

Solutions


Exercises 2nd Semester

Exercise 3.1 (Authentication Bypass)

| # | Username | Password | Created SQL Query | Query Result |
|---|----------|--------------|------------------------------------------------------------------------------------|--------------|
| 1 | horst | n0Rd4kAD3m!E | <pre>SELECT id FROM users WHERE name = 'horst' AND password = 'n0Rd4kAD3m!E'</pre> | 42 |
| 2 | ' | qwertz | <pre>SELECT id FROM users WHERE name = '' AND password = 'qwertz'</pre> | Error |
| 3 | '-- | abc123 | <pre>SELECT id FROM users WHERE name = '-- AND password = 'abc123'</pre> | null |

| # | Username | Password | Created SQL Query | Query Result |
|---|----------------|------------|-------------------------------------------------------------------------|--------------|
| 4 | horst'-- | qwertz | SELECT id FROM users WHERE name = 'horst'- - AND password = 'qwertz' | 42 |
| 5 | admin'-- | <anything> | SELECT id FROM users WHERE name = 'admin' | 1 |
| 6 | ' OR 1=1- - | <anything> | SELECT id FROM users | 1, 2, ... |

Exercise 6.1 (Info. Classification)

| Practice | Public | Internal | Confidential | Secret |
|----------------------------------------------------------------------------------------------|--------|----------|----------------------------|--------------------------------------------|
| Publish on Internet | ✓ | ✗ | ✗ | ✗ |
| Publish on Intranet | ✓ | ✓ | ✗ | ✗ |
| Print on  | ✓ | ✓ | ✓ if picked up immediately | ✓ on personal or otherwise secured printer |

| Practice | Public | Internal | Confidential | Secret |
|--------------------------|--------|------------|--------------------------------|--------------------------------|
| Share with third parties | ✓ | ✓ with NDA | ✓ with NDA + permission | ✓ with NDA + permission |
| Copy to USB key | ✓ | ✓ | ✓ with encryption + permission | ✓ with encryption + permission |

⚠ *Many organizations do not allow the use of USB keys **in general**. This kind of restriction would obviously **overrule** any of the above "Copy to USB" assessments with ✗.*

Exercise 6.2 (Data Lifecycle Phases)

| Phase | Internal | Confidential | Secret |
|-----------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------------------|
| Permanent storage | ● Access Control (against external access) | ● Access Control ○ Access logs, Encryption | ● Access Control, Access logs, Encryption |
| Transfer (internal network) | No restrictions | ○ Encryption (e.g. TLS) | ● Encryption (e.g. TLS) ○/● End-to-end encryption (e.g. PGP, Signal) |

| Phase | Internal | Confidential | Secret |
|---------------------------|-------------------------|-----------------------------------------|---------------------------------------------------------------------------------|
| Transfer (public network) | ○ Encryption (e.g. VPN) | ○ Encryption (e.g. VPN, TLS) | ● Encryption (e.g. VPN, TLS) ○/● End-to-end encryption (e.g. PGP, Signal) |
| Disposal | No restrictions | ● Shredding, secure deletion, data wipe | ● Shredding, secure deletion, data wipe ○/● Destroy medium physically (🔨, 🔥) |


i For "Public" data no restrictions for any lifecycle phases apply.


Exercise 8.2 (ArrayList Deserialization)

```
/**
 * The maximum size of array to allocate.
 * Some VMs reserve some header words in an array.
 * Attempts to allocate larger arrays may result in
 * OutOfMemoryError: Requested array size exceeds VM limit
 */
private static final int MAX_ARRAY_SIZE = Integer.MAX_VALUE - 8;
```

★ Whenever an `OutOfMemoryError` occurs, the affected JVM crashes.

Exercise 8.3 (HashSet Deserialization)

 *With its members recursively linked to each other, when deserializing `root`, the JVM will begin creating a recursive object graph. It will never complete, and consume CPU indefinitely.*

 *If you view this as a PDF, zoom in as much as possible on the above code snippet to get an idea what is going on. You might want to look at [the original Markdown](#) file to actually be able to read something.*

Exercise 9.1 (OWASP Benchmark)

