Security review

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Review of database security

- Risks & vulnerabilities
- General security recommendations
- New reason to patch
- In-house solutions

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Risks

- Data loss / unauthorized change
- Data theft
- Downtime
- Negative press exposure

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Negative publicity

Common vulnerabilities

- **Software vulnerabilities**
  - Both database and applications
  - Most commons flaws widely known
  - Effective and widely available tools
- **Nonexistent or incomplete logging**
  - Difficult attack detection
- **Accounts with no passwords or weak passwords**
  - First and/or only defense line
- ***Nonexistent or incomplete backups***
- Default installs of operating systems
- Large number of open ports
- Not filtering packets

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General recommendations

- Apply CPU patches ASAP
- Limit user privileges
- On installation revoke grants from packages known for security flaws
- Validate applications for vulnerabilities
- Secure DBA credentials
- Work closely with security, sysadmins and network teams
  - Attacker controlling server controls database too

User related recommendations

- Enforce strong passwords and their changes
- Urge users to user owner/reader/writer accounts
- Encourage users to protect applications with strong credentials
- Advise users on exposing sensitive information
  - Passwords and account names
  - Tnsnames
  - Setup information in Wikis/hypernews
- Alert your users to security risks and provide advice

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Patching

- Advertised by Luca in Barcelona
- New reason to patch: Metasploit
  - Framework for using and developing exploits
  - Allows people with no DB skills to gain DBA privileges
  - Tested in August – only latest patches removed all threats
  - New version contains build in support for Oracle exploits
  - New version is being tested now against October patches

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Deployed in-house tools

- Password scanner
  - Script searching for weak passwords on regular bases
- Locking mechanism for owner accounts
  - Very useful in streamed environment
  - Workflow:
    - Owner accounts are locked by default
    - Stored list of account owners
    - Unlock automatic based on an email from owner

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AUDITMON project

- Tool gathering and auditing logon data
- Phase: running prototype
- Can be customized for each experiment
- Uses sets of pre-defined rules to discover abnormalities in user's conduct
- Makes information available to DBA's trough a monitoring page
- Acknowledgments: Luca, David, Raul

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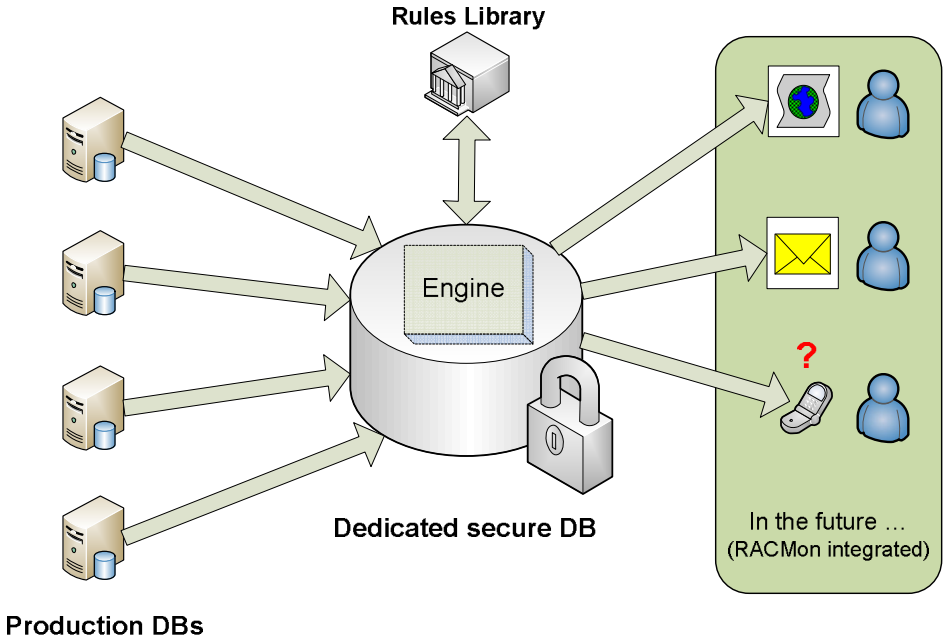
AUDITMON architecture

- Data copied from each database's DBA_AUDIT_SESSION over a db_link
- Incremental copy of data done every hour
- After all data is transferred a set of jobs runs on the repository to check rules
- Per-database results are stored in the result table



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AUDITMON UI

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Home

Operations
Events
Severity

Databases
TEST2
int9r
int2r
int6r

Select info from To Search
Today - Last 24h - Last Week
Selected dates: From '16-Nov-2009 00:11:00' To '25-Nov-2009 9:11:34'

int9r

DATABASE	EVENT	OCCURRENCES
int9r	No of Failed Logons Per Account	143
int9r	No of Failed Logons Per Account	0
int9r	No of Failed Logons Per Database	143
int9r	No of Failed Logons Per Database No restrictions	143

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Select info from To Search
Today - Last 24h - Last Week
Selected dates: From '16-Nov-2009 00:11:00' To '25-Nov-2009 9:11:40'

Severity

SEVERITY	OCCURRENCES
INFO	0
WARNING	1716
ALERT	286

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AUDITMON future

- Broadening the set of rules
- Gathering additional data
  - User related information
- Integrating with DBA alert system
- Using gathered data as base for data-mining analysis
  - Goal: discover less obvious data correlation
  - Adjusting security policies according to discoveries
    - For example changes in profiles

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Conclusions

- Risks are known
- Vulnerabilities are multiplying
- Securing infrastructure is always work in progress
- In-house solutions provide measures tailored to our needs

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