cping: Concurrent ping and traceroute

https://www.prinmath.com/ham/cping.zip

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What does cping do?

- Concurrent ping and traceroute
 - Ping multiple targets with history
 - Traceroute with history
- Real time monitoring of network
 - One sample per second with several minute history
- Features
 - Open source (Runs on Linux, OSX and Windows)
 - curses based so can be run remotely
 - Switch between traceroute and ping to troubleshoot
 - Adjust display for screen side

ping

- Target, address and statistics on
- Colored numbers is ping times

File Edit View Search Terminal Help

willem@mercury: /pm/mercury/ip

Target	Address	70	60	50	40	30	20	10 0	ms h	ор	min	avg	max	lost
Principia	10.11.100.1	.24324422242	2352122281	1323161222	22121223145	411423143	222751221234	12221222222223	30.4	4	17.3	28.8	86.8	0
Backbone														
RattleSnake	10.16.7.1	.23714112222	3422142153	3262431123	13524332352	431242351	324355334364	43524635543542	21.9	7	12.9	34.3	73.8	0
CSU	10.16.0.1	.13734121223	5444243253	3267331354	23537522352	332223245	434215334364	43534534542542	20.6	7	15.1	37.9	73.2	0
BuckhornNC	10.16.2.1	.13733321222	4441242142	2267332153	14533422252	332232242	244614234234	43534434542441	19.1	7	15.1	35.1	71.4	0
BuckHornRM	10.16.8.1	.13733221222	4431242142	2367332143	13453422252	321234242	254624224234	43434434542441	18.4	7	14.2	35.0	70.3	0
HorseThNC	10.16.1.1	.1261322 <mark>9</mark> 122	4331452143	3266332143	13423421252	331134231	244614223234	43124434442431	17.1	6	9.2	32.6	69.1	0
HorseThRM	10.30.40.1	.12633212121	4331662146	5266331243	13432422252	331133232	244614223243	43 <mark>9</mark> 24534442431	16.0	6	8.8	33.7	68.0	0
Firestone	10.30.210.1	.11531212121	4331652142	2256321133	12122424222	331123231	244313213193	43423321441131	14.6	5	10.2	29.6	96.7	0
LeeHill	10.30.10.1	.54646458458	6457856656	56567875 1 8	85656585667	754547755	8657485576 <mark>3</mark> 6	51556575465847	6.8	4	3.9	6.2	32.3	0
Thorodin	10.30.20.1	.46555565565	5666564565	556565646	54565646556	465456466	5556555664 <mark>2</mark> 5	46515666544756	5.7	3	4.0	5.6	29.4	0
Saddleback	10.30.32.1	.32443234234	3233323434	13432343324	43234333435	3223423234	4323232333 <mark>2</mark> 4	33224333233323	2.5	2	1.9	3.3	26.3	0
Squaw	10.30.30.1	.66554564565	4665464865	5465556654	46565546545	4556556554	4456545668 <mark>2</mark> 5	65514665546456	5.6	3	4.0	5.5	27.0	0
Devilshead	10.20.50.1	.54665645675	5754555756	654646454	54656455658	545564544	5565656544 <mark>2</mark> 6	55485554454564	4.4	3	3.9	5.4	26.0	0
Almagre	10.30.120.1	.17981718119	8189691719	889999189	81718961919	916171171	881198981929	19918811169111	9.6	5	6.1	9.4	28.7	0
CheyenneMtn	10.30.70.1	.96811119191	9998119191	171181181	11181191188	817191981	991111191128	11199798198918	8.5	6	6.4	10.0	29.4	0
Fremont	10.0.2.1	.11611911919	1111111919	111881911	11911111891	118181111	1 <mark>811119111</mark> 28	11191119119119	9.3	6	6.4	11.0	28.1	0
K0JSC	10.1.2.1	.12111111111	9111119111	1111 <mark>911111</mark>	11111111111	1111111111	221111114132	11121111111111	14.5	7	8.7	14.4	48.6	0
Cedarwood	10.0.11.1	.89788777787	7788987787	78787888778	87789888787	898888788	188799 <mark>111</mark> 799	77797988777888	81.7	9	72.6	83.4	119.1	0
Pueblo	10.0.3.1	.88778878787	7788988778	37778788888	87889887878	887889877	988789 111 799	77888789778887	76.2	8	71.1	82.7	115.5	0
Methodist	10.0.9.1	.111111111111	9111111111	1111111111	11111111191	111119111	1111111111121	11111119111111	11.1	7	8.6	13.0	28.1	0

traceroute

- Runs continuously
- Numbers show time in ms
 - 3=3ms 3=30ms 3=300ms +=>1000ms X=lost
- History shows consistentcy
- Progression shows where problems are

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2021-02-10 Traceroute) 19:22:45 #553 e to UNC	Period 1s Pir	ng time x1 x10 >	(100 ×1000									
Hop Host		IP	60	50	40	30	20	10 0	ms	min	avg	max	lost
1 router	.schreuder.us	192.168.11.1	000000000000000000000000000000000000000	0000000000	000000000	000000000000	000000000	000000000000000000000000000000000000000	0.3	0.2	0.3	0.4	0
2 router	.saddleback.rmham	10.20.22.1	232432332343433	333333232	423232234	33343232432	432334322	433232433224334	3.8	1.8	2.9	4.1	0
3 router	.thorodin.rmham	10.20.3.1	565465465646554	644546565	564565545	44456546542	565455655	546565546555467	6.9	3.8	5.2	20.2	0
4 router	.leehill.rmham	10.20.2.2	654576556587845	555455474	545856658	5556655665 <mark>2</mark>	578576586	65787665 <mark>3</mark> 846578	7.7	3.9	6.3	29.8	0
5 router	.firestone.rmham	10.20.1.2	113832322622123	1131312 <mark>87</mark>	142131351	11212111212	112233215	3 <mark>8111215512113</mark> 1	12.4	7.2	23.4	65.9	0
6 router	.horsetooth.ncarc	10.20.10.1	543133342621124	213131211	143232464	31322211213	212644225	411312355123231	15.6	11.0	30.0	66.7	0
7 router	.unc.ncarc	10.16.4.1	444XXX344632556	21XXXXX23	465854674	32325238317	22465 <mark>XXX1</mark>	431423656225235	55.2	15.1	44.2	107.6	11

Configuration file

- cping.cfg or /etc/cping.cfg
 Use first found
- Target/name pairs
 - Specify targets by IP or DNS
 - Rest of line is the name
- Group and indent by >
- Comment lines #

66.109.209.18.8.8.8 10.11.100.1>Backbone 10.16.7.1 10.16.0.1 10.16.2.1 10.16.8.1 10.16.1.1 10.30.40.1>North 10.16.3.1 10.16.4.1 10.16.6.1 >East 10.30.81.1 10.30.115.1 10.0.10.1 >West 10.30.60.1 10.30.150.110.30.160.1

SkyBeam Google Principia

RattleSnake CSU BuckhornNC BuckHornRM HorseThNC HorseThRM

Budweiser UNC USC

Eldorado Westcreek Blackforest

Badger Mosquito Upper Dowd

Command line parameters

Usage: cping [-vbanrgxthS] [-N count] [-p us] [-f file] [-o file]

- -b White lettering on black background
- -a Show address in ping table
- -n No hops on ping table
- -r Scroll pings left to right
- -p microseconds between pings [default 1000]
- -f config file [default cping.cfg or /etc/cping.cfg]
- -o output file
- -N Stop after this many pings
- -s seconds between ping
- -S silent
- -x show numeric ping character
- -t show ping time stats
- -v show cping version
- -h help

Keystrokes

- Add more or less information as needed
 - Ping memory is unchanged
- Scrolling works in traceroute mode also
 - Starts new history

ſ	Scroll up
↓	Scroll down
←	Select previous router
\rightarrow	Select next router
Enter	Traceroute to router
Esc	Return to ping screen
i	Invert colors
r	Reverse direction
t	Toggle time statistics
S	Toggle sound
a	Toggle address
n	Toggle hop count
С	Toggle character
h	Help
q	Quit program

Internet Control Message Protocol (ICMP)

- RFC 792 (1981)
- Used for debugging and error messages
- Replies generated from IP stack (OS)
 - Unreachable
 - TTL exceeded
 - Redirect
- Used by ping and traceroute

Anatomy of an ICMP Packet

IP Datagram								
	Bits 0–7 Bits 8–15 Bits 16–23 Bits 24–31							
IP Header (20 bytes)	Version/IHL	Type of service	Length					
	Identif	ication	flags and offset					
	Time To Live (TTL) Protocol Checksum							
	Source IP address							
	Destination IP address							
ICMP Header (8 bytes)	Type of message Code Checksum							
	Header Data							
ICMP Payload (optional)	Payload Data							

- Header data: 16 bit ID, 16 bit sequence number
- Payload: timestamp (returned in reply)

How does it know?

- Uses a single IP socket to send and receive
- Source IP says who replied
- ID identifies ping program
 - traceroute and ping use different IDs
- Sequence helps count
- Payload contains time stamp for when sent
 - Returned in reply (measures round trip time)
- Time to Live (TTL) sets how far it can go
 - Used by traceroute to determine path

Future developments

- TCP pings
 - Half open just tickles TCP stack
 - Can be used to monitor services
- Expand feature
 - Ping multiple devices as a site
 - Ping devices on a link

Download from

https://www.prinmath.com/ham/cping.zip

Download contains source code Linux, OSX and Windows executables and update-cping script

Questions?