IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

WIRELESS TRANSPORT LLC, Plaintiff, **v.** **ALE USA, INC.,** Defendant.	C.A. NO. **JURY TRIAL DEMANDED**

ORIGINAL COMPLAINT FOR PATENT INFRINGEMENT

1. This is an action for patent infringement in which Wireless Transport LLC makes the following allegations against ALE USA, Inc.

PARTIES

2. Plaintiff Wireless Transport LLC ("Plaintiff" or "Wireless Transport") is a Delaware limited liability company with its principal place of business at 16192 Coastal Highway, Lewes, DE 19959.

3. On information and belief, ALE USA, Inc ("Defendant" or "ALE") is a corporation organized and existing under the laws of the State of Delaware, which can be served through its registered agent Corporation Service Company, 251 Little Falls Drive, Wilmington, DE, 19808.

JURISDICTION AND VENUE

4. This action arises under the patent laws of the United States, Title 35 of the United States Code. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

5. Venue is proper in this district under 28 U.S.C. §§ 1391(c) and 1400(b). On information and belief, Defendant is incorporated in the State of Delaware, and, thus, resides in the State of Delaware for the purposes of 28 U.S.C. § 1400(b).

6. On information and belief, Defendant is subject to this Court's specific and general personal jurisdiction pursuant to due process and/or the Delaware Long Arm Statute, due at least to its substantial business in this forum, including: (i) at least a portion of the infringements alleged herein; and (ii) regularly doing or soliciting business, engaging in other persistent courses of conduct, and/or deriving substantial revenue from goods and services provided to individuals in Delaware and in this Judicial District.

COUNT I
INFRINGEMENT OF U.S. PATENT NO. 6,563,813

7. Plaintiff is the owner of United States Patent No. 6,563,813 ("the '813 patent") entitled "Wireless Transport Protocol." The '813 Patent issued on May 13, 2003. A true and correct copy of the '813 Patent is attached as Exhibit A.

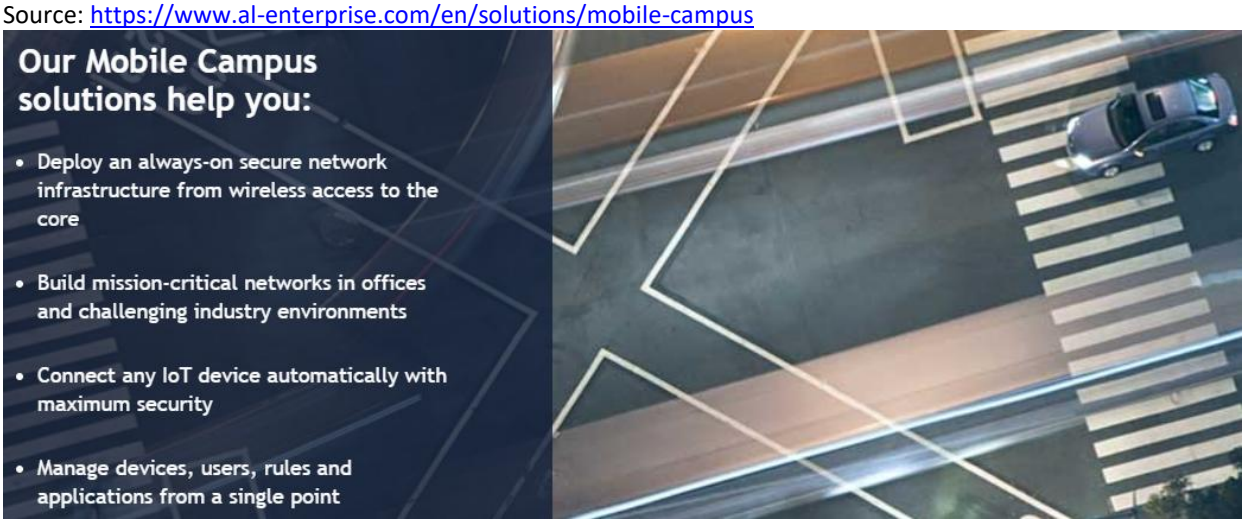
8. Defendant owns, uses, operates, advertises, controls, sells, and otherwise provides products and/or services that infringe the '813 patent. The '813 patent provides, among other things, " A communication system comprising: a wireless client; a wireless network; a land-line client; a land-line network; and a network backbone interfacing said land-line network and said wireless network to allow data packets to be exchanged between said wireless client and said land-line client, said communication system using a wireless transport layer protocol for data frame transmission over said land-line and wireless networks, each data frame including connection handling information specifying at least one data transport connection to be used to transmit data between said wireless client and said land-line client over said wireless and land-line networks; connection addressing information; a user data field including a data packet to be transmitted from one client to another client; and at least one sequencing field identifying the last packet received by the client that is transmitting a current data packet."

9. Defendant directly and/or through intermediaries, made, has made, used, imported, provided, supplied, distributed, sold, and/or offered for sale products and/or services that infringed one or more claims of the '813 patent, including at least Claim 6, in this district and elsewhere in the United States. For example, but without limitation, Mobile Campus solutions forms a communication system within the meaning of the '813 Patent. By making, using, importing, offering for sale, and/or selling such products and services, and all like

products and services, Defendant has injured Plaintiff and is thus liable for infringement of the '813 patent pursuant to 35 U.S.C. § 271.

10. ALE makes, uses, sells and/or offers for sale a communication system. For example, ALE provides Mobile Campus solutions ("a communication system") which integrates WLAN network products including WLAN Access Points and WLAN Controllers.

Source: https://www.al-enterprise.com/en/solutions/mobile-campus



Source: https://www.al-enterprise.com/en/solutions/mobile-campus

Enter a next-generation campus solution

"The ongoing digital transformation of the enterprise has elevated the importance of the network to business operations."

IDC Analyst

Tolly Wi-Fi 6 Podcast

The ALE Mobile Campus solution is a state-of-the-art converged network, built on a comprehensive set of intelligent network equipment and management software.

Our campus portfolio includes wireless access points, wireless controllers, access switches, core switches, wide area network (WAN) routers and management servers - all specifically geared for network convergence and performance.

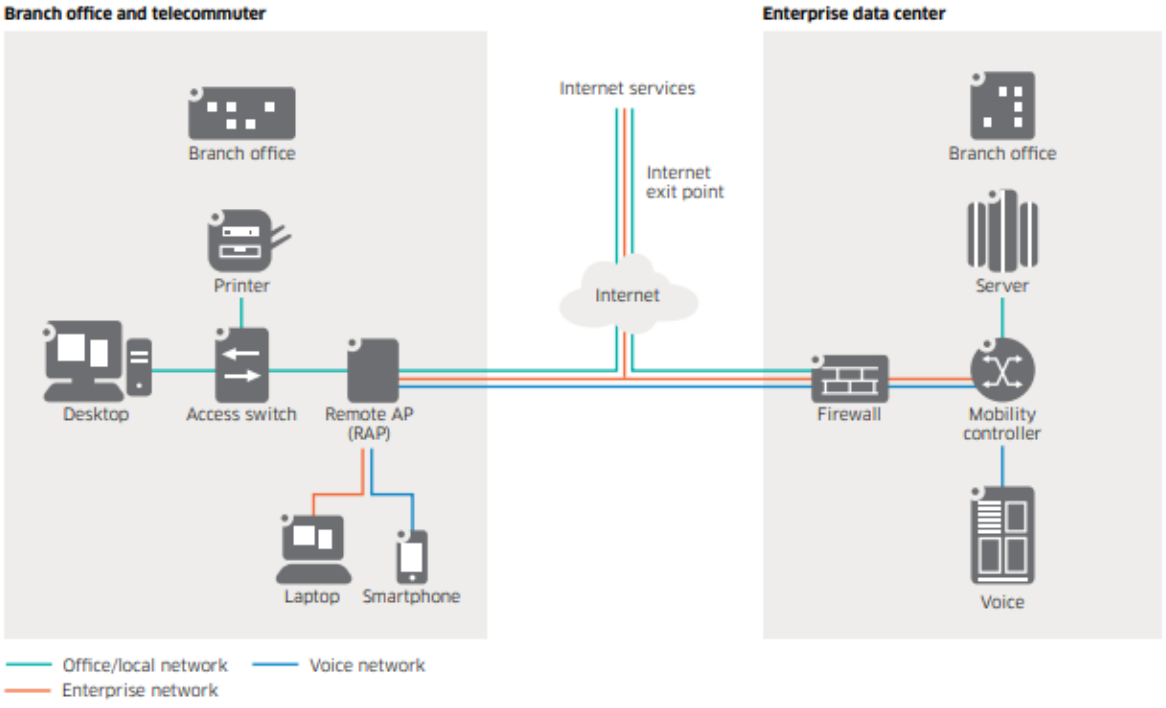
It's based on four key technology innovations:

- **Unified Access**
- **Intelligent Fabric** (iFab)
- Smart Analytics
- **IoT containment**

The Mobile Campus can also be deployed as Infrastructure as a Service (IaaS). **Network on Demand (NoD)** is an IaaS model, provisioning wired and wireless LAN network infrastructure in a 'pay for what you use' consumption model. NoD is contracted through our **Business Partners** as part of their managed network service.

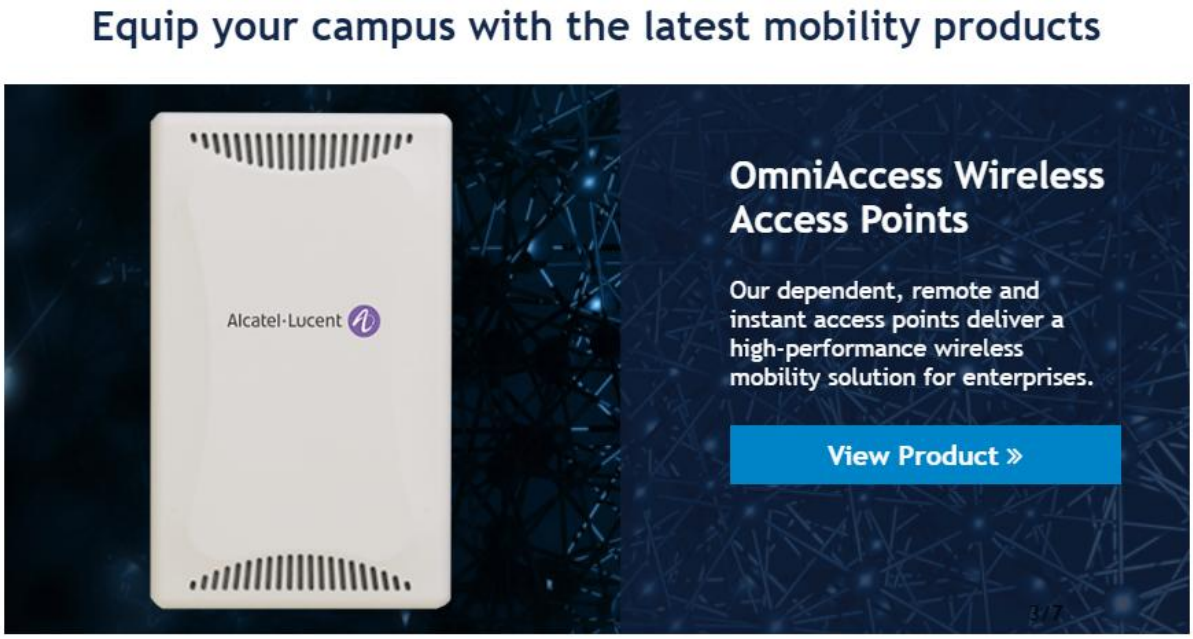
Source: https://www.al-enterprise.com/en/solutions/mobile-campus

Figure 4. OmniAccess RAPs provide secure mobile connectivity to branch and home offices.



Source: https://www.al-enterprise.com/-/media/assets/internet/documents/omniaccess-base-software-8-datasheet-en.pdf, page 10

11. ALE provides a communication system comprising a wireless client. For example, ALE's Mobile Campus solutions which when equipped with OmniAccess Wireless Access Points (such as OmniAccess Stellar AP 1251, 1101, 1201H, 1220, etc.) provide connectivity for devices ("wireless clients") which support IEEE 802.11 a/b/g/n/ac standard.



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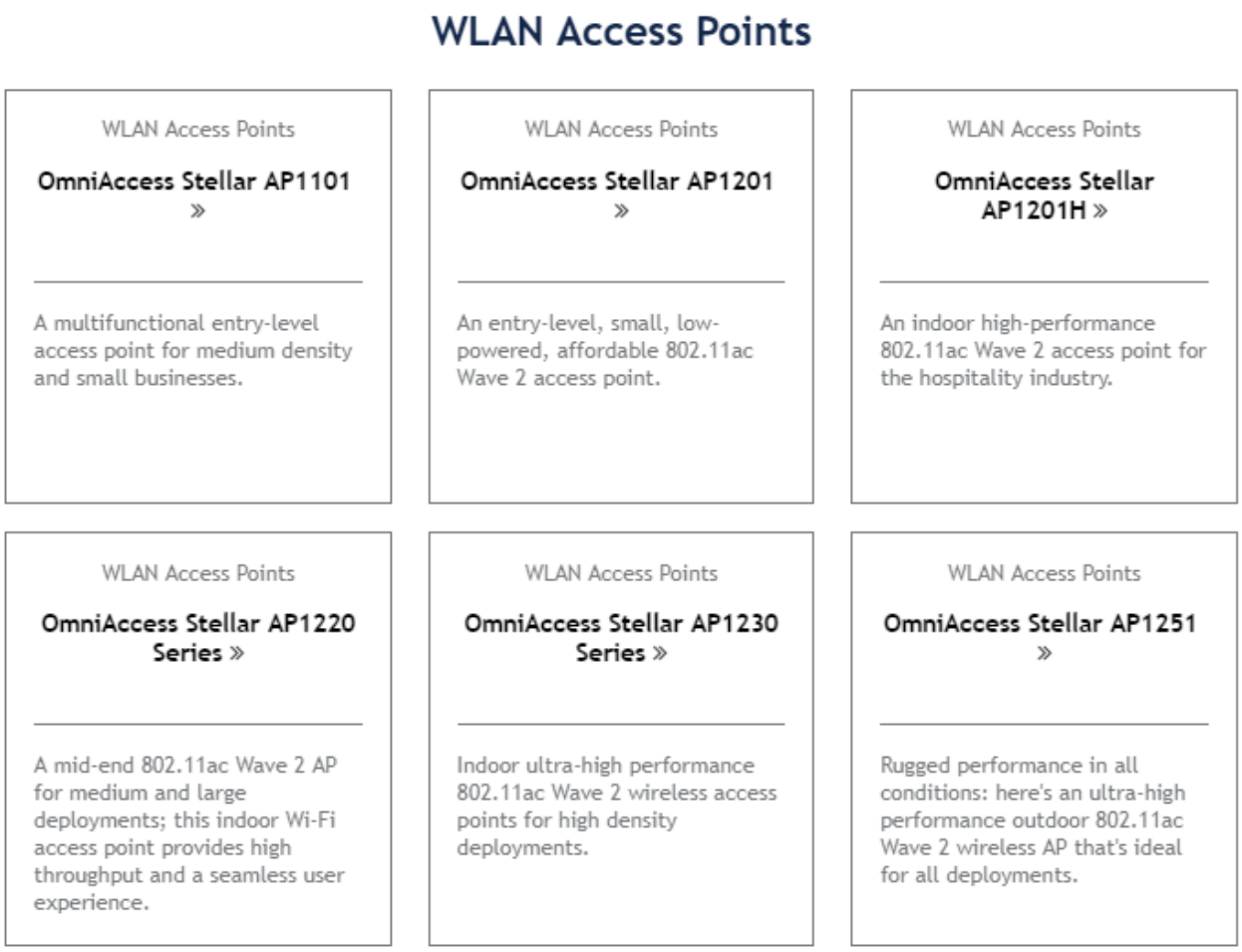


Source: https://www.al-enterprise.com/en/products/wlan

Product specifications

Radio specification

- AP type: Outdoor, dual radio, 5 GHz 802.11ac 2x2:2 MU-MIMO and 2.4 GHz 802.11n 2x2:2 MIMO
- 5 GHz: 2*2 MIMO with two spatial stream, up to 867 Mb/s wireless data rate
- 2.4 GHz: 2*2 MIMO with two spatial stream, up to 400 Mb/s wireless data rate to individual 2x2 VHT40 client devices (300 Mb/s for HT40 802.11n client devices)
- Supported frequency bands (country specific restrictions apply):
  - 2.400 to 2.4835 GHz
  - 5.150 to 5.250 GHz
  - 5.250 to 5.350 GHz
  - 5.470 to 5.725 GHz
  - 5.725 to 5.850 GHz
- Available channels: Dependent on configured regulatory domain
- Brazil: Frequency band 5.150 to 5.350 GHz is disabled. Maximum transmit power: 28dBm on 2.4GHz, 23dBm on 5GHz
- DFA (dynamic frequency adjustment) optimizes available channels and provides proper transmission power
- Short guard interval for 20 MHz, 40 MHz, and 80 MHz channels
- Transmit beam forming (TxBF) for increased signal reliability and range
- 802.11n/ac packet aggregation: Aggregated Mac Protocol Data Unit (A-MPDU), Aggregated Mac Service Data Unit (A-MSDU)
- Supported data rates (Mb/s):
  - 802.11b: 1, 2, 5.5, 11
  - 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54
  - 802.11n: 6.5 to 300 (MCS0 to MCS15)
  - 802.11ac: 6.5 to 867 (MCS0 to MCS9, NSS = 1 to 2)
- Supported modulation types:
  - 802.11b: BPSK, QPSK, CCK
  - 802.11a/g/n/ac: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
- 802.11n high-throughput (HT) support: HT 20/40
- 802.11ac very high throughput (VHT) support: VHT 20/40/80
- Advanced Cellular Coexistence (ACC Minimizes interference from 3G/4G cellular networks, distributed antenna systems, and commercial small cell/femtocell equipment

Interfaces

- 1x 10/100/1000Base-T auto-sensing (RJ-45) port, Power over Ethernet (PoE)
- 1x 10/100/1000Base-T auto-sensing (RJ-45) port
- 1x management console port (Micro-USB)
- Reset button: Factory reset

Visual Indicators (7 LEDs)

- For system and radio status
  - SYS ON: Power on and system running
  - SYS Flashing: Bootloader-OS loading or upgrading
  - 2.4G ON: 2.4GHz SSID created and running
  - 5G ON: 5GHz SSID created and running
  - ENET0 ON: Ethernet0 link UP
  - ENET1 ON: Ethernet1 link UP
  - RSRV0 Flashing: AP Location
  - RSRV1: Reserved

Antenna

- AP1251: Built-in 2×2:2 @ 2.4GHz, 2x2:2 @ 5GHz
- Integrated dual-band omni-directional antennas for 2x2 MIMO with maximum antenna gain of 8.46 dBi in 2.4 GHz and 6.62 dBi in 5 GHz.

Receive sensitivity (per chain)

	2.4 GHz	5 GHz
1 Mb/s	-96	
11 Mb/s	-88	
6 Mb/s	-92	-91
54 Mb/s	-74	-74
HT20 (MSC 0/8)	-91	-91
HT20 (MSC 7/15)	-71	-73
HT40 (MSC 0/8)	-88	-88
HT40 (MSC 7/15)	-68	-69
VHT20 (MSC 0)	-91	-91
VHT20 (MSC 8)	-67	-68
VHT40 (MSC 0)	-88	-88
VHT40 (MSC 9)	-63	-64
VHT80 (MCS0)		-85
VHT80 (MCS9)		-60

Maximum Transmit power (per chain)

	2.4 GHz	5 GHz
1 Mb/s	20 dBm	
11 Mb/s	20 dBm	
6 Mb/s	20 dBm	20 dBm
54 Mb/s	20 dBm	20 dBm
HT20 (MSC 0/8)	20 dBm	20 dBm
HT20 (MSC 7/15)	20 dBm	20 dBm
HT40 (MSC 0/8)	20 dBm	20 dBm
HT40 (MSC 7/15)	20 dBm	20 dBm
VHT20 (MSC 0)	20 dBm	20 dBm
VHT20 (MSC 8)	19 dBm	20 dBm
VHT40 (MSC 0)	20 dBm	20 dBm
VHT40 (MSC 9)	19 dBm	19 dBm
VHT80 (MCS0)		20 dBm
VHT80 (MCS9)		19 dBm

Chile: Regulatory compliance. Maximum transmit power of 150mW

Note: Maximum transmit power is limited by local regulatory settings.

Power

- Maximum (worst case) power consumption:
  - <11.8W (802.3af PoE)
  - Maximum power consumption in idle mode: 5.3 W
- Power over Ethernet (PoE):
  - 48 V DC (nominal) 802.3af source

Mounting

- Pole/wall mounting (mounting kit shipped by default with the AP)

Environmental

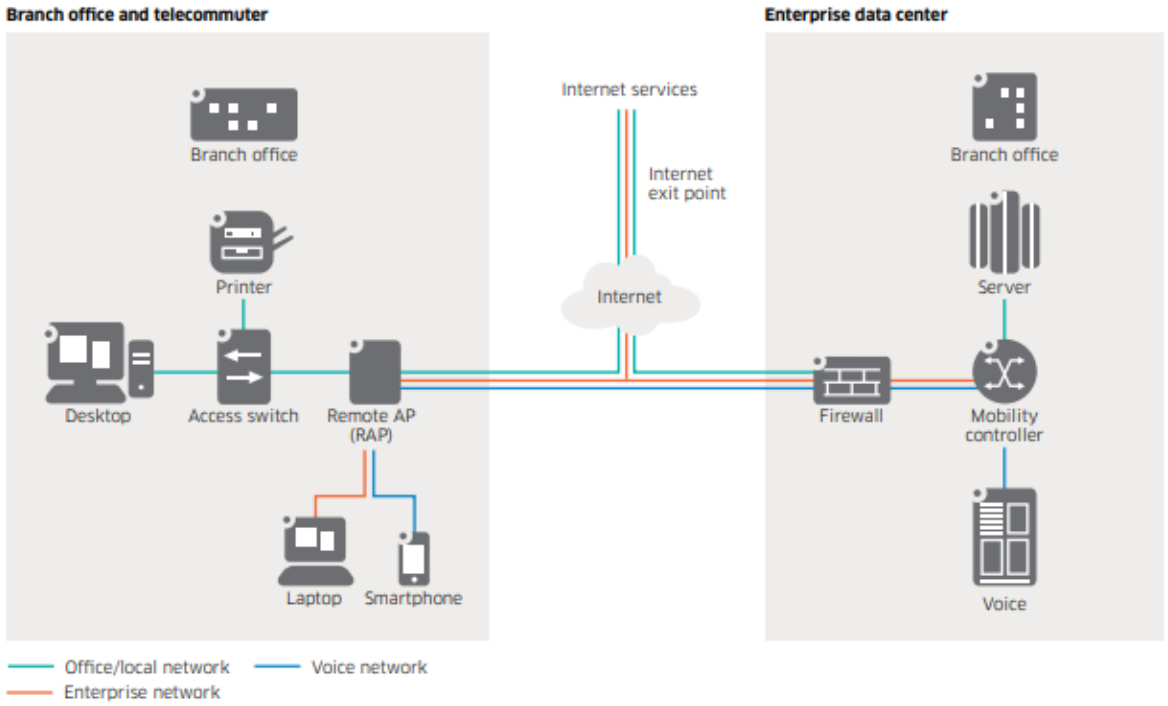
- Operating:
  - Temperature: -40°C to 65°C (-40°F to +149°F)
  - Humidity: 10% to 90% non-condensing
- Storage and transportation:
  - Temperature: -40°C to +85°C (-40°F to +185°F)
- Chassis rating: IP67
- Wind resistance:
  - Up to 100 MPH sustained winds
  - Up to 165 MPH wind gusts

Dimensions/weight

- Single AP excluding packing box and accessories:
  - 243 mm (W) x 243 mm (D) x 85 mm (H) -9.56" (W) x 9.56" (D) x 3.34" (H)
  - 2230 g/4.91 lb
- Single AP including packing box and accessories:
  - 344 mm (W) x 341 mm (D) x 220 mm (H) 10.32" (W) x 10.23" (D) x 8.66" (H)
  - 4025 g/8.87lb

Source: https://www.al-enterprise.com/-/media/assets/internet/documents/oaw-ap1251-datasheet-en.pdf, page 3

Figure 4. OmniAccess RAPs provide secure mobile connectivity to branch and home offices.



Source: https://www.al-enterprise.com/-/media/assets/internet/documents/omniaccess-base-software-8-datasheet-en.pdf, page 10

12. ALE provides a communication system comprising a wireless network. For example, the OmniAccess Wireless Access Points (such as OmniAccess Stellar AP 1251, 1101, 1201H, 1220, etc.) implement wireless networking standards (such as IEEE 802.11 (WLAN) standard on 2.4 GHz and 5 GHz band frequencies), thereby implementing a wireless network.

IEEE standard

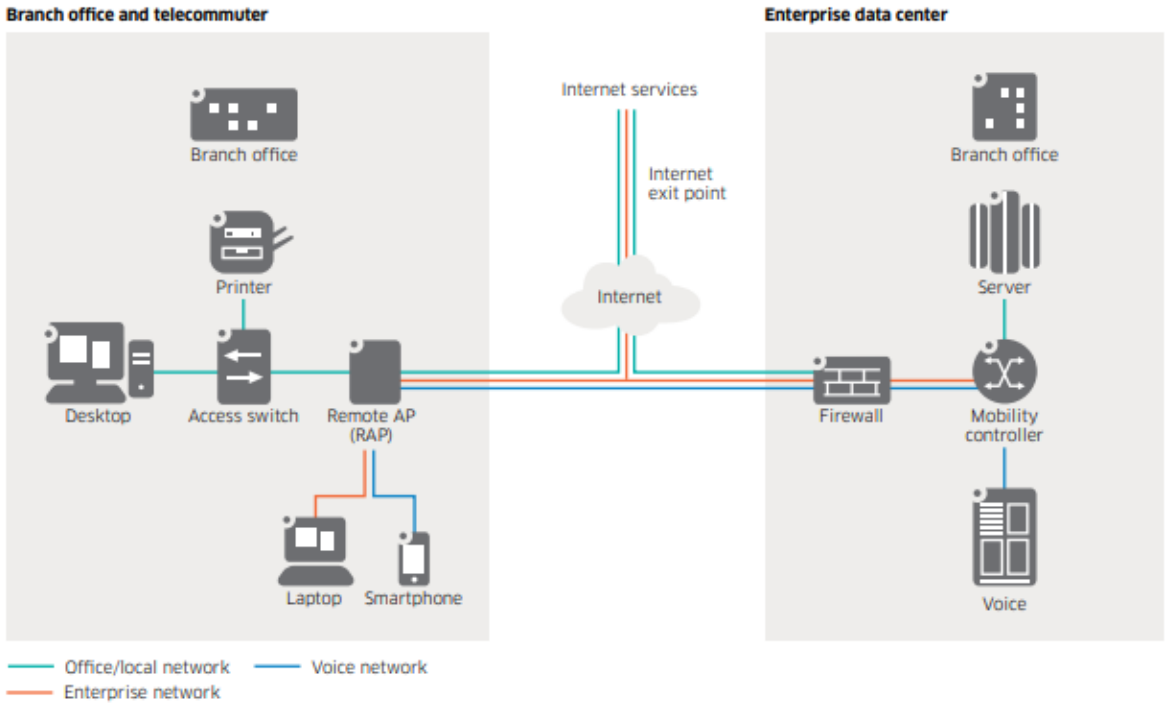
- IEEE 802.11a/b/g/n/ac Wave 2
- IEEE 802.11e WMM
- IEEE 802.11h, 802.11i, 802.11e QoS
- IEEE 802.1Q (VLAN tagging)
- 802.11k Radio Resource Management
- 802.11v BSS Transition Management
- 802.11r Fast Roaming

Regulatory & certification

- CB Scheme Safety, cTUVus
- Wi-Fi Alliance (WFA) certified 802.11a/b/g/n/ac
- FCC
- CE Marked
- RoHS, REACH, WEEE
- ASTM B117-07A, Salt spray testing per UL50 NEMA 4x
- EMI and susceptibility (Class B)

Source: https://www.al-enterprise.com/-/media/assets/internet/documents/oaw-ap1251-datasheet-en.pdf, page 4

Figure 4. OmniAccess RAPs provide secure mobile connectivity to branch and home offices.



Source: https://www.al-enterprise.com/-/media/assets/internet/documents/omniaccess-base-software-8-datasheet-en.pdf, page 10

13. ALE provides a communication system comprising a land-line client. For example, the Mobile Campus solutions comprises an OmniSwitch 6350 Gigabit Ethernet LAN Switch, and/or OmniAccess WLAN Controllers to support a land-line client.

Supported standards

- IEEE 802.1D (STP)
- IEEE 802.1p (CoS)
- IEEE 802.1Q (VLANs)
- IEEE 802.1s (MSTP)
- IEEE 802.1w (RSTP)
- IEEE 802.1X (Port-Based Network Access Protocol)
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (Fast Ethernet)
- IEEE 802.3x (Flow Control)
- IEEE 802.3z (Gigabit Ethernet)
- IEEE 802.3ab (1000Base-T)
- IEEE 802.3ac (VLAN Tagging)
- IEEE 802.3ad (Link Aggregation)
- IEEE 802.3af (Power-over-Ethernet)
- IEEE 802.3at (Power-over-Ethernet)
- IEEE 802.3az (Energy Efficient Ethernet)

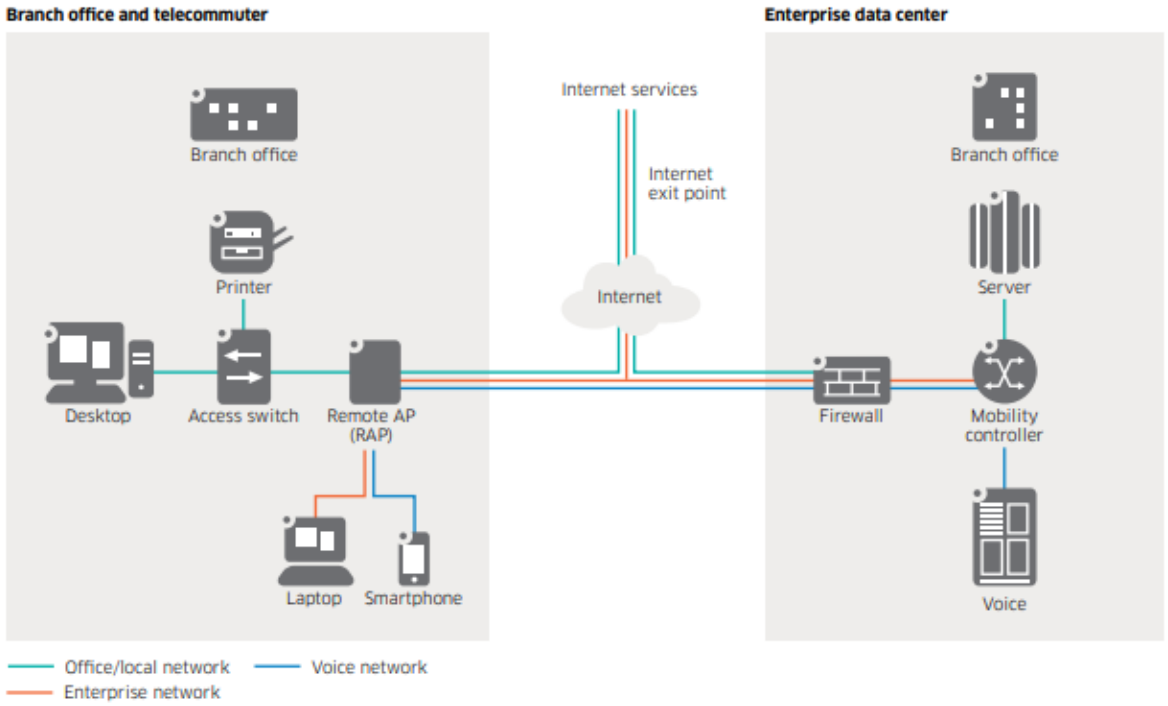
Source: https://www.al-enterprise.com/-/media/assets/internet/documents/omniswitch-6350-family-datasheet.pdf, page 7

INTERFACES AND INDICATORS

FEATURES	4005	4010	4030
Form factor/footprint	Compact	1 rack unit	1 rack unit
Auto-negotiating 10/100/1000BASE-T	4	16	8 (combo)
Gigabit Ethernet ports (GBIC or SFP)	N/A	2 SFP	8 (combo)
USB 2.0	Yes	Yes (2)	Yes
Management/status LEDs	Yes	Yes	Yes
LINK/ACT and status LEDs	No	No	Yes
LCD panel and navigation buttons	No	Yes	Yes
Console port	Yes (mini USB/RJ-45)	Yes (mini USB/RJ-45)	Yes (mini USB/RJ-45)
Out-of-band management port	No	Yes	Yes

Source: https://www.al-enterprise.com/-/media/assets/internet/documents/4000-series-datasheet-en.pdf, page 2

Figure 4. OmniAccess RAPs provide secure mobile connectivity to branch and home offices.



Source: https://www.al-enterprise.com/-/media/assets/internet/documents/omniaccess-base-software-8-datasheet-en.pdf, page 10

14. ALE provides a communication system comprising a land-line network. For example, the OmniSwitch 6350 Gigabit Ethernet LAN Switch, and/or OmniAccess WLAN Controllers support IEEE 802.3 (Ethernet) wired network standard.

Supported standards

- IEEE 802.1D (STP)
- IEEE 802.1p (CoS)
- IEEE 802.1Q (VLANs)
- IEEE 802.1s (MSTP)
- IEEE 802.1w (RSTP)
- IEEE 802.1X (Port-Based Network Access Protocol)
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (Fast Ethernet)
- IEEE 802.3x (Flow Control)
- IEEE 802.3z (Gigabit Ethernet)
- IEEE 802.3ab (1000Base-T)
- IEEE 802.3ac (VLAN Tagging)
- IEEE 802.3ad (Link Aggregation)
- IEEE 802.3af (Power-over-Ethernet)
- IEEE 802.3at (Power-over-Ethernet)
- IEEE 802.3az (Energy Efficient Ethernet)

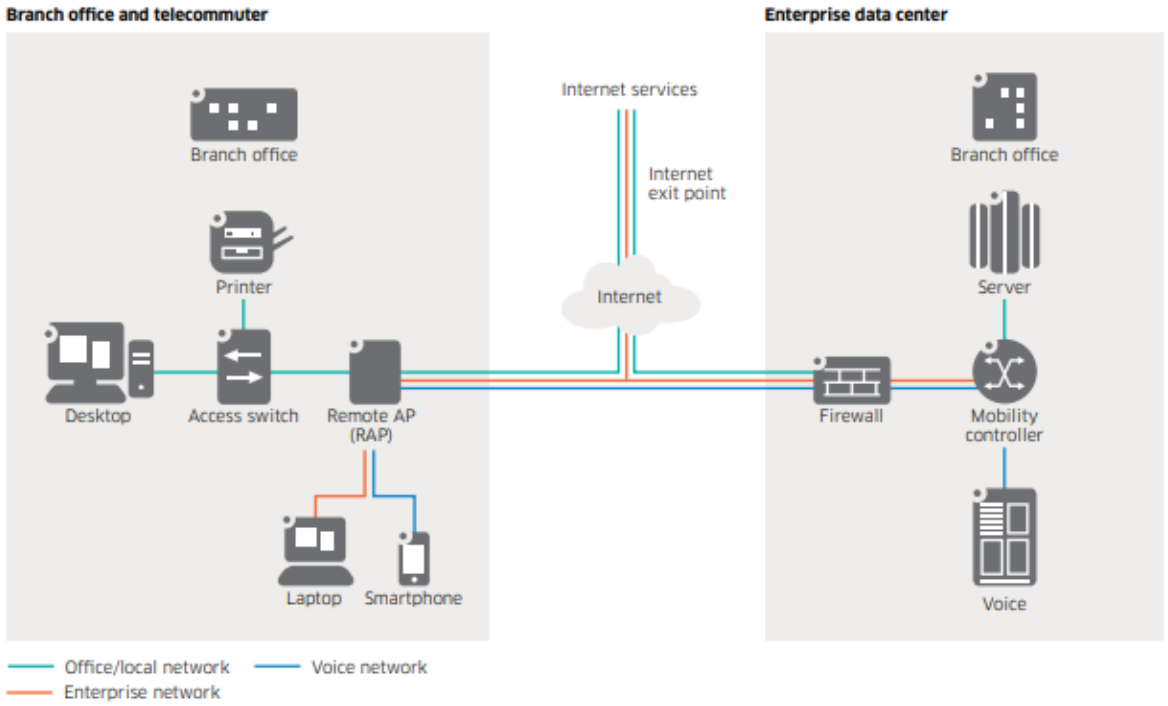
Source: https://www.al-enterprise.com/-/media/assets/internet/documents/omniswitch-6350-family-datasheet.pdf, page 7

INTERFACES AND INDICATORS

FEATURES	4005	4010	4030
Form factor/footprint	Compact	1 rack unit	1 rack unit
Auto-negotiating 10/100/1000BASE-T	4	16	8 (combo)
Gigabit Ethernet ports (GBIC or SFP)	N/A	2 SFP	8 (combo)
USB 2.0	Yes	Yes (2)	Yes
Management/status LEDs	Yes	Yes	Yes
LINK/ACT and status LEDs	No	No	Yes
LCD panel and navigation buttons	No	Yes	Yes
Console port	Yes (mini USB/RJ-45)	Yes (mini USB/RJ-45)	Yes (mini USB/RJ-45)
Out-of-band management port	No	Yes	Yes

Source: https://www.al-enterprise.com/-/media/assets/internet/documents/4000-series-datasheet-en.pdf, page 2

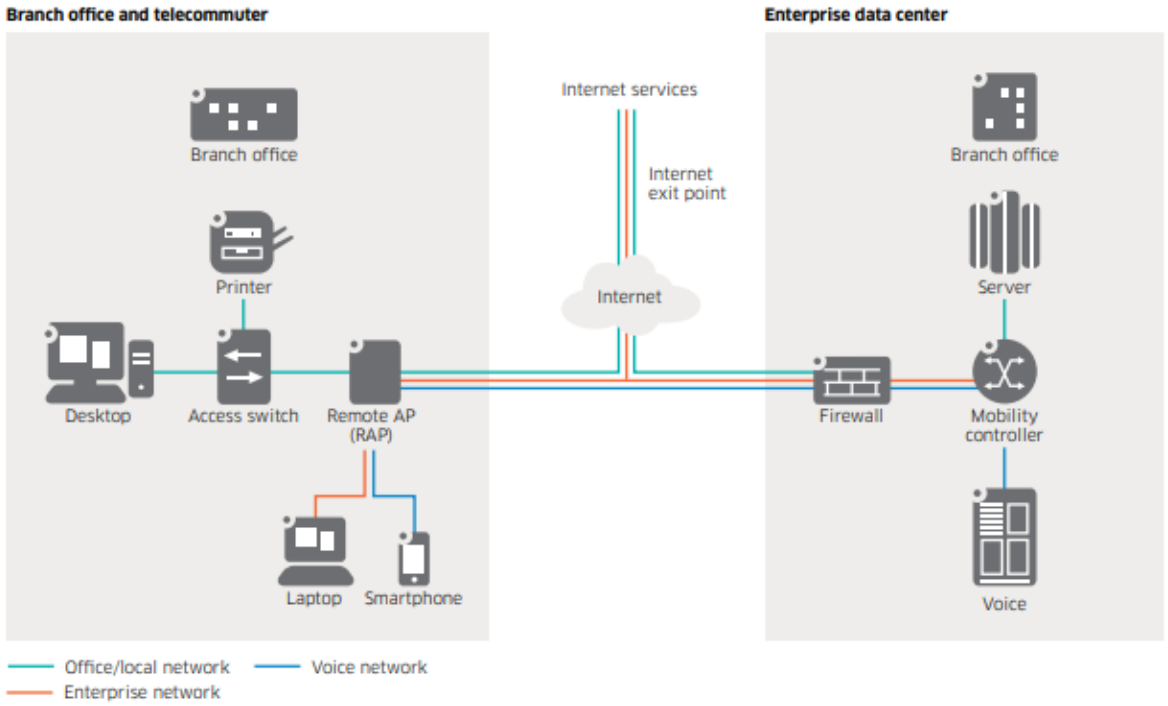
Figure 4. OmniAccess RAPs provide secure mobile connectivity to branch and home offices.



Source: https://www.al-enterprise.com/-/media/assets/internet/documents/omniaccess-base-software-8-datasheet-en.pdf, page 10

15. ALE provides a communication system comprising a network backbone interfacing said land-line network and said wireless network to allow data packets to be exchanged between said wireless client and said land-line client. For example, ALE provides WLAN network products (including WLAN Access Points such as OmniAccess Stellar AP 1251, 1101, 1201H, 1220, etc., and WLAN Controllers such as 4000 series controller) for interfacing a land-line network and a wireless network. The WLAN network products support TCP/IP (Transmission Control Protocol/Internet Protocol) which allow exchange of packets between wireless network and land-line/wired network.

Figure 4. OmniAccess RAPs provide secure mobile connectivity to branch and home offices.



Source: https://www.al-enterprise.com/-/media/assets/internet/documents/omniaccess-base-software-8-datasheet-en.pdf, page 10

Our dependent, remote and instant access points deliver a high-performance wireless mobility solution for enterprises.

Small and lightweight, Alcatel-Lucent OmniAccess Access Points work with OmniAccess WLAN switches/controllers to provide a high performance wireless mobility solution for enterprises. They can be securely deployed in a variety of locations such as on walls, cubicles, desktops, and in the ceiling, and the AP antenna diversity allows for the best possible signal processing using dual, omni-directional antennas.

OmniAccess APs have an extended lifespan because they automatically configure themselves across any L2/L3 network using discovery, allowing easy upgrades when new features, capabilities, or standards emerge.

Click here to join the community

Source: https://www.al-enterprise.com/en/products/wlan/omniaccess-wireless-access-points

Source: https://www.al-enterprise.com/en/products/wlan/omniaccess-wlan-controllers

2. TCP/IP Overview

The generic term "TCP/IP" usually means anything and everything related to the specific protocols of TCP and IP. It can include other protocols, applications, and even the network medium. A sample of these protocols are: UDP, ARP, and ICMP. A sample of these applications are: TELNET, FTP, and rcp. A more accurate term is "internet technology". A network that uses internet technology is called an "internet".

2.1 Basic Structure

To understand this technology you must first understand the following logical structure:

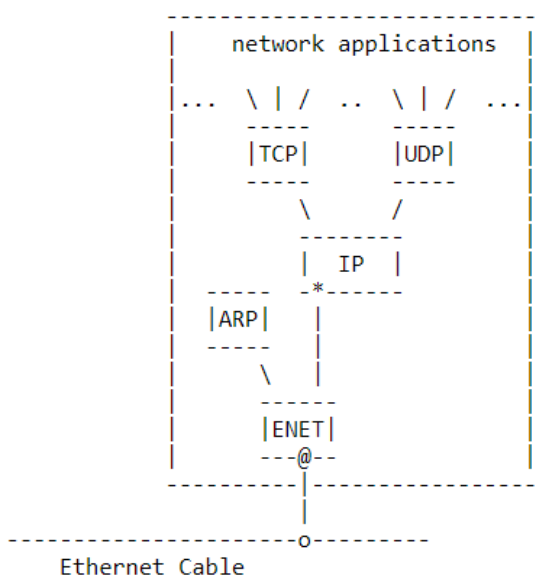


Figure 1. Basic TCP/IP Network Node

Source: https://tools.ietf.org/html/rfc1180, page 1

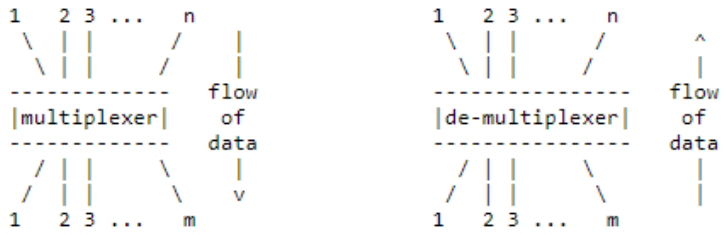


Figure 4. n-to-m multiplexer and m-to-n de-multiplexer

It performs this multiplexing in either direction to accommodate incoming and outgoing data. An IP module with more than 1 network interface is more complex than our original example in that it can forward data onto the next network. Data can arrive on any network interface and be sent out on any other.

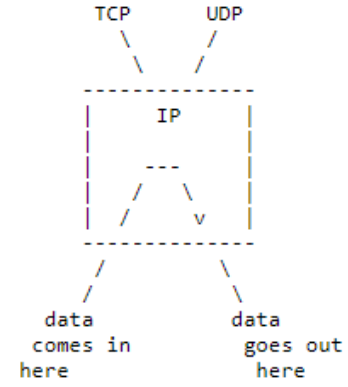


Figure 5. Example of IP Forwarding a IP Packet

The process of sending an IP packet out onto another network is called "forwarding" an IP packet. A computer that has been dedicated to the task of forwarding IP packets is called an "IP-router".

As you can see from the figure, the forwarded IP packet never touches the TCP and UDP modules on the IP-router. Some IP-router implementations do not have a TCP or UDP module.

Source: https://tools.ietf.org/html/rfc1180, page 5

INTERFACES AND INDICATORS

FEATURES	4005	4010	4030
Form factor/footprint	Compact	1 rack unit	1 rack unit
Auto-negotiating 10/100/1000BASE-T	4	16	8 (combo)
Gigabit Ethernet ports (GBIC or SFP)	N/A	2 SFP	8 (combo)
USB 2.0	Yes	Yes (2)	Yes
Management/status LEDs	Yes	Yes	Yes
LINK/ACT and status LEDs	No	No	Yes
LCD panel and navigation buttons	No	Yes	Yes
Console port	Yes (mini USB/RJ-45)	Yes (mini USB/RJ-45)	Yes (mini USB/RJ-45)
Out-of-band management port	No	Yes	Yes

Source: https://www.al-enterprise.com/-/media/assets/internet/documents/4000-series-datasheet-en.pdf, page 2

The Alcatel-Lucent Enterprise 4005, 4010 and 4030 Services Controllers support 16, 32 and 64 access points (APs), respectively. These controllers also unify policy management for wired and wireless networks, making it simple and cost-effective to create a unified workplace at branch offices. Wireline access for branch offices is provided by switches such as the Alcatel-Lucent OmniSwitch™ 6850E Stackable LAN Switch, the OmniSwitch 6450 Stackable LAN Switches and OmniSwitch 6250 Stackable Fast Ethernet Switches.

Capable of handling up to 4000 users, the 4000 series performs stateful firewall policy enforcement at up to 8 Gb/s. Secure IP tunnels protect branch traffic across the public and private transport network to the cloud and headquarters. Local bridging can be performed, depending on end-user applications or IT traffic forwarding requirements.

The 4000 series also supports the Alcatel-Lucent Next-Generation Mobility Firewall with AppRF™ technology, which continuously evaluates app usage and performance, and makes configuration changes in real time to ensure optimal bandwidth, priority and network paths in branch offices.

This ensures the best possible app experience in the branch, even for apps that are hidden as encrypted or web traffic. And it can obtain unprecedented insight into over 1500 apps, including cloud- and web-based apps like Microsoft® Lync™, Microsoft SharePoint™, Box, GoToMeeting™ and Salesforce.com™.

A real-time dashboard makes it easy to identify and correct quality-of-service tags, load-balance specific apps across APs, adjust RF management and roaming parameters for latency-sensitive apps, and apply bandwidth contracts per app or group of apps.

The 4000 series supports other enterprise-critical capabilities, such as authentication, encryption, VPN connections, IPv4 and IPv6 services, the Policy Enforcement Firewall™, Adaptive Radio Management™ and ClientMatch™ technologies, and RFProtect™ spectrum analysis and wireless intrusion protection.

PRODUCT SUMMARY

- 4005 Controller is a compact, fanless entry-level branch platform that can be powered by a power-over-Ethernet (PoE) switch.
- 4010 Controller is designed for mid-sized branch deployments that require several PoE and PoE+ switch ports.
- 4030 Controller is ideal for mid- to large-sized branch deployments that require unprecedented scale and performance.

FEATURES

- AppRF technology, which continuously evaluates app usage and performance.
- ClientMatch dynamically optimizes Wi-Fi client perfor¬mance as users roam and RF conditions change.
- Remote spectrum analysis to identify sources of RF interference.

BENEFITS

- Ensures the best possible app experience in the branch, for over 1500 apps
- Improved Wi-Fi quality and support high densities of mobile devices.
- Delivers best-in-class RF management

Source: https://www.al-enterprise.com/-/media/assets/internet/documents/4000-series-datasheet-en.pdf, page 1

IEEE standard

- IEEE 802.11a/b/g/n/ac Wave 2
- IEEE 802.11e WMM
- IEEE 802.11h, 802.11i, 802.11e QoS
- IEEE 802.1Q (VLAN tagging)
- 802.11k Radio Resource Management
- 802.11v BSS Transition Management
- 802.11r Fast Roaming

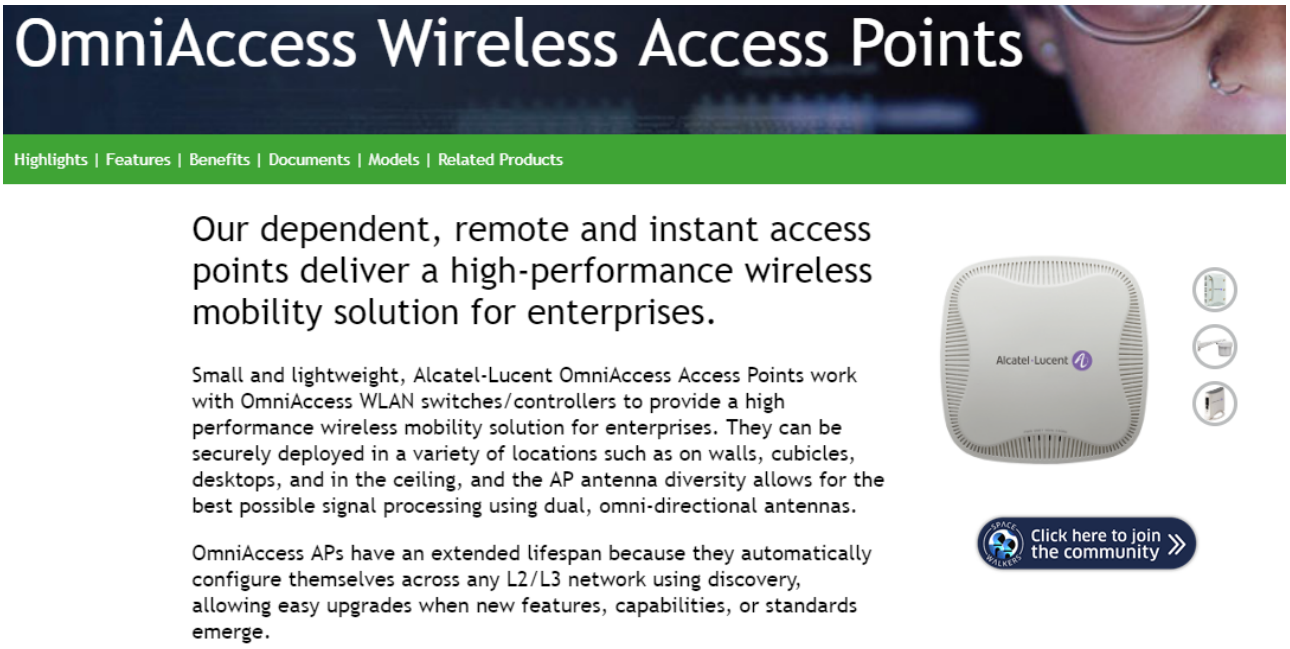
Regulatory & certification

- CB Scheme Safety, cTUVus
- Wi-Fi Alliance (WFA) certified 802.11a/b/g/n/ac
- FCC
- CE Marked
- RoHS, REACH, WEEE
- ASTM B117-07A, Salt spray testing per UL50 NEMA 4x
- EMI and susceptibility (Class B)

Source: https://www.al-enterprise.com/-/media/assets/internet/documents/oaw-ap1251-datasheet-en.pdf, page 4

16. ALE provides a communication system which uses a wireless transport layer protocol for data frame transmission over said land-line and wireless networks, each data frame including connection handling information specifying at least one data transport connection to be used to transmit data between said wireless client and said land-line client over said wireless and land-line networks. For example, ALE provides WLAN network products (including WLAN Access Points such as OmniAccess Stellar AP 1251, 1101, 1201H, 1220, etc., and WLAN

Controllers such as 4000 series controller) which support wireless protocols such as TCP/IP for transmission of data packets (such as Ethernet frame, IP packet, UDP datagram, and TCP segment and/or application message) over land-line and wireless networks. Further, TCP/IP data frames (such as Ethernet frame) contain connection handling information such as the destination address, source address ("connection addressing information"), type field and data.



Source: https://www.al-enterprise.com/en/products/wlan/omniaccess-wireless-access-points

Source: https://www.al-enterprise.com/en/products/wlan/omniaccess-wlan-controllers

IEEE standard

- IEEE 802.11a/b/g/n/ac Wave 2
- IEEE 802.11e WMM
- IEEE 802.11h, 802.11i, 802.11e QoS
- IEEE 802.1Q (VLAN tagging)
- 802.11k Radio Resource Management
- 802.11v BSS Transition Management
- 802.11r Fast Roaming

Regulatory & certification

- CB Scheme Safety, cTUVus
- Wi-Fi Alliance (WFA) certified 802.11a/b/g/n/ac
- FCC
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- RoHS, REACH, WEEE
- ASTM B117-07A, Salt spray testing per UL50 NEMA 4x
- EMI and susceptibility (Class B)

Source: https://www.al-enterprise.com/-/media/assets/internet/documents/oaw-ap1251-datasheet-en.pdf, page 4

INTERFACES AND INDICATORS

FEATURES	4005	4010	4030
Form factor/footprint	Compact	1 rack unit	1 rack unit
Auto-negotiating 10/100/1000BASE-T	4	16	8 (combo)
Gigabit Ethernet ports (GBIC or SFP)	N/A	2 SFP	8 (combo)
USB 2.0	Yes	Yes (2)	Yes
Management/status LEDs	Yes	Yes	Yes
LINK/ACT and status LEDs	No	No	Yes
LCD panel and navigation buttons	No	Yes	Yes
Console port	Yes (mini USB/RJ-45)	Yes (mini USB/RJ-45)	Yes (mini USB/RJ-45)
Out-of-band management port	No	Yes	Yes

Source: https://www.al-enterprise.com/-/media/assets/internet/documents/4000-series-datasheet-en.pdf, page 2

2.2 Terminology

The name of a unit of data that flows through an internet is dependent upon where it exists in the protocol stack. In summary: if it is on an Ethernet it is called an Ethernet frame; if it is between the Ethernet driver and the IP module it is called a IP packet; if it is between the IP module and the UDP module it is called a UDP datagram; if it is between the IP module and the TCP module it is called a TCP segment (more generally, a transport message); and if it is in a network application it is called a application message.

These definitions are imperfect. Actual definitions vary from one publication to the next. More specific definitions can be found in RFC 1122, section 1.3.3.

A driver is software that communicates directly with the network interface hardware. A module is software that communicates with a driver, with network applications, or with another module.

Source: https://tools.ietf.org/html/rfc1180, page 2

3. Ethernet

This section is a short review of Ethernet technology.

An Ethernet frame contains the destination address, source address, type field, and data.

An Ethernet address is 6 bytes. Every device has its own Ethernet address and listens for Ethernet frames with that destination address. All devices also listen for Ethernet frames with a wild-card destination address of "FF-FF-FF-FF-FF-FF" (in hexadecimal), called a "broadcast" address.

Ethernet uses CSMA/CD (Carrier Sense and Multiple Access with Collision Detection). CSMA/CD means that all devices communicate on a single medium, that only one can transmit at a time, and that they can all receive simultaneously. If 2 devices try to transmit at the same instant, the transmit collision is detected, and both devices wait a random (but short) period before trying to transmit again.

Source: https://tools.ietf.org/html/rfc1180, page 7

4. ARP

When sending out an IP packet, how is the destination Ethernet address determined?

ARP (Address Resolution Protocol) is used to translate IP addresses to Ethernet addresses. The translation is done only for outgoing IP packets, because this is when the IP header and the Ethernet header are created.

4.1 ARP Table for Address Translation

The translation is performed with a table look-up. The table, called the ARP table, is stored in memory and contains a row for each computer. There is a column for IP address and a column for Ethernet address. When translating an IP address to an Ethernet address, the table is searched for a matching IP address. The following is a simplified ARP table:

IP address	Ethernet address
223.1.2.1	08-00-39-00-2F-C3
223.1.2.3	08-00-5A-21-A7-22
223.1.2.4	08-00-10-99-AC-54

TABLE 1. Example ARP Table

The human convention when writing out the 4-byte IP address is each byte in decimal and separating bytes with a period. When writing out the 6-byte Ethernet address, the conventions are each byte in hexadecimal and separating bytes with either a minus sign or a colon.

The ARP table is necessary because the IP address and Ethernet address are selected independently; you can not use an algorithm to translate IP address to Ethernet address. The IP address is selected by the network manager based on the location of the computer on the internet. When the computer is moved to a different part of an internet, its IP address must be changed. The Ethernet address is selected by the manufacturer based on the Ethernet address space licensed by the manufacturer. When the Ethernet hardware interface board changes, the Ethernet address changes.

Source: https://tools.ietf.org/html/rfc1180#page-2, page 8

application, the TCP module, and the IP module. At this point the IP packet has been constructed and is ready to be given to the Ethernet driver, but first the destination Ethernet address must be determined.

The ARP table is used to look-up the destination Ethernet address.

4.3 ARP Request/Response Pair

But how does the ARP table get filled in the first place? The answer is that it is filled automatically by ARP on an "as-needed" basis.

Two things happen when the ARP table can not be used to translate an address:

1. An ARP request packet with a broadcast Ethernet address is sent out on the network to every computer.

2. The outgoing IP packet is queued.

Every computer's Ethernet interface receives the broadcast Ethernet frame. Each Ethernet driver examines the Type field in the Ethernet frame and passes the ARP packet to the ARP module. The ARP request packet says "If your IP address matches this target IP address, then please tell me your Ethernet address". An ARP request packet looks something like this:

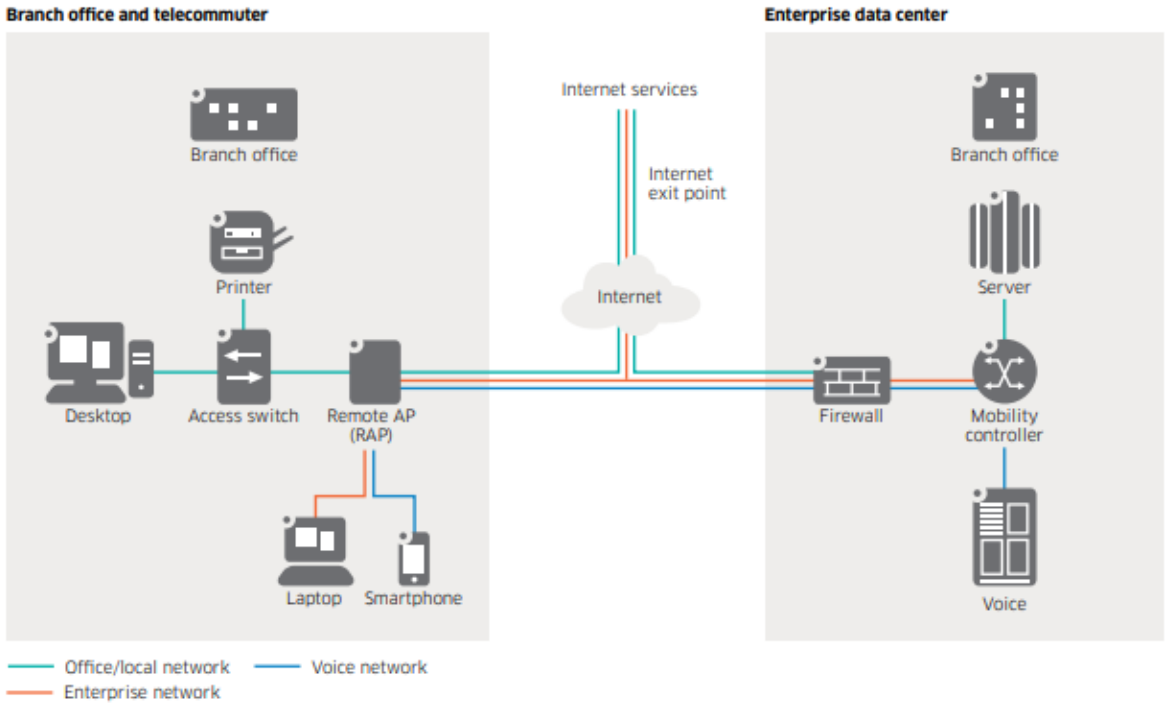
Sender IP Address	223.1.2.1
Sender Enet Address	08-00-39-00-2F-C3
Target IP Address	223.1.2.2
Target Enet Address	<blank>

TABLE 2. Example ARP Request

Each ARP module examines the IP address and if the Target IP address matches its own IP address, it sends a response directly to the source Ethernet address. The ARP response packet says "Yes, that target IP address is mine, let me give you my Ethernet address". An ARP response packet has the sender/target field contents swapped as compared to the request. It looks something like this:

Source: https://tools.ietf.org/html/rfc1180#page-2, page 9

Figure 4. OmniAccess RAPs provide secure mobile connectivity to branch and home offices.

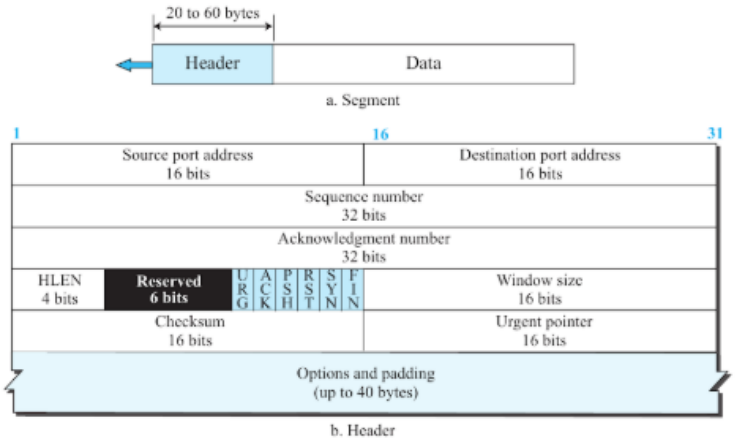


Source: https://www.al-enterprise.com/-/media/assets/internet/documents/omniaccess-base-software-8-datasheet-en.pdf, page 10

17. ALE provides a user data field including a data packet to be transmitted from one client to another client. For example, the WLAN network products (including WLAN Access Points such as OmniAccess Stellar AP 1251, 1101, 1201H, 1220, etc., and WLAN Controllers such as 4000 series controller) support wireless transport protocol such as TCP/IP. The protocol allows transmission of user data between wired and wireless devices ("client") in the form of TCP segments/data packets.

there are no options and up to 60 bytes if it contains options. We will discuss some of the header fields in this section. The meaning and purpose of these will become clearer as we proceed through the section.

Figure 3.44 *TCP segment format*



Source: https://books.google.co.in/books?id=o8CjAgAAQBAJ&printsec=frontcover&dq=forouzan+computer+networks&hl=en&sa=X&ved=0ahUKEwjV95WPruPhAhVFQo8KHWsUBtsQ6AEIKDAA#v=onepage&q=forouzan%20computer%20networks&f=false, page 186

18. ALE provides at least one sequencing field identifying the last packet received by the client that is transmitting a current data packet. For example, the WLAN network products (including WLAN Access Points such as OmniAccess Stellar AP 1251, 1101, 1201H, 1220, etc., and WLAN Controllers such as 4000 series controller) support wireless protocols such as TCP/IP for transmission. Further, TCP/IP uses sequence numbers and acknowledgement numbers for maintaining the sequence of the packets. Initial Sequence Number (ISN) is given to the first byte of the data to reassemble the bytes at the receiver end (wired and/or wireless devices). Acknowledgement number ("sequencing field") is the next byte number that the receiver expects to receive which also provides acknowledgement for receiving the previous bytes/packets.

- ***Source port address.*** This is a 16-bit field that defines the port number of the application program in the host that is sending the segment.
- ***Destination port address.*** This is a 16-bit field that defines the port number of the application program in the host that is receiving the segment.
- ***Sequence number.*** This 32-bit field defines the number assigned to the first byte of data contained in this segment. As we said before, TCP is a stream transport protocol. To ensure connectivity, each byte to be transmitted is numbered. The sequence number tells the destination which byte in this sequence is the first byte in the segment. During connection establishment (discussed later) each party uses a random number generator to create an **initial sequence number** (ISN), which is usually different in each direction.
- ***Acknowledgment number.*** This 32-bit field defines the byte number that the receiver of the segment is expecting to receive from the other party. If the receiver of the segment has successfully received byte number x from the other party, it returns $x + 1$ as the acknowledgment number. Acknowledgment and data can be piggybacked together.
- ***Header length.*** This 4-bit field indicates the number of 4-byte words in the TCP header. The length of the header can be between 20 and 60 bytes. Therefore, the value of this field is always between 5 ($5 \times 4 = 20$) and 15 ($15 \times 4 = 60$).

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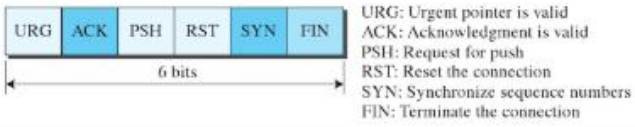
- ***Control.*** This field defines 6 different control bits or flags, as shown in Figure 3.45. One or more of these bits can be set at a time. These bits enable flow control, connection establishment and termination, connection abortion, and the mode of data transfer in TCP. A brief description of each bit is shown in the figure. We will discuss them further when we study the detailed operation of TCP later in the chapter.

Figure 3.45 *Control field*



URG: Urgent pointer is valid
ACK: Acknowledgment is valid
PSH: Request for push
RST: Reset the connection
SYN: Synchronize sequence numbers
FIN: Terminate the connection

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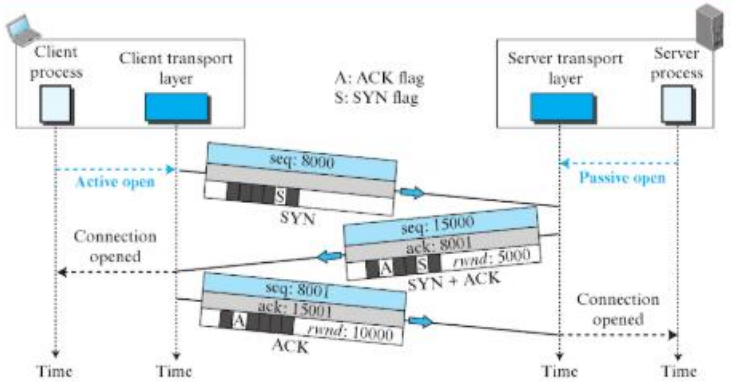
https://books.google.co.in/books?id=o8CjAgAAQBAJ&printsec=frontcover&dq=forouzan+computer+networks&hl=en&sa=X&ved=0ahUKEwjV95WPruPhAhVFQo8KHWsUBtsQ6AEIKDAA#v=onepage&q=forouzan%20computer%20networks&f=false, page 187

Figure 3.47 *Connection establishment using three-way handshaking*



number, the control flags (only those that are set), and window size if relevant. The three steps in this phase are as follows.

1. The client sends the first segment, a SYN segment, in which only the SYN flag is set. This segment is for synchronization of sequence numbers. The client in our example chooses a random number as the first sequence number and sends this number to the server. This sequence number is called the initial sequence number (ISN). Note that this segment does not contain an acknowledgment number. It does not define the window size either; a window size definition makes sense only when a segment includes an acknowledgment. The segment can also include some options that we discuss later in the chapter. Note that the SYN segment is a control segment and carries no data. However, it consumes one sequence number because it needs to be acknowledged. We can say that the SYN segment carries one imaginary byte.

A SYN segment cannot carry data, but it consumes one sequence number.

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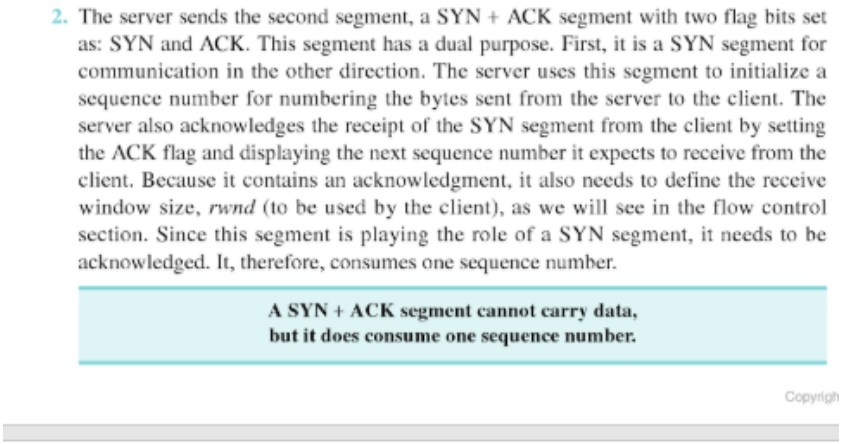

2. The server sends the second segment, a SYN + ACK segment with two flag bits set as: SYN and ACK. This segment has a dual purpose. First, it is a SYN segment for communication in the other direction. The server uses this segment to initialize a sequence number for numbering the bytes sent from the server to the client. The server also acknowledges the receipt of the SYN segment from the client by setting the ACK flag and displaying the next sequence number it expects to receive from the client. Because it contains an acknowledgment, it also needs to define the receive window size, *rwnd* (to be used by the client), as we will see in the flow control section. Since this segment is playing the role of a SYN segment, it needs to be acknowledged. It, therefore, consumes one sequence number.

A SYN + ACK segment cannot carry data, but it does consume one sequence number.

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3 TRANSPORT LAYER

3. The client sends the third segment. This is just an ACK segment. It acknowledges the receipt of the second segment with the ACK flag and acknowledgment number field. Note that the ACK segment does not consume any sequence numbers if it does not carry data, but some implementations allow this third segment in the connection phase to carry the first chunk of data from the client. In this case, the segment consumes as many sequence numbers as the number of data bytes.

An ACK segment, if carrying no data, consumes no sequence number.

Source: https://books.google.co.in/books?id=o8CjAgAAQBAJ&printsec=frontcover&dq=forouzan+computer+networks&hl=en&sa=X&ved=0ahUKEwjV95WPruPhAhVFQo8KHWsUBtsQ6AEIKDAA#v=onepage&q=forouzan%20computer%20networks&f=false, page 190

19. In the alternative, because the manner of use by Defendant differs in no substantial way from language of the claims, if Defendant is not found to literally infringe, Defendant infringes under the doctrine of equivalents.

20. Defendant's aforesaid activities have been without authority and/or license from Plaintiff.

21. In addition to what is required for pleadings in patent cases, and to the extent any marking was required by 35 U.S.C. § 287, Plaintiff and all predecessors in interest to the '095 Patent complied with all marking requirements under 35 U.S.C. § 287.

22. Plaintiff is entitled to recover from Defendant the damages sustained by Plaintiff as a result of the Defendant's wrongful acts in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff respectfully requests that this Court enter:

1. A judgment in favor of Plaintiff that Defendant has infringed the '813 Patent;

2. A judgment and order requiring Defendant to pay Plaintiff its damages, costs, expenses, and prejudgment and post-judgment interest for Defendant's infringement of the '813 Patent as provided under 35 U.S.C. § 284;

3. An award to Plaintiff for enhanced damages resulting from the knowing, deliberate, and willful nature of Defendant's prohibited conduct with notice being made at least as early as the date of the filing of this Complaint, as provided under 35 U.S.C. § 284;

4. A judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to Plaintiff its reasonable attorneys' fees; and

5. Any and all other relief to which Plaintiff may show itself to be entitled.

DEMAND FOR JURY TRIAL

Plaintiff, under Rule 38 of the Federal Rules of Civil Procedure, requests a trial by jury of any issues so triable by right.

Respectfully Submitted,

WIRELESS TRANSPORT LLC

/s/ Jimmy Chong

Dated: July 29, 2019 By: _____

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