



Partnership for International Research and Education
A Global Living Laboratory for Cyberinfrastructure Application Enablement

Secure Management of Pervasive and Cloud Computing :

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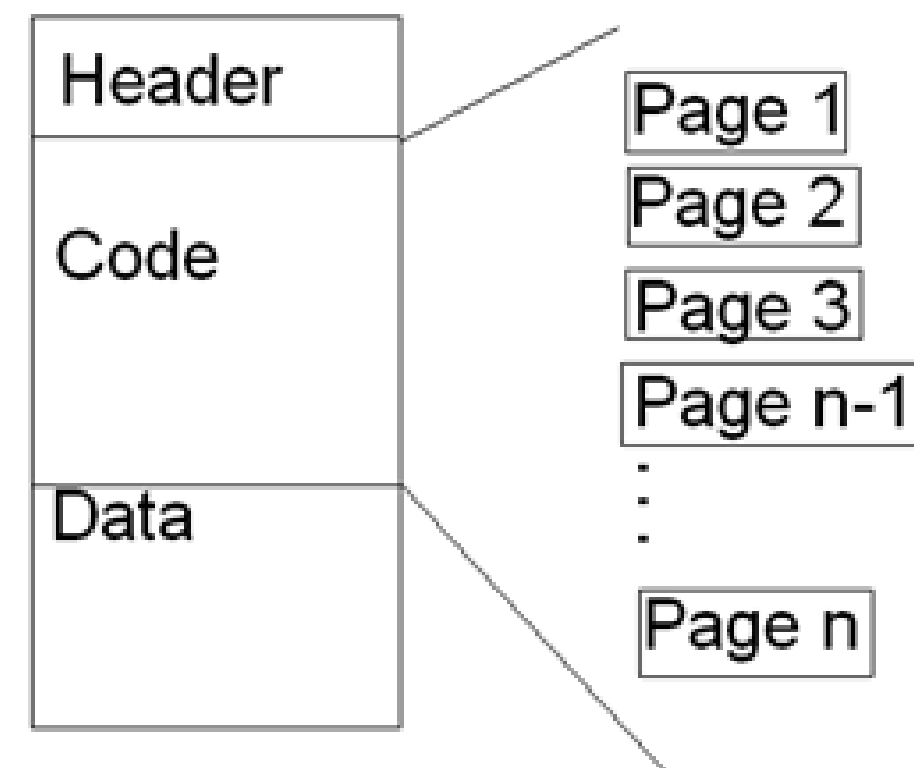
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I. Research Overview and Outcome

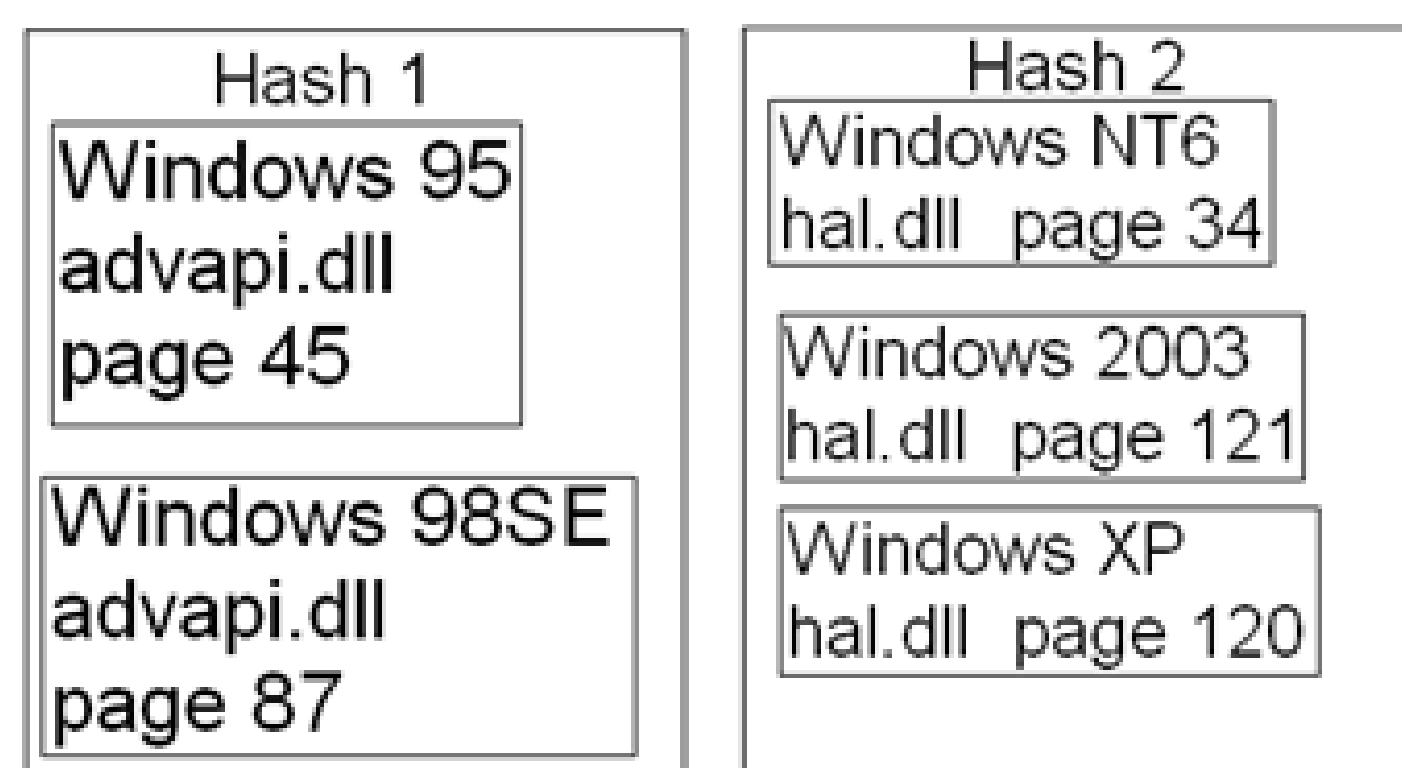
Phase 1: Simulate Memory Pages

- We want to use good candidate memory pages for deduplication.
- We chose to cut out the read-only code portions of executable files from different operating systems and split them into memory pages.



Phase 2: Build a VM simulator

- Next, we built a virtual machine simulator to read in memory pages and build a deduplicated memory page mapping.



Phase 3: Test Performance

- In this phase, we will load memory pages in and out of our simulated memory to calculate the delay in loading cross-platform executables vs. same-platform executables.
- The Shorter the delay, the more similar the executable code. If we know vulnerabilities in one we may know them in the other.

Operation Count	Platform	Executable	Delay
1	Linux 2.6.20	Firefox	500ms
2	Windows XP	Internet Explorer	700ms
3	Linux 2.6.10	Firefox	50ms

Firefox was the same version as count = 1

Motivation & Contribution

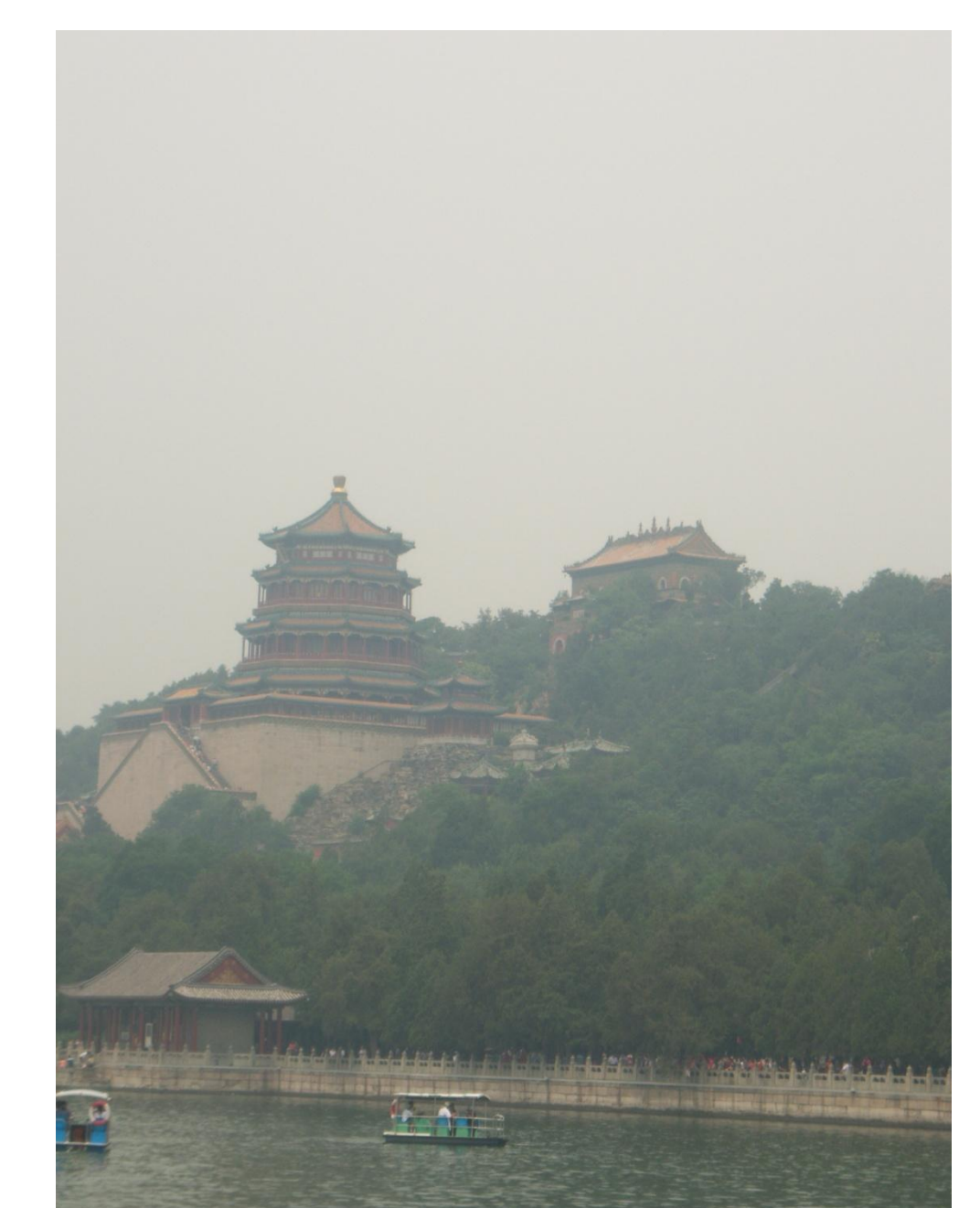
- Google Health & Microsoft HealthVault
- Motivation to gain access to health data:
 - Marketing
 - Blackmail
 - Personal Harm (Ex: peanut butter put into food of individual with peanut allergies)
- With cloud computing, leased virtual machines may run side-by-side with virtual machines that contain private health information.
- Should attackers be able to determine the software versions running on another virtual machine, they will be able to find exploits in that other virtual machine's code without scanning that VM/
- In our research, we explore one possibility to determine what software is running on a target virtual machine when the attacker has control over another virtual machine that is running on the same host.

II. International Experience

Beijing China:

Beijing was a very interesting city to (short term) live in. Fighting US stereotypes was difficult, but easy to ignore by looking at the good parts. The people were very friendly and no one was frustrated with us. It was part of the culture to not confront people, and this was a welcome relief from the typical experience when living in a big city back home.

China has a lot of history (written history dating back to 1700 BC). This is reflected in both their culture and in tourist attractions. Though they are becoming very "modernized," reflections of their cultural heritage is seen everywhere from how people act to how architects design buildings.



III. Acknowledgement

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