Honeynets

Introduction to Honeypot/Honeynet technologies and Its Historical Perspective

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Introduction and Source of Honeynet Research

- With the introduction to new technologies, new opportunities were introducted to our society but also new related risks.
- The networks are growing and composed of a multitude hosts that could be compromised or used for non-legitimate use.
- A lot of potential attackers is waiting...
- To best defend yourself, it's to understand of the attackers (who? how? maybe why?).

Historical perspective

There were a lack of public information about the attackers of information systems. Attempts and publication were made between 1988 and 1999 like :

- Clifford Stoll - 1989 - The Cuckoo's Egg or the 75 cents issue.
- Bill Cheswick's paper - 1991 - An Evening with Berferd

during 1999, various people were thinking to get together to learn more about attackers. Honeynet research started...

Honeynet evolution

- 1997, DTK (Deception Toolkit)
- 1999, a single sacrificial computer,
- 2000, Generation I Honeynet,
- 2003, Generation II Honeynet,
- 2003, Honeyd software
- 2004, Distributed Honeynets, Malware Collector...

Building tools to learn from the attackers is a never ending circle.

Honeynets/Honeypots - a defintion ?

A (possible) definition : A honeypot is an (information) system resource whose values lies in an unauthorized or illicit usage of that resource.

A more computer-oriented definition :

In computer terminology, a honeypot is a trap set to detect, deflect or in some manner counteract attempts at unauthorized use of information systems. Generally it consists of a computer, data or a network site that appears to be part of a network but which is actually isolated and protected, and which seems to contain information or a resource that would be of value to attackers.

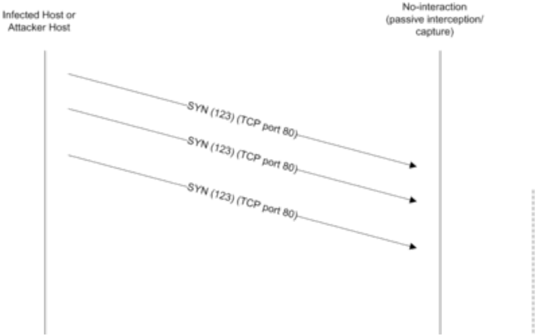
Classification of Honeynets

Honeypots can generally be divided into different categories following the kind of interaction they have with the attackers :

- low-interaction (honeyd, dtk, proxypot, ...)
- medium-interaction (nepenthes, mwcollect, ...)
- high-interaction (complete "vulnerable" operating system virtualized or not)

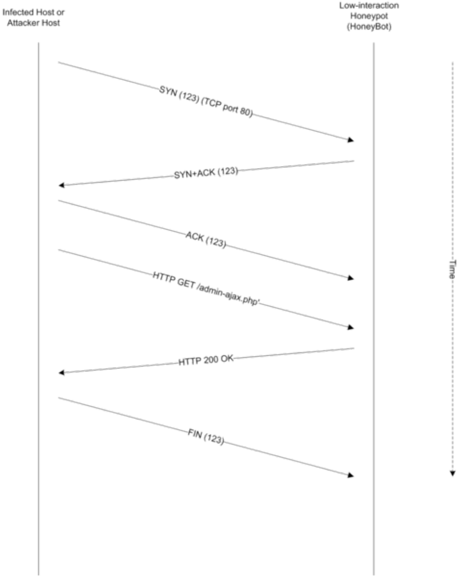
Honeynets can be composed by different kind of honeypots.

Data capture versus Honeypots


Infected Host or Attacker Host
No-interaction (passive interception/ capture)
SYN (123) (TCP port 80)
SYN (123) (TCP port 80)
SYN (123) (TCP port 80)

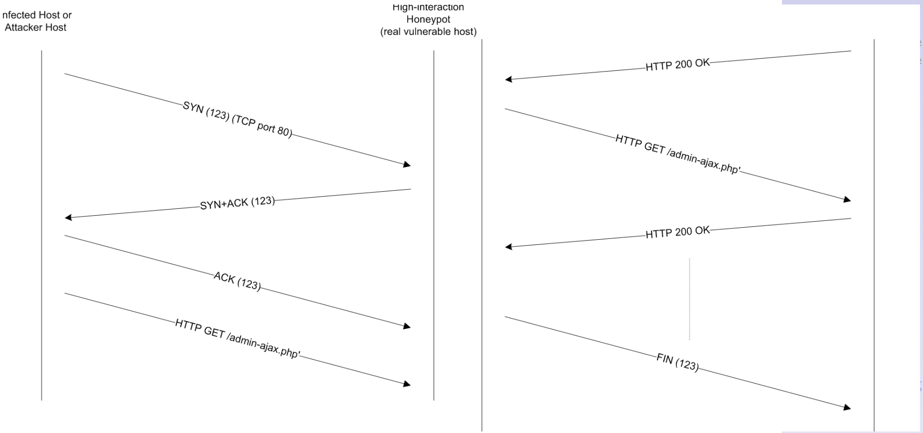
Network data capture is a passive activity and there is no interaction with the potential attacker. The information collected is limited and doesn't help the classification of the potential attacks.

Low-interaction Honeypot



The low-interaction is faking a part of a network services and by so having an interaction with the attacker.

High-interaction Honeypot



The high-interaction honeypot is often working by proposing the real network service.

The known usage of Honeynets

- Spam traps (to not mix with email/spam trap) is to catch Spammer trying to use open services (like HTTP proxy, misconfigured SPAM). From the information collected, you can build table of known spammer or see their approach on how they use Internet ressources.
- Security Research. To learn on how and why they are attacking systems. To see the usage of compromised system. The main purpose is clearly to learn by seeing and improve our skills in computer security. -¿ Raise Awareness by giving out the results and Training.
- Security Mitigation. To use honeynets as a platform to divert attackers from some other systems. To get an early warning platform.

Honeynets/pots - Advantages/Disadvantages

Advantages :

- Honeypots are focused (small data sets)
- Honeypots help to reduce false positive
- Honeypots help to catch unkown attacks (false negative)
- Honeypots can capture encrypted activity (cf. Sebek)
- Honeypots work with IPv6
- Honeypots are very flexible (advantage/disadvantage?)
- Honeypots require minimal resources

Disadvantages :

- Honeypots field of view limited (focused)
- Risk, risk... and risks.

Conclusion

- Risks are part of Honeynet research and we have to manage it
- Honeynets are used to be better prepared to information system attacks
- Honeynets can early detect new threats and issues
- Honeynets are often a research playground to better learn security issues in information systems
- Honeynets are a source of in-depth information that classical information security system can't easily provide
- ... the area is still young and can provide new territories to better secure the information society.

Q and A

- Thanks for listening.
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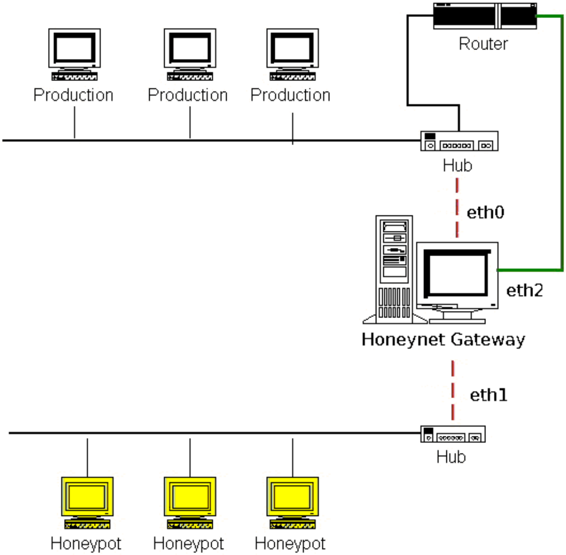
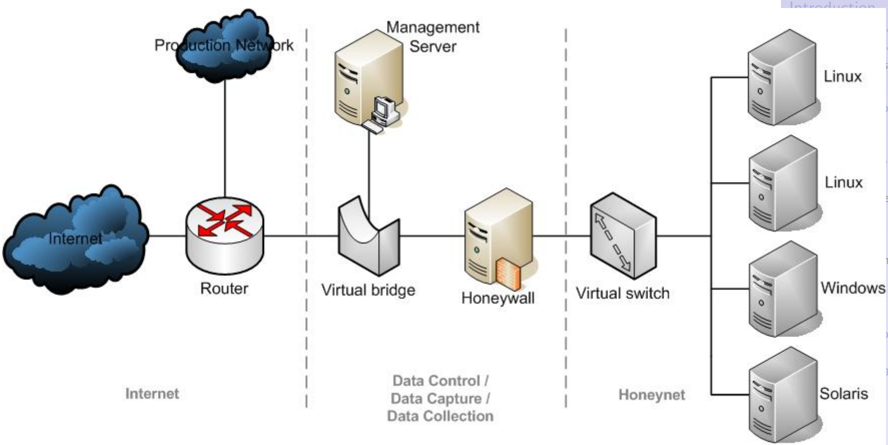
Genl Honeynet + Mitigation

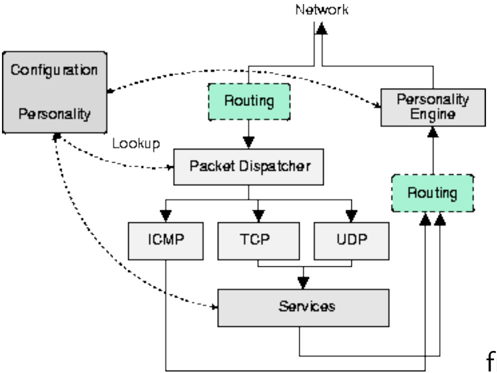


GenII Honeynet



Pakistan Honeynet Project – GenII Honeynet

Honeyd design



from http://www.honeyd.org/