Analysis of the December DDoS Attack Against SCO

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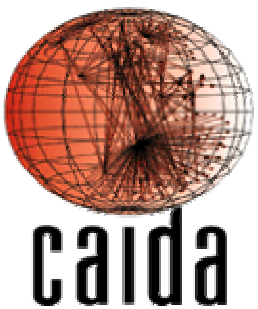
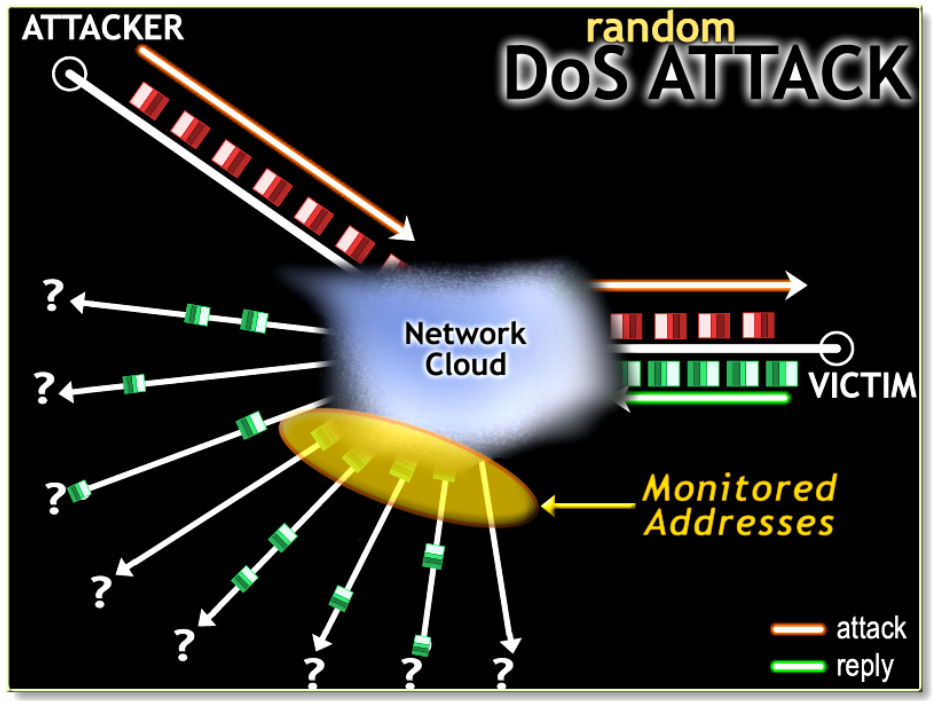


Network Telescope

- Chunk of (globally) routed IP address space
  - 16 million IP addresses
- Little or no legitimate traffic (or easily filtered)
- Unexpected traffic arriving at the network telescope can imply remote network/security events
- Generally good for seeing explosions, not small events
- Depends on random component in spread

Network Telescope: Denial-of-Service Attacks

- Attacker floods the victim with requests using random spoofed source IP addresses
- Victim believes requests are legitimate and responds to each spoofed address
- We observe 1/256th of all *victim responses* to spoofed addresses [MSV01]



SCO Denial-of-Service Attack

- Who is SCO?
  - UNIX (linux) software company
  - Originally Santa Cruz Operations
  - Caldera bought Unix Server Division from Santa Cruz Operations in August of 2000
  - Caldera changed its name to "The SCO Group" in August 2002
  - Sued IBM in March 2003 claiming that IBM misappropriated its UNIX operating system intellectual property (acquired from Novell)
  - Threatened lawsuits against many others

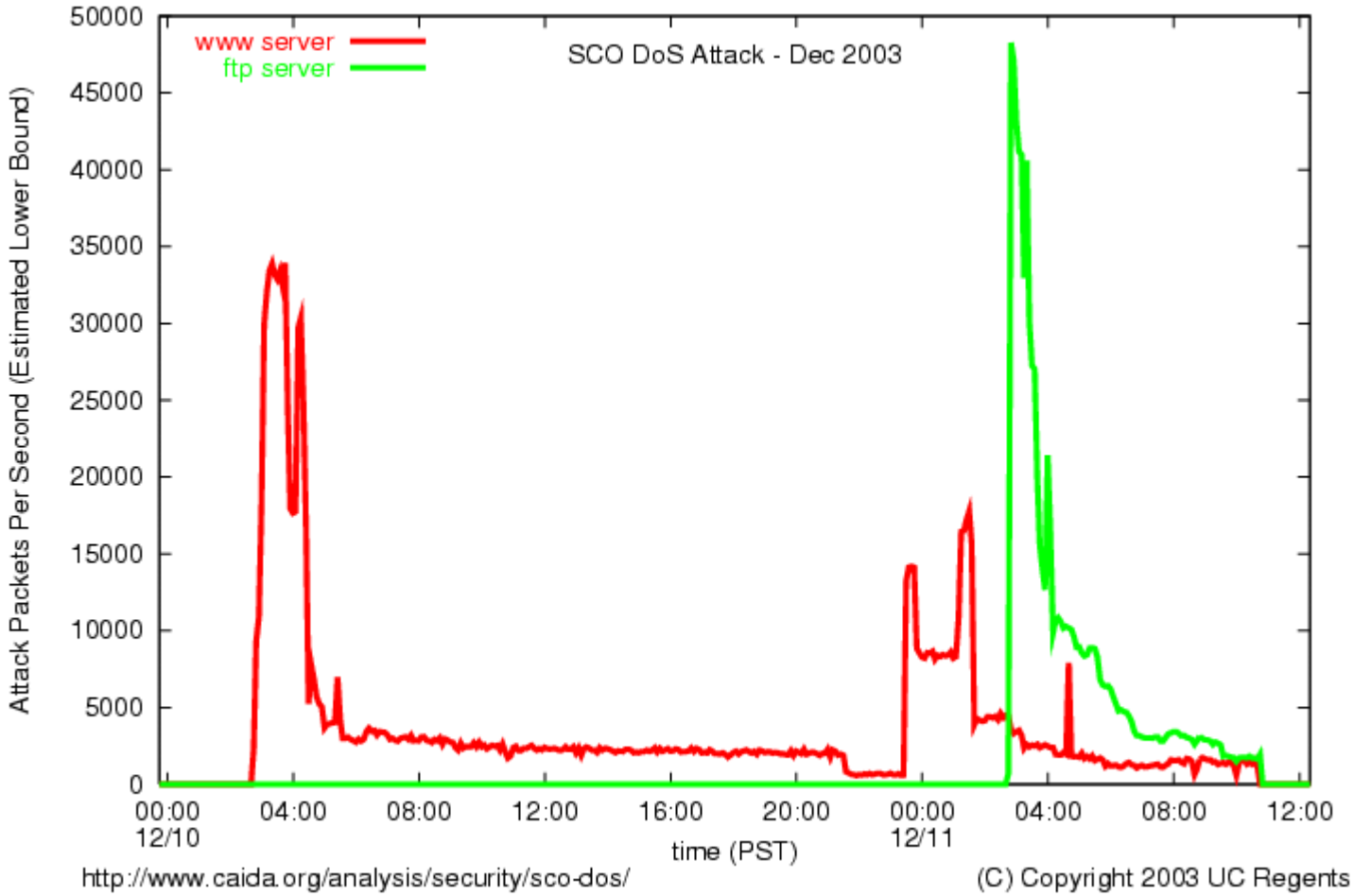
SCO Denial-of-Service Attack History

- May 2003
  - SCO gets hit by its first major DoS Attack
- August 2003
  - SCO gets hit by its second major DoS Attack
  - some rumors that an internal network problem was publicized as a DoS attack

December SCO Denial-of-Service Attack

- December 10, 2003 3:20 AM PST
  - an ~340,000 MB/s SYN flood incapacitates SCO's web server
- December 10, 2003 1:37 PM PST
  - groklaw.net blog "reports" on rumors that SCO is not being attacked; they are faking the whole thing to implicate the open source community
- December 11, 2003 2:50 AM PST
  - the SYN flood is expanded to target SCO's ftp server in addition to their webservers
- December 11, 3003 noon PST
  - SCO takes themselves off the 'net while pursuing upstream filters to block the attack

SCO Denial-of-Service Attack



Now it gets interesting…

- We published http://www.caida.org/analysis/security/sco-dos/
- Rabid open source folks attack CAIDA -- did you know:
  - all of our work is funded by SCO
  - CAIDA isn't actually a research organization at all; it didn't exist before December 10th
  - Bzzt, all wrong!
- CAIDA webserver gets a DoS attack of its own
  - 11pm-1am PST
  - Some attack characteristics point to the same perpetrator (or simply same attack tool) but no conclusive evidence

SCO DoS Attack "Results"

- Security experts (us included) need to be careful what they say in the absence of details
  - Sure, technology exists to thwart SYN floods, but not at 340 Mbit/s inbound coming to a DS3
- It's no fun to be a SCO network admin
  - your own ISP won't admit they give you connectivity, let alone corroborate the attack reports
  - your CEO is quoting the aforementioned security experts who say any 5 year old could stop the attack
  - your only hope is upstream ISPs helping you, but your company is not popular with NOC employees

Points to ponder…

- Why did folks believe SCO was faking the attack?
  - What real motivation do they have to implicate the open source community?
- Is it in the best interest of the open source community to say that SCO faked the attack?
  - Encouraging open source advocates not the cheer the SCO DoS attacks is a good plan
  - Wildly accusing SCO of faking attacks or paying others to attack them is counter-productive

The Real Take-home Message

- Many DoS attacks are short-lived pranks, but the potential for real (fiscal etc.) damage from a well-timed attack is great
- What happened to SCO can happen to your customers – and they will want solutions
- Pertinent questions:
  - Will you have a legal obligation to block traffic for your own customers or customers of other ISPs?
  - What about DoS attacks as blackmail or retaliation? For customers? For small ISPs?
  - Could you offer a pre-emptive blocking service? DoS attack "insurance"?

More Information

- SCO writeup:
  - http://www.caida.org/analysis/security/sco-dos/
- DoS attacks:
  - http://www.caida.org/outreach/Papers/2001/Backscatter/
- Network Telescopes
  - Research potential: http://www.caida.org/analysis/security/telescope/
  - Practical uses and how to build your own:
  - http://www.nanog.org/mtg-0306/sink.html
- CAIDA research
  - http://www.caida.org/