aursec - A blockchain approach to securing software packages

Lukas Krismer & Bennett Piater

October 25, 2016

Universität Innsbruck - QE - Christian Sillaber

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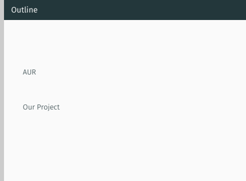
Outline

AUR

Our Project



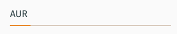
Outline

AUR

Our Project

1 min L

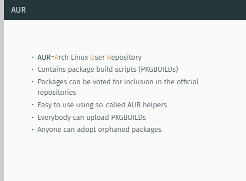
AUR



AUR

AUR

- AUR=Arch Linux User Repository
- Contains package build scripts (PKGBUILDs)
- Packages can be voted for inclusion in the official repositories
- Easy to use using so-called AUR helpers
- Everybody can upload PKGBUILDs
- Anyone can adopt orphaned packages



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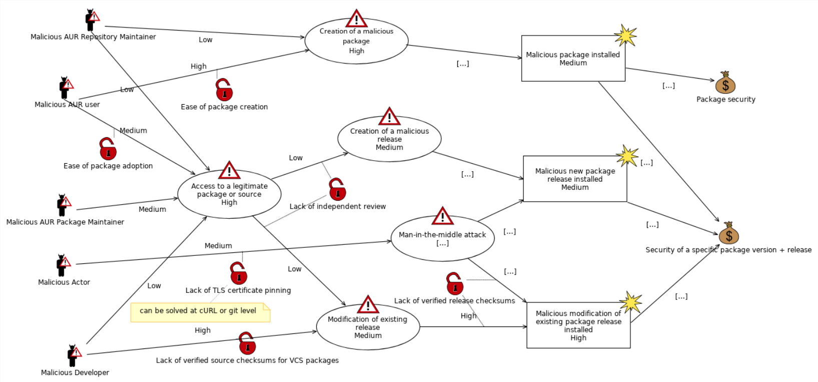
└─AUR

2min L

Threat Assessment


Malicious AUR Repository Maintainer
Low
Creation of a malicious package
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Malicious package installed
Medium
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Package security
High
Low
Malicious AUR user
Ease of package creation
Medium
Ease of package adoption
Creation of a malicious release
Medium
Low
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Malicious new package release installed
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Access to a legitimate package or source
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Lack of independent review
Malicious AUR Package Maintainer
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[...]
Man-in-the-middle attack
[...]
[...]
Security of a specific package version + release
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Malicious Actor
Low
Lack of TLS certificate pinning
Low
[...]
Lack of verified release checksums
can be solved at cURL or git level
High
Modification of existing release
Medium
Malicious modification of existing package release installed
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Malicious Developer
Lack of verified source checksums for VCS packages

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└AUR

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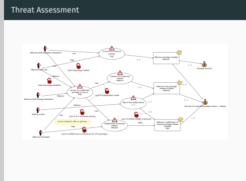


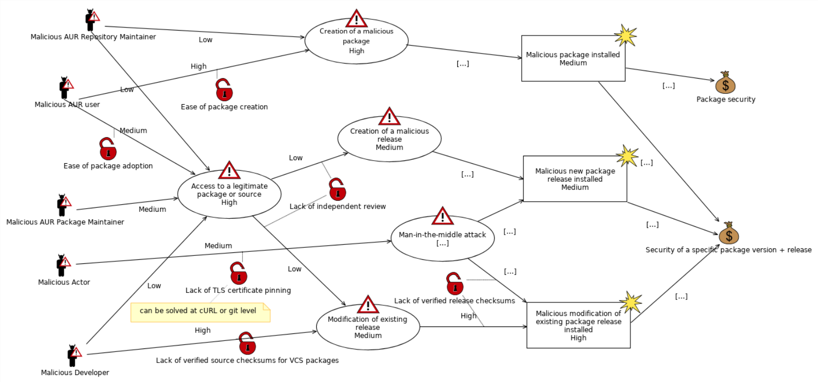
Threat Assessment

2 min B

Our Project

Our Project

Covered Threats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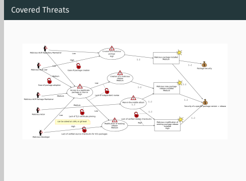
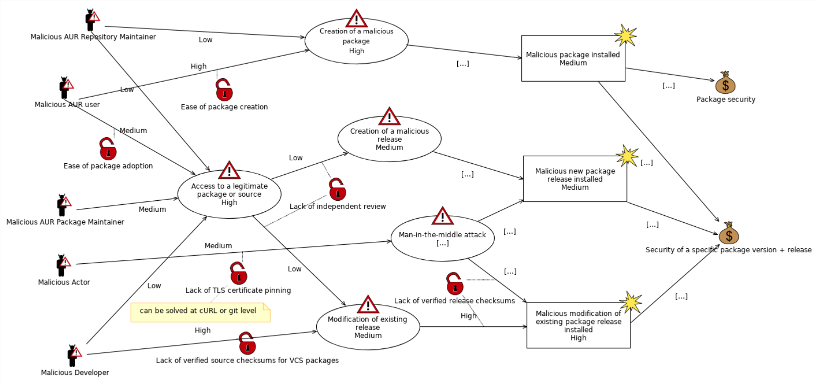


1 min L

Covered Threats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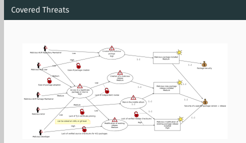
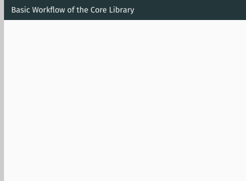
└Our Project

└Covered Threats



1 min L

Basic Workflow of the Core Library



Basic Workflow of the Core Library

3 min L

Components

- Program on a private Ethereum blockchain
- Library and program using it
- AUR package
- Integration in aurutils
- Web- and/or CLI-Interface for stats

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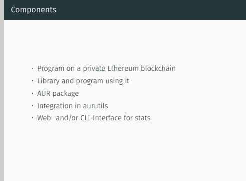
└─Components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2 min B

Schedule

25.10 *prototype:* hashing	B
08.11 Initial Presentation	L
15.11 *prototype:* library without blockchain back-end	B/L
15.11 Bash-API for the blockchain	L
30.11 *finish:* Solidity program	B
08.12 deploy local blockchain for development	L
08.12 running server with ethereum-node	B/L
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20.12 *contrib:* rudimentary pre-build-hooks in aurutils	B

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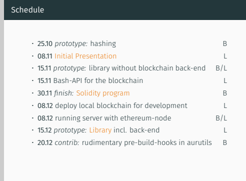

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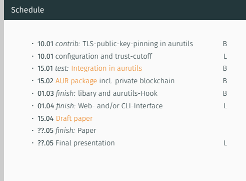
Schedule

- 10.01 *contrib:* TLS-public-key-pinning in aurutils B
- 10.01 configuration and trust-cutoff L
- 15.01 *test:* Integration in aurutils B
- 15.02 AUR package incl. private blockchain B
- 01.03 *finish:* libary and aurutils-Hook B
- 01.04 *finish:* Web- and/or CLI-Interface L
- 15.04 Draft paper
- ??.05 *finish:* Paper
- ??.05 Final presentation L



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