

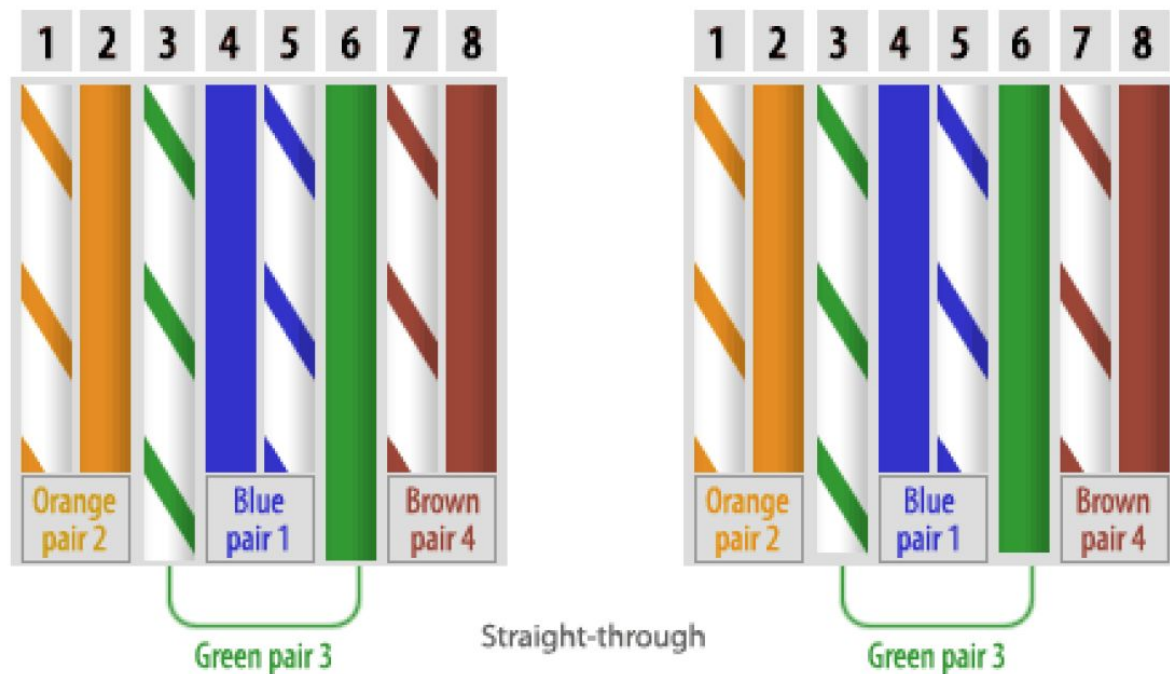
INSTITUTO FEDERAL
Rio Grande do Sul

Redes de Computadores

Análise e Desenvolvimento de Sistemas

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RJ45



RJ45

Color Standard
EIA/TIA T568B

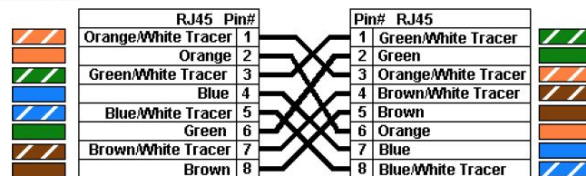
Ethernet Patch Cable

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Color Standard
EIA/TIA T568B

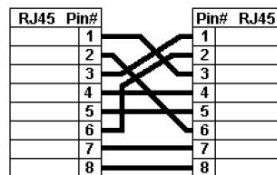
Ethernet Crossover Cable



"B" is most recent

Common Ethernet Crossover Cables may only
cross connect the Orange & Green pairs

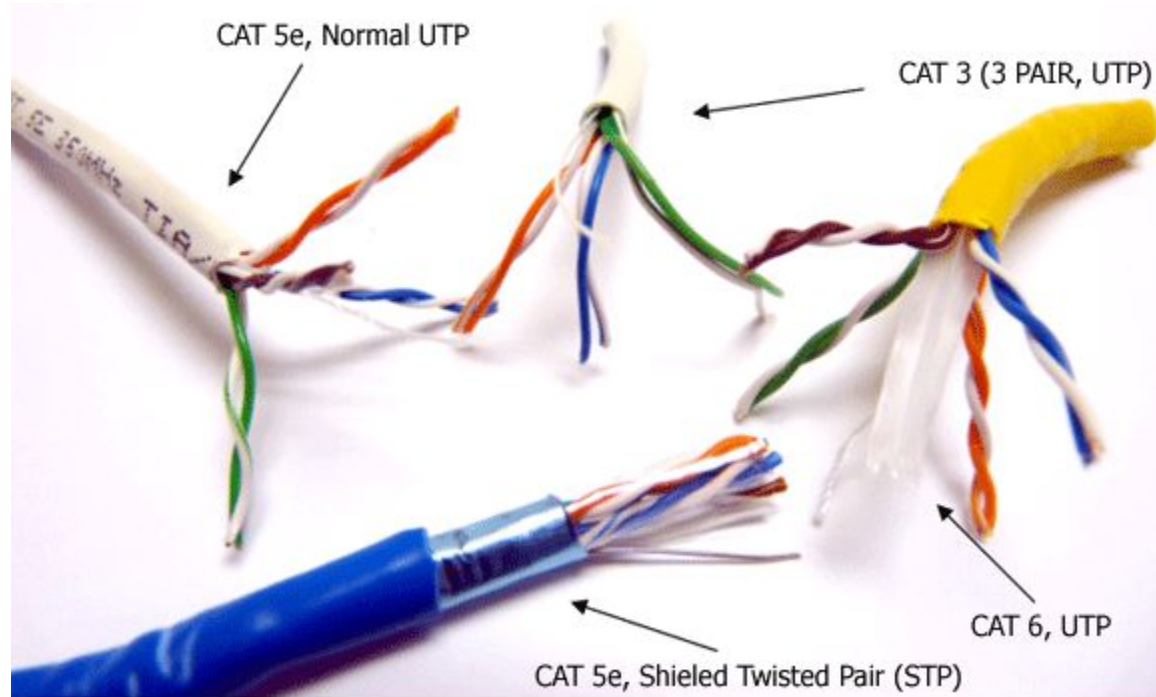
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B&B MODELS:
C5UMB3FOR-CROSS
C5UMB7FOR-CROSS

Pins #4 & #5 and #7 & #8 connect without
crossing for PoE devices using these for
Power Over Ethernet

Cabos Ethernet



Cabos Ethernet

Categoria	Norma	Largura de Banda	Cabo	Utilização
Cat3	TIA ISO/IEC NBR CENELEC	16 MHz	UTP e FUTP	Telefonia Ethernet
Cat4	Não Reconhecido	20 MHz	UTP / STP	Token Ring
Cat5	Não Reconhecido	100 MHz	UTP	Fast-Ethernet
Cat5e	TIA ISO/IEC NBR CENELEC	125 MHz	UTP e FUTP	Fast-Ethernet Gigabit-Ethernet
Cat6	TIA ISO/IEC NBR CENELEC	250 MHz	UTP e FUTP	Gigabit-Ethernet
Cat6A	TIA ISO/IEC	500 MHz	UTP e FUTP	10 Gbps
Cat7	ISO/IEC NBR	600 MHz	S/FTP e F/FTP	40 Gbps
Cat7A	Em Desenvolvimento	1 GHz	S/FTP e F/FTP	100 Gbps
(*) A Classe F (equivalente ao Cat7) não é reconhecida pela ANSI/TIA.				

IEEE 802.11 (WiFi)

TABLE 1: IEEE 802.11 COMMON WIFI STANDARDS BREAKDOWN

Standard	Frequency Band	Bandwidth	Modulation Scheme	Channel Arch.	Maximum Data Rate	Range	Max Transmit Power
802.11	2.4 GHz	20 MHz	BPSK to 256-QAM	DSSS, FHSS	2 Mbps	20 m	100 mW
b	2.4 GHz	21 MHz	BPSK to 256-QAM	CCK, DSSS	11 Mbps	35 m	100 mW
a	5 GHz	22 MHz	BPSK to 256-QAM	OFDM	54 Mbps	35 m	100 mW
g	2.4 GHz	23 MHz	BPSK to 256-QAM	DSSS, OFDM	54 Mbps	70 m	100 mW
n	2.4 GHz, 5 GHz	24 MHz and 40 MHz	BPSK to 256-QAM	OFDM	600 Mbps	70 m	100 mW
ac	5 GHz	20, 40, 80, 80+80=160 MHz	BPSK to 256-QAM	OFDM	6.93 Gbps	35 m	160 mW
ad	60 GHz	2.16 GHz	BPSK to 64-QAM	SC, OFDM	6.76 Gbps	10 m	10 mW
af	54-790 MHz	6, 7, and 8 MHz	BPSK to 256-QAM	SC, OFDM	26.7 Mbps	>1km ?	100 mW
ah	900 MHz	1, 2, 4, 8, and 16 MHz	BPSK to 256-QAM	SC, OFDM	40 Mbps	1 km	100 mW

IEEE 802.11 (WiFi)

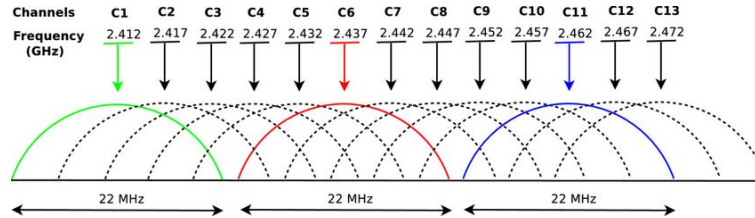
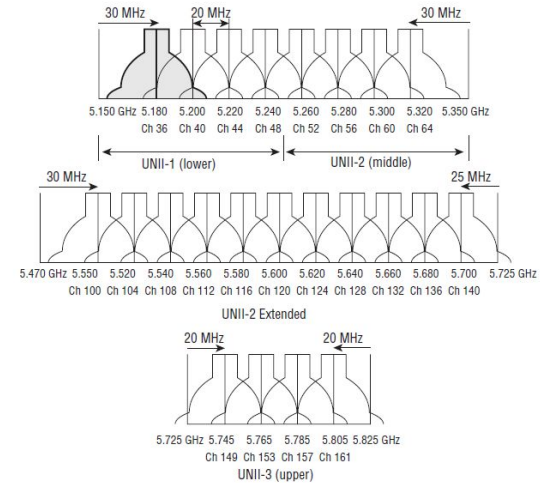


Table 1. Main features of WEP, WPA, and WPA-2

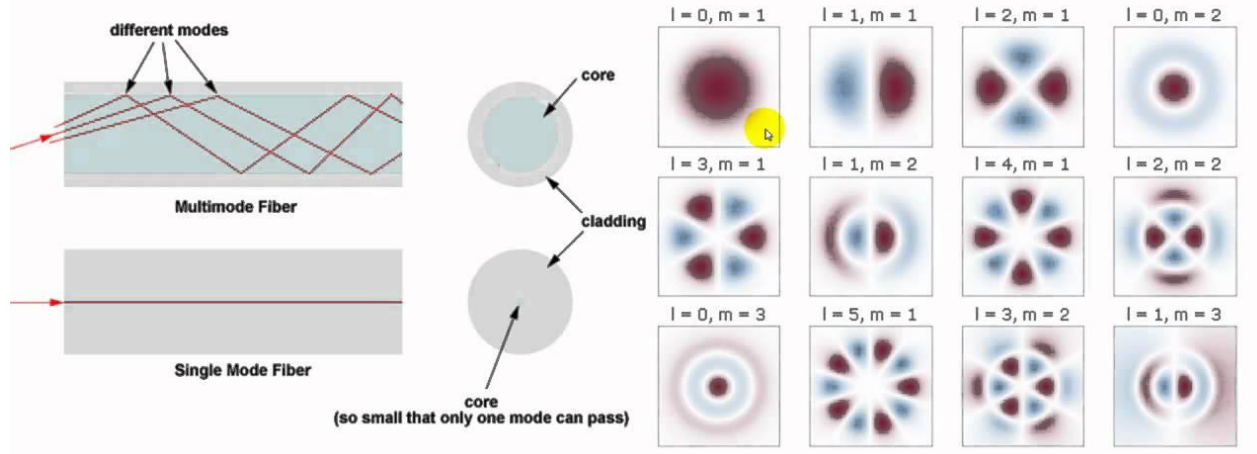
	WEP	WPA	WPA-2
Authentication	N/A	IEEE 802.1X/ EAP/PSK	IEEE 802.1X/ EAP/PSK
Cryptographic algorithm	RC4	RC4	AES
Key size	40 O 104 bits	128 bits	128 bits
Encryption method	WEP	TKIP	CCMP
Data integrity	CRC32	MIC	CCM
Keys for packets	No	Yes	Yes
IV length	24 bits	48 bits	48 bits

FIGURE 2.11 UNII channel overview



Fibras

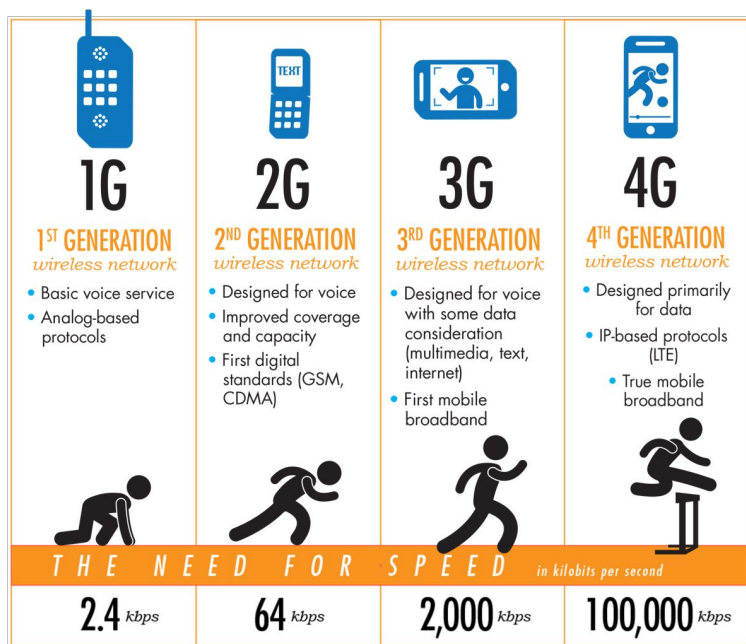
Step-Index Multimode Fiber



Fibras

Fibra Óptica Multimodo 62,5/125µm			
Padrão	Janela (nm)	Distância Máxima (m)	Velocidade
10BASE-FL	850	2.000	10Mbps
100BASE-FX	1300	2.000	100Mbps
1000BASE-SX	850	275	1Gbps
1000BASE-LX	1300	550	1Gbps
10GBASE-SR	850	33	10Gbps
10GBASE-LX4	1300	300	10Gbps
Fibra Óptica Multimodo 50/125µm			
Padrão	Janela (nm)	Distância Máxima (m)	Velocidade
1000BASE-SX	850	1.000	1Gbps
10GBASE-SR	850	300	10Gbps
Fibra Óptica Monomodo 9/125µm			
Padrão	Janela (nm)	Distância Máxima (m)	Velocidade
1000BASE-LX	1300	5.000	1Gbps
10GBASE-LR	1310	10.000	10Gbps
10GBASE-ER	1550	40.000	10Gbps

Telefonia Celular

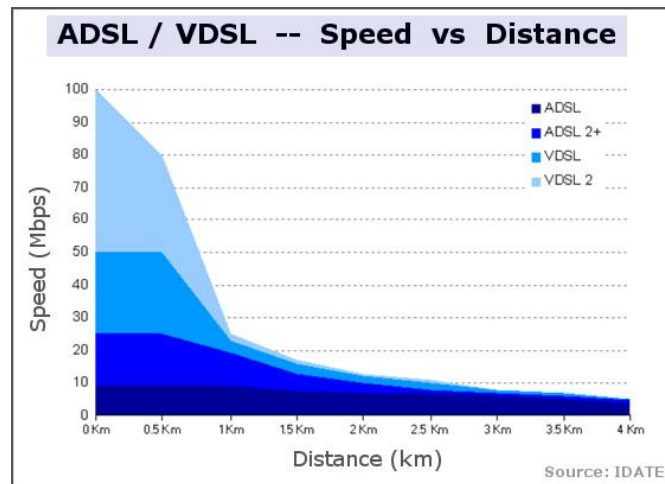


2.5G	GPRS	32-48Kbps	15Kbps	114Kbps	20Kbps	Today
2.75G	EDGE	175Kbps	30Kbps	384Kbps	60Kbps	Today
3G	UMTS	226Kbps	30Kbps	384Kbps	64Kbps	Today
	W-CDMA	800Kbps	60Kbps	2Mbps	153Kbps	Today
	EV-DO Rev. A	1Mbps	500Kbps	3.1Mbps	1.8Mbps	Today
	HSPA 3.6	650Kbps	260Kbps	3.6Mbps	348Kbps	Today
	HSPA 7.2	1.4Mbps	700Kbps	7.2Mbps	2Mbps	Today
Pre-4G	WiMAX	3-6Mbps	1Mbps	100Mbps+	56Mbps	Today
	LTE	5-12Mbps	2-5Mbps	100Mbps+	50Mbps	End 2010
	HSPA+	-	-	56Mbps	22Mbps	2011
	HSPA 14	2Mbps	700Kbps	14Mbps	5.7Mbps	Today*
	WiMAX 2			100Mbps	60Mbps	2010

xDSL

Type of DSL	Downstream Speed (Mbps)								
	0 kft	1 kft	3 kft	5 kft	9 kft	12 kft	18 kft	22 kft	25 kft
ADSL	10	10	8.5	6.5	4.5	2.5	1.5	0	0
ADSL2	12	11	9	7	5	3	1.5	0	0
ADSL2+	25	20	18	16	7	3	0	0	0
VDSL	52	43	25	15	6	3	0	0	0
VDSL2	100	30	18	16	7	3	0	0	0

<http://www.hill2dot0.com/wiki/index.php?title=VDSL2>



Satellite

Service Plans	Connect	Connect Pro	Choice	Prime	Prime Plus	Pro	Pro Plus	Max	Ultra
Satellite	SPACEWAY	SPACEWAY	EchoStar	EchoStar	EchoStar	EchoStar	EchoStar	EchoStar	EchoStar
Download Speeds up to	5 Mbps	5 Mbps	5 Mbps	10 Mbps	10 Mbps	10 Mbps	10 Mbps	15 Mbps	15 Mbps
Upload Speeds up to	1 Mbps	1 Mbps	1 Mbps	1 Mbps	1 Mbps	2 Mbps	2 Mbps	2 Mbps	2 Mbps
Data Allowance					Features SmartBrowsing* Technology		Features SmartBrowsing* Technology	Features SmartBrowsing* Technology	Features SmartBrowsing* Technology
Anytime	5 GB	10 GB	5 GB	10 GB	10 GB	15 GB	15 GB	20 GB	50 GB
Bonus Bytes (2AM-8AM)	+ 5 GB	+ 10 GB	+ 50 GB	+ 50 GB	+ 50 GB	+ 50 GB	+ 50 GB	+ 50 GB	+ 50 GB
Monthly Total	10 GB	20 GB	55 GB	60 GB	60 GB	65 GB	65 GB	70 GB	100 GB
Monthly Service Fee	\$49.00	\$59.00	\$49.00	\$59.00	\$59.00	\$79.00	\$79.00	\$129.00	\$89.00

Feature	HughesNet	Dialup
Download Speeds	Fast – 25 Mbps	Slow - 128 Kbps
Upload Speeds	Fast - 3 Mbps	Slow - 52 Kbps
Connection	Always on - no need to log on	Must turn on then log on
Access	Separate access - you can use your phone and Internet at the same time	You can use either your phone or Internet, not both at the same time
Installation Software	No need to install installation software	Many companies make you install installation software
Multiple Plans	4 different plans	Most providers offer only one plan
Customer Service	Customer service is available 24 hours a day, 7 days a week by phone, email, and chat service	Customer service is available 24 hours a day, 7 days a week by email and chat service, phone service may be limited
Email Accounts	5 email accounts	Varies with each provider