Andreas Wiegenstein

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we harden your software

SAP GUI Hacking (V1.0)

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Who am I

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Andreas Wiegenstein

- CTO and founder of Virtual Forge, responsible for R&D
- SAP Security Researcher, active since 2003
- Speaker at SAP TechEd 2004, 2005, 2006, DSAG 2009, BlackHat 2011
- Co-Author of "Secure ABAP Programming" (SAP Press)

Virtual Forge GmbH

- SAP security product company based in Heidelberg, Germany
- Focus on (ABAP) application security services
  - ABAP Security Scanner
  - ABAP Security Guidelines
  - ABAP Security Trainings
  - SAP Security Consulting

Belief: "Our SAP system is secure."

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- Roles & Authorizations
- Segregation of Duties
- Secure Configuration & System / Service Hardening
- Encryption
- Secure Network Infrastructure
- Password Policies
- Patch Management
- Identity Management
- Single Sign-on

Reality-Check

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"...and this is our ABAP security department."

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1. ABAP, the SAP GUI and everything

- Proprietary language, exact specification not (freely) available
- Platform-independent code
- Client separation built-in
- Integrated auditing capabilities
- System-to-System calls via SAP Remote Function Call (RFC)
- Client-Server communication via SAP GUI (DIAG protocol)
- Various programming paradigms:
  - Programs & Forms, Reports, Function Modules, Dynpros
  - Classes & Methods, Business Server Pages, Web Dynpro ABAP
- Integrated platform-independent SQL Standard: Open SQL
- Built-in authentication, roles and (explicit) authorization model
- Thousands of well-known standard programs and database tables
- 150+ Million Lines of Code in an ECC6.0 System

SAP GUI

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- Proprietary fat client, provided and maintained by SAP
- Available as Windows executable and Java application
- Client-Server Communication via DIAG protocol
- DIAG can be encrypted with SNC, but is only compressed by default
- Renders ABAP Dynpros and is the default SAP user interface
- Provides methods to interchange files with the SAP application server
- Execution of screen-events can be scripted

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2. SAP GUI Attacks originating from the Server

ABAP Functions that access the SAP GUI client

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- Function Module `WS_EXECUTE`
  - Executes an operating system command on the client
- Function Module `GUI_UPLOAD`
  - Uploads a file from the Client to the Server
- Function Module `GUI_DOWNLOAD`
  - Downloads a file from the Server to the Client
- Class `CL_GUI_FRONTEND_SERVICES`
  - Provides various other functions
    - Directory listing, access to clipboard, etc
- Underlying ABAP Commands
  - `CALL METHOD OF`
  - `CALL` *`cfunc`*

DEMO

Mitigation(s)

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- Install SAP GUI 7.20
  - Restrict access to client-side ressources
- New security center in SAP GUI for Windows 7.20

  (https://service.sap.com/sap/support/notes/1483525)

- More on SAP GUI Security
  - "Secure Configuration SAP Netweaver Application Server ABAP"
  - https://service.sap.com/~sapidb/011000358700000968282010E.pdf

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3. SAP GUI Attacks originating from the Client

Client-side Manipulations

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- Forceful Browsing in SAP GUI !
  - Manipulate disabled fields and buttons
- Cross-Site Scripting in SAP GUI applications !!!
  - Not nice, but rare
- SAP GUI scripting
  - Scripting of SAP GUI events

DEMO

Mitigation(s)

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- Do not transport important data by client-roundtrips
- Make sure you use HTMLViewer Control (`CL_DD_DOCUMENT`) securely
- Disable SAP GUI scripting
  - See "SAP GUI Scripting Security Guide"
  - http://www.sdn.sap.com/irj/scn/index?rid=/library/uuid/3099a575-9cf4-2a10-9492-9838706b9262

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4. SAP GUI Attacks originating from the Internet

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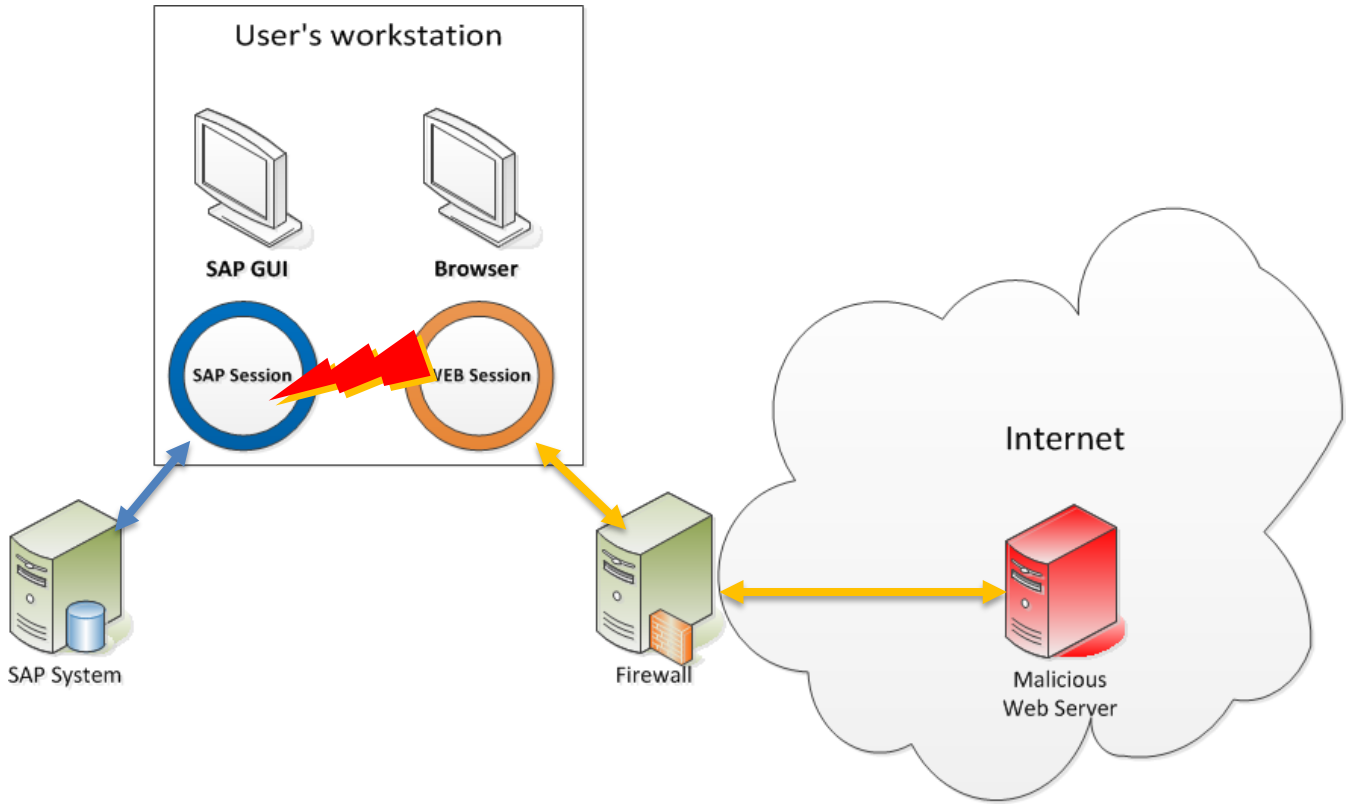
- Cross-Application Request Forgery with SAP Shortcuts
  - Allows malicious Web sites to fire SAP GUI events



DEMO

Mitigation(s)

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- Read SAP Security Notes 1397000 & 1526048
  - (https://service.sap.com/sap/support/notes/1397000)
  - (https://service.sap.com/sap/support/notes/1526048)

SAP / ABAP Security Information

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Organizations

BIZEC
BUSINESS SECURITY

BIZEC – Business Security Initiative
http://www.bizec.org

Literature

"Secure ABAP-Programming"
(German only)
SAP Press 2009

If you find new zero days

secure@sap.com

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Questions?

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