play users' experience
- Field proven IGMP v1, v2, v3 snooping and proxy for IPTV deployment
- Flexible ACL, VLAN-aware DHCP and Anti-IP/MAC address spoofing to prevent malicious attack
- DHCP option 82 and PPPoE IA features support versatile IP address assignment

Advanced Triple Play and mass deployment functionality

The Zyxel Chassis MSAN inherits all the Layer 2 and Layer 3 QoS, security and multicast functionalities, while the following new features are added to satisfy the requirements for massive field deployments: (1) IP bridge functionality that alleviates the Layer 2 access network deployment restrictions resulted from MAC address table limitation and security attack issues; (2) ARP Proxy which minimizes the ARP broadcast requests to all subscribers; (3) TACACS+ mechanism to support remote authentication with TACACS+ servers; (4) VLAN-aware DHCP snooping which adds VLAN information into DHCP snooping tables; (5) DHCP option 82 sub-option 2 for providing remote client ID information to DHCP servers for flexible IP address assignment.

Environment-friendly two-way airflow for cold-hot aisle telecommunication rooms

The IES6100M fan module supports two-way — back-to-front and front-to-back — airflow, so users can switch the direction according to different telecommunication room layouts. As cold-hot aisle telecommunication rooms enjoy better air cycle and cooling efficiency, they save electric bills by better utilization of the air-conditioning systems.

Robust physical safety design

The IES6100M and IES-6000M/5112M support 1+1 MSC redundancy with a failover switching time less than 1 second. In addition, voltage, temperature and fan speed sensors are fitted into the system. When an abnormal condition is detected, the LED displays and/or the corresponding alarms will alert administrators of the situation. In case the system temperature rises over the preset threshold, thermal cutoff protection will kick in to shut down the system automatically.

Sophisticated OAM&P features

The Zyxel Chassis MSAN provides various management methods: local console port, Web-based configuration, Telnet and SNMP v1/v2c/v3-based EMS (NetAtlas EMS). The management functions include Alarm and Status Surveillance, Configuration Management, Performance Management and Fault Management. The Zyxel Chassis MSAN allows multiple administrative accounts with access privileges. NetAtlas EMS also provides view-based MIB management that partial MIB objects can be defined and accessed for customization and security reasons. In addition, XML-based northbound interface is equipped to interoperate with external OSS systems.

System Architecture

IES6100M

IES-6000M

IES-5112M

IES-5106M

Management Switch Cards

MSC1224GB

MSC1024GB

Management Switch Signaling Cards with VoIP support

MSC1224GC

MSC1024GC

Gigabit Ethernet Line Card

GLC1320G-55

VDSL Line Cards

VLC1348G-51

VLC1348G-53

VLC1424G-56

ADSL Line Card

ALC1372G-51

ADSL Combo Line Card

ALC1348G-51C

SHDSL Line Card

SLC1348G-22

VoIP Line Card

VOP1372G-61

Specifications

System Specifications

DSL Compliant

- ADSL:
  - G.992.1 Annex A, G.992.3 Annex A, G.992.5 Annex A
  - G.992.1 Annex B, G.992.3 Annex B, G.992.5 Annex B
    - Support G.992.3 and G.992.5 spectral mask
    - Support Annex M and Annex L in G.992.3 and G.992.5
    - Support EOC and overhead channel access
    - Support the latency path function
    - Support loop diagnostic function specified
    - Support the power management capability
    - Support the capability of the Seamless Rate Adaptation (SRA) on-line configuration
    - Single and dual end loop test
    - G.998.1 port bonding
- SHDSL: G.991.2, G.991.2.bis, G.998.1
- VDSL2: G.993.2, G.994.1, G.997.1

ATM Traffic Management

- Support 8 PVC per DSL port
- Support UBR, CBR, rt-VBR, nrt-VBR, QoS mechanisms
- Support ATM Forum TM 4.0 peak cell rate traffic parameter
- Support downstream traffic shaping function per ATM PVC
- Support ATM F5 OAM cells for end-to-end loop back test (ITU-T Rec. I.610)

Performance

- Eight queues with packet priority scheduling (SPQ, WRR)
- Support 1024 IGMP multicast groups
- The maximum channel zapping processing time is 250 ms
- DSCP to 802.1p mapping

Security

- Per port and per VLAN isolation
- IEEE 802.1X (authentication)
- Rule-based packet filtering (L2 - L4 ACL)
- MAC count limiting
- ARP broadcast filtering
- DHCP broadcast filtering
- VLAN aware DHCP snooping
- NetBiOS filtering
- IGMP filtering
- Anti IP/MAC address spoofing
- Support TACACS+ remote authentication
- PPTP, LT2P, IP SEC and GRE pass through

- IPoE and PPPoE per VC session

VLAN

- 4094 IEEE 802.1Q compliant VLAN tagging
- VLAN stacking (Q-in-Q)
- VLAN bridge function (multiple PVCs to one VLAN)(N:1)
- PVC and VLAN one to one mapping (1:1)
- VLAN trunking (single PVC join multiple VLAN)(1:N)
- Support GVRP function

Traffic Management

- Bandwidth control and broadcast/multicast/unknown unicast control on Gigabit Ethernet ports
- STP: IEEE 802.1d, IEEE 802.1w, IEEE 802.1s
- IP bridge
- IEEE 802.3ad (Link aggregation control protocol)
- IP multicast forwarding
- IGMP v1, v2, v3 snooping/proxy
- IGMP multicasting channel limiting
- VLAN aware DHCP snooping
- DHCP relay option 82 with sub-option 1 & 2
- TR-101 compliant PPPoE intermediate agent
- Multicast bandwidth control
- L2 - L4 ACL per VLAN
- IGMP group count/filtering profile

VoIP Features

- Codes: G.711, G.726, G.729a/b, G.723.1
- Network signaling protocols: ITU-T H.248 v2, SIP v2 (RFC3261)
- RTP (RFC 1889)
- RTCP (RFC 1890)
- FAX/Modem pass through (T.38) via RTP
- Tone detection and generation (bi-directional)—RFC2833 RTP Payload for DTMF
- Echo cancellation and auto gain control (G.165, G.168)
- Voice Activity Detection (VAD)
- Comfort Noise Generation (CNG)
- Caller ID generation and detection
- Supplementary services:
  - Local dial available
  - Emergency call local route
  - Do not disturb
  - Selective/anonymous call rejection
  - Call waiting
  - Call transfer (blind and attended transfer)
  - Call return and call back on busy
  - Off hook warning tone

Network Management

- Local management through a craft terminal
- Web-based management interface
- View-based network management
- Support XML-based North Bound Interface (through Zyxel NetAtlas EMS)
- In-band and out-of-band IP interface for management (SSH, SFTP)
- SNMP management (through Zyxel NetAtlas EMS)
- SNMPv1/v2c/v3 agent/traps
- Standard MIBs:
  - RFC 1213 MIB II
  - ADSL line MIB (RFC2662)/extension line MIB (RFC 3440)
  - SHDSL line MIB (RFC 3276)
  - VDSL line MIB (RF3728)
  - Bridge MIB/extension MIB
  - RMON MIB (RFC 1757)
- Vendor specific MIBs, e.g.,
  - Chassis management MIB (fan speed, voltage, temperature)
- Static route for MGMT IP

Hardware Specifications

IES6100M/IES-6000M

- 17-slot rack mountable enclosure, 19" chassis
- Maximum 16 slots for DSL line cards (slot 1 - 7, 8 or 9, 10 - 17)
- 2 slots for management and switch cards (slot 8 & 9)
- 2 DC power input module and filter
- One FAN and dust filter module
- One alarm module
- Support 2-way air flow fan module (IES6100M)

IES-5112M

- 12-slot rack mountable enclosure, 19" chassis
- Maximum 10 slots for line cards (slot 1 - 5 and 8 - 12)
- 2 slots for management and switch cards (slot 6 and 7)
- 2 DC power input module and filter
- One FAN and dust filter module
- One alarm module

IES-5106M

- 6-slot rack mountable enclosure, 19" chassis
- Maximum 5 slots for line cards (slot 1 - 5)
- 1 slots for management and switch cards (slot 6)
- 2 DC power input module and filter
- One FAN and dust filter module
- One alarm module

Management Switch Cards—MSC1224GB/MSC1024GB

- Failover-enabled network termination card
- Embedded 48G, non-blocking full duplex switching fabric
- MSC1224GB supports two 10G (SFP+) and four 1G uplink/subtending interfaces:
  - 2 optical fiber port (SFP+ modules)
  - 4 1000 Mbps interface modules (combo design, SFP and copper)
- MSC1024GB supports four Gigabit Ethernet uplink/subtending interfaces:
  - 4 1000 Mbps interface modules (combo design, SFP and copper)
- One mini-RJ11 console port
- One 10/100M out-of-band Mgmt interface
- 16 Gigabit Ethernet (SerDes) backplane interface
- 16K MAC addresses
- 1024 L2 multicast groups (1K scalability)
- 4K VLANs
- IPv6 capable

Management Switch Signaling Cards—MSC1024GC/MSC1224GC

- VoIP media IP aggregation
- Failover-enabled network termination card
- Embedded 48G, non-blocking full duplex switching fabric
- MSC1224GC supports two 10G (SFP+) and four 1G uplink/subtending interfaces:
  - 2 optical fiber port (SFP+ modules)
  - 4 1000 Mbps interface modules (combo design, SFP and copper)
- MSC1024GC supports four Gigabit Ethernet uplink/subtending interfaces:
  - 4 1000 Mbps interface modules (combo design, SFP and copper)
- One mini-RJ11 console port
- One 10/100M out-of-band Mgmt interface
- 16 Gigabit Ethernet (SerDes) backplane interface
- 16K MAC addresses
- 1024 L2 multicast groups (1K scalability)
- 4K VLANs
- IPv6 capable

Gigabit Ethernet Line Card—GLC1320G-55

- Hot swappable 20-port active Gigabit Ethernet line card
- 20 open slots for Gigabit or Fast Ethernet SFP (1000/100BASE-FX/BX/LX/EX)
- 4 open slots for Gigabit Ethernet C-SFP
- One mini-RJ11 console

VDSL Line Card—VLC1424G-56

- Hot swappable 24-port VDSL2 line card
- Support G.993.2, G.994.1, G.997.1
- Maximum transmission rate up to 100 Mbps/100 Mbps
- One mini-RJ11 console port
- Two gigabit backplane
- Support VDSL2 profiles 8a, 8b, 8c, 8d, 12a, 12b, 17a and 30a
- Support frequency allocation bandplan 998 and 997
- Support customer PSD, RFI notch, single latency in PTM mode and INP
- Support trellis coding
- Support IEEE 802.1ag Connectivity Fault Management (CFM)
- IPv6 capable

VDSL Line Cards—VLC1348G-51/VLC1348G-53

- Hot swappable 48-port VDSL2 line card over POTS and over ISDN
- Support G.993.2, G.994.1, G.997.1
- Maximum transmission rate up to 100 Mbps/50 Mbps
- One mini-RJ11 console port
- Two gigabit backplane
- Support VDSL2 profiles 8a, 8b, 8c, 8d, 12a, 12b and 17a
- Support frequency allocation bandplan 998 and 997
- Support U0 band, customer PSD, RFI notch, single latency in PTM mode and INP
- Support UPBO and DPBO, Reed Solomon and trellis coding
- Support ADSL fall back with ADSL/ADSL2/ADSL2+ CPE in Annex A, J, M, L modes
- Support IEEE 802.1ag Connectivity Fault Management (CFM)

ADSL Line Card—ALC1372G-51

- Hot swappable 72-port ADSL2/ADSL2+ Annex A line card
- Maximum transmission rate up to 25 Mbps/2.4 Mbps for ADSL2+
- One mini-RJ11 console port
- One gigabit backplane
- Support G.992.3 and G.992.5 spectral mask
- Support EOC and overhead channel access defined in G.992.3 and Rec.G.997.1
- Support the latency path function specified in G.992.3 and G.992.5
- Support Annex L and Annex M specified in G.992.3 and G.992.5
- Support loop diagnostic function specified in G.992.3 and G.992.5
- Support the power management capability specified in G.992.3 and G.992.5
- Support the capability of the Seamless Rate Adaptation (SRA) on-line configuration specified in G.992.3 and G.992.5
- Support ADSL2+ 2-port bonding (G.998.1)
- IPv6 capable

ADSL Combo Line Card—ALC1348G-51C*

- Hot swappable 48-port ADSL2+/VoIP Combo Card with built-in ETSI/ANSI POT Splitter
- Maximum transmission rate up to 25 Mbps/2.4 Mbps for ADSL2+
- One mini-RJ11 console port
- One gigabit backplane
- Support G.992.3 and G.992.5 spectral mask
- Support EOC and overhead channel access defined in G.992.3 and Rec.G.997.1
- Support the latency path function specified in G.992.3 and G.992.5
- Support Annex L and Annex M specified in G.992.3 and G.992.5
- Support loop diagnostic function specified in G.992.3 and G.992.5
- Support the power management capability specified in G.992.3 and G.992.5
- Support the capability of the Seamless Rate Adaptation (SRA) on-line configuration specified in G.992.3 and G.992.5
- Support ADSL2+ 2-port bonding (G.998.1)
- Support H.248 version 2 or SIP singling protocol
- Compatible CPE including POTS phone, Fax, analog modem and pay phone
- Support G.711 a/μ, G.726, G.729 a/b G.723.1
- 20K Busy Hour Call Attempts (BHCA)
- Configurable jitter buffer
- Support the generation of dial tone, second dial tone, ringing tone (ring-back tone), busy tone, off-hook warning tone
- Support call waiting, call hold, call transfer, return and call back on busy
- Emergency call local route
- Local dial available
- MLT (Metallic Loop Testing for subscriber lines) and GR-909 loop diagnostic
- Ringer Max output power: 40W
- IPv6 capable

SHDSL Line Card—SLC1348G-22

- Hot swappable 48-port SHDSL line card
- Support ETSI TS 101 524 V 1.2.1, ITU-T G.991.2, ITU-T G.991.2.bis
- ATM-based multi-pair bonding (G.998.1) up to 8 ports
- Symmetric transmission rate of 5.69 Mbps/port
- One mini-RJ11 console port
- One gigabit backplane
- EFM mode compliant to IEEE 802.3, G.998.2
- PPP over Ethernet (RFC2516)
- OAMPDU Loopback Control
- VLAN base QOS (802.1P/Q)
- Support 2-wire/4-wire/6-wire and 8-wire mode SHDSL CPE auto detect in either ATM mode and EFM mode

VoIP Line Card—VOP1372G-61*

- Hot swappable 72-port VoIP line card
- Support H.248 version 2 or SIP singling protocol
- Compatible CPE including POTS phone, Fax, analog modem and pay phone
- Support G.711 a/μ, G.726, G.729 a/b G.723.1
- 20K Busy Hour Call Attempts (BHCA)
- Configurable jitter buffer
- Support the generation of dial tone, second dial tone, ringing tone (ring-back tone), busy tone, off-hook warning tone
- Support call waiting, call hold, call transfer, return and call back on busy
- Emergency call local route
- Local dial available
- MLT (Metallic Loop Testing for subscriber lines) and GR-909 loop diagnostic
- Ringer Max output power: 24 Watt
- IPv6 capable

* Only works with MSC1024GC or MSC1224GC

Chassis and Line Card Sepcificaitons

Chassis	IES6100M	13U 17-slot temperature-harden chassis MSAN with cold-hot aisle supporting
	IES-6000M	12.5U 17-slot temperature-harden chassis MSAN
	IES-5112M	8.5U 12-slot temperature-harden chassis MSAN
	IES-5106M	5U 6-slot temperature-harden chassis MSAN
Management Switch Cards	MSC1024GB	Management and switching card with 4 GbE uplink ports
	MSC1224GB	Management and switching card with two 10G and 4 GbE uplink ports
	MSC1024GC	VoIP signaling process, uplink and management card
	MSC1224GC	VoIP signaling process, uplink and management card with two 10G SFP+ ports
VDSL Line Cards	VLC1348G-51	48-port DMT-based VDSL2 line card (Annex A, 17a profile)
	VLC1348G-53	48-port DMT-based VDSL2 line card (Annex B, 17a profile)
	VLC1424G-56	24-port DMT-based VDSL2 line card (Annex A, 30a profile)
VoIP Line Card	VOP1372G-61	72-port VoIP line card (SIP or H.248)
Gigabit Ethernet Line Card	GLC1320G-55	20-port Gigabit Ethernet line card
ADSL Line Card	ALC1372G-51	72-port Annex A ADSL2/ADSL2+ line card over POTS
ADSL Combo Line Card	ALC1348G-51C	ADSL combo line card with hot swappable 48-port ADSL2+/VoIP combo card with built-in ETSI/ANSI POT splitter

Physical Specifications

IES6100M
- Item dimensions (WxDxH): 440 x 250 x 553 mm (17.32" x 9.84" x 21.77")
- Item weight: 18.1 kg (39.9 lb.)

IES-6000M
- Item dimensions (WxDxH): 440 x 250 x 544 mm (17.32" x 9.84" x 21.41")
- Item weight: 15 kg (33.07 lb.)

IES-5112M
- Item dimensions (WxDxH): 440 x 250 x 363 mm (17.32" x 9.84" x 14.29")
- Item weight: 13.34 kg (29.41 lb.)

IES-5106M
- Item dimensions (WxDxH): 440 x 250 x 215mm (17.32" x 9.84" x 8.46")
- Item weight: 10.2 kg (22.49 lb.)

Management Switch Card—MSC1224GB
- Item dimensions (WxDxH): 390.6 x 259.25 x 24 mm (15.38" x 10.21" x 0.94")
- Item weight: 0.9 kg (1.98 lb.)

Management Switch Card—MSC1024GB
- Item dimensions (WxDxH): 390.6 x 259.25 x 24 mm (15.38" x 10.21" x 0.94")
- Item weight: 0.87 kg (1.92 lb.)

Management Switch Signaling Card—MSC1024GC
- Item dimensions (WxDxH): 390.6 x 259.25 x 24 mm (15.38" x 10.21" x 0.94")
- Item weight: 1.97 kg (4.34 lb.)

Management Switch Signaling Card—MSC1224GC
- Item dimensions (WxDxH): 390.6 x 259.25 x 24 mm (15.38" x 10.21" x 0.94")
- Item weight: 2.0 kg (4.41 lb.)

Gigabit Ethernet Line Card—GLC1320G-55
- Item dimensions (WxDxH): 390.6 x 259.25 x 24 mm (15.38" x 10.21" x 0.94")
- Item weight: 0.5 kg (1.1 lb.)

VDSL Line Card—VLC1424G-56
- Item dimensions (WxDxH): 390.6 x 259.25 x 24 mm (15.38" x 10.21" x 0.94")
- Item weight: 1.1 kg (2.43 lb.)

VDSL Line Cards—VLC1348G-51/VLC1348G-53
- Item dimensions (WxDxH): 390.6 x 259.25 x 24 mm (15.38" x 10.21" x 0.94")
- Item weight: 1.3 kg (2.87 lb.)

ADSL Line Card—ALC1372G-51
- Item dimensions (WxDxH): 390.6 x 259.25 x 24 mm (15.38" x 10.21" x 0.94")
- Item weight: 1.1 kg (2.43 lb.)

ADSL Combo Line Card—ALC1348G-51C
- Item dimensions (WxDxH): 390.6 x 259.25 x 24 mm (15.38" x 10.21" x 0.94")
- Item weight: 1.5 kg (3.51 lb.)

SHDSL Line Card—SLC1348G-22
- Item dimensions (WxDxH): 390.6 x 259.25 x 24 mm (15.38" x 10.21" x 0.94")
- Item weight: 0.5 kg (1.1 lb.)

VoIP Line Card—VOP1372G-61
- Item dimensions (WxDxH): 390.6 x 259.25 x 24 mm (15.38" x 10.21" x 0.94")
- Item weight: 1.4 kg (3.09 lb.)

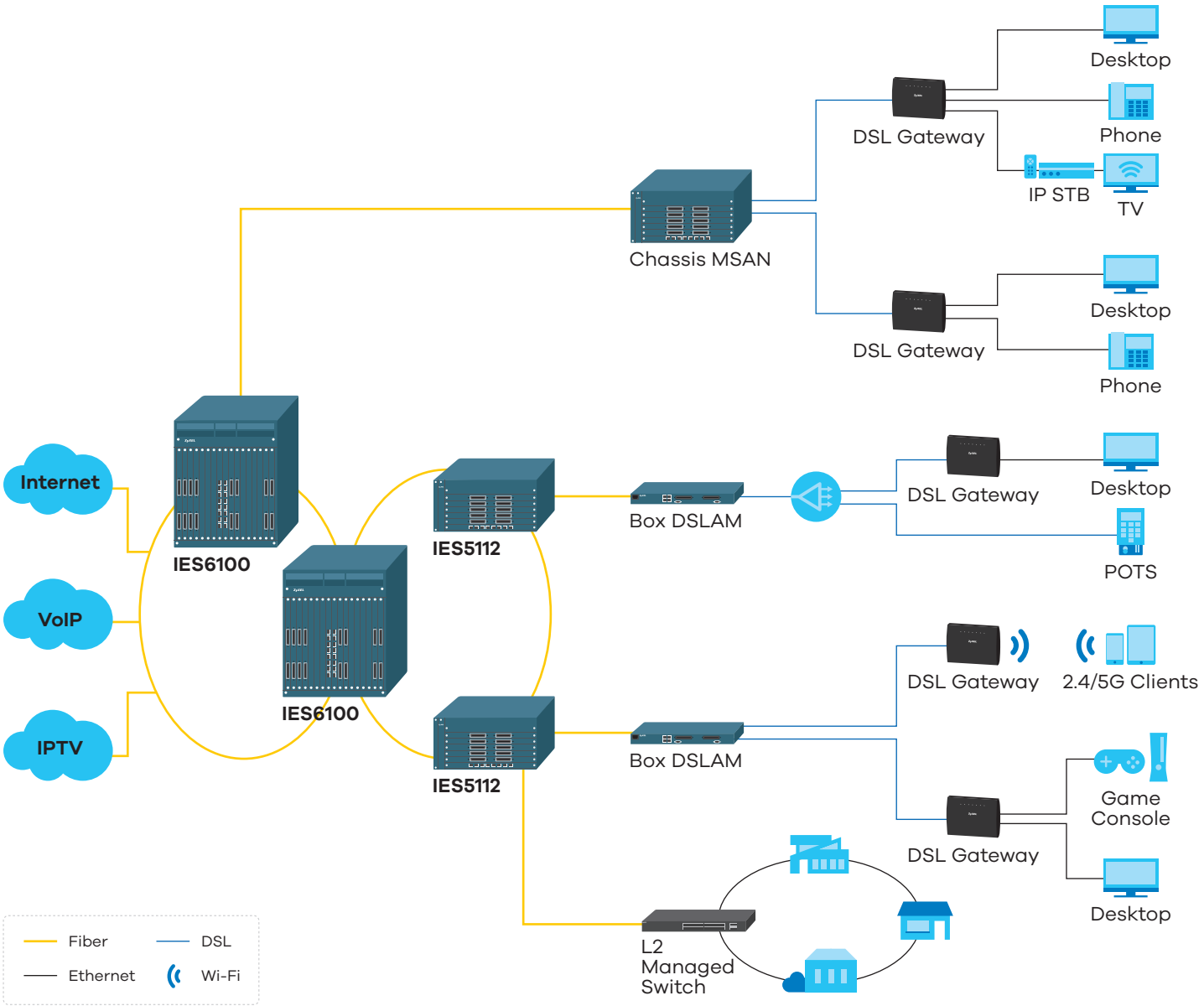
Environmental Specifications

- Operating environment:
  - Temperature: -40°C to 50°C (-40°F to 122°F)
  - Humidity: 10 to 95% (Non-condensing)
- Storage environment:
  - Temperature: -40°C to 50°C (-40°F to 122°F)
  - Humidity: 10 to 95% (Non-condensing)
- Power supply: -48V DC
- Full load power consumption:
  - IES6100M: 53W
  - IES-6000M: 66W
  - IES-5112M: 35W
  - IES-5106M: 23W
  - MSC1224GB: 33W
  - MSC1024GB: 23W
  - MSC1224GC: 40W
  - MSC1024GC: 36W
  - GLC1320G-55: 36W
  - VLC1424G-56: 68W
  - VLC1348G-51/53: 90W
  - ALC1372G-51: 94W
  - ALC1348G-51C: 166W
  - SLC1348G-22: 43W
  - VOP1372G-61: 143W

Certification

- CE
- UL 60950, CSA 60950
- FCC part 15 class A
- ITU-T K.20
- ETSI 300 019
- EN55022 class A
- EN55024 class A
- ETSI 300 386 Class A

Application Diagram



For more product information, visit us on the web at www.zyxel.com