Lotus Domino Security

White and black box testing

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Outline

- Why is This Necessary?
- Introduction to Domino
- Domino Commands
- Blackbox
- Whitebox
- Default Files
- Architecture

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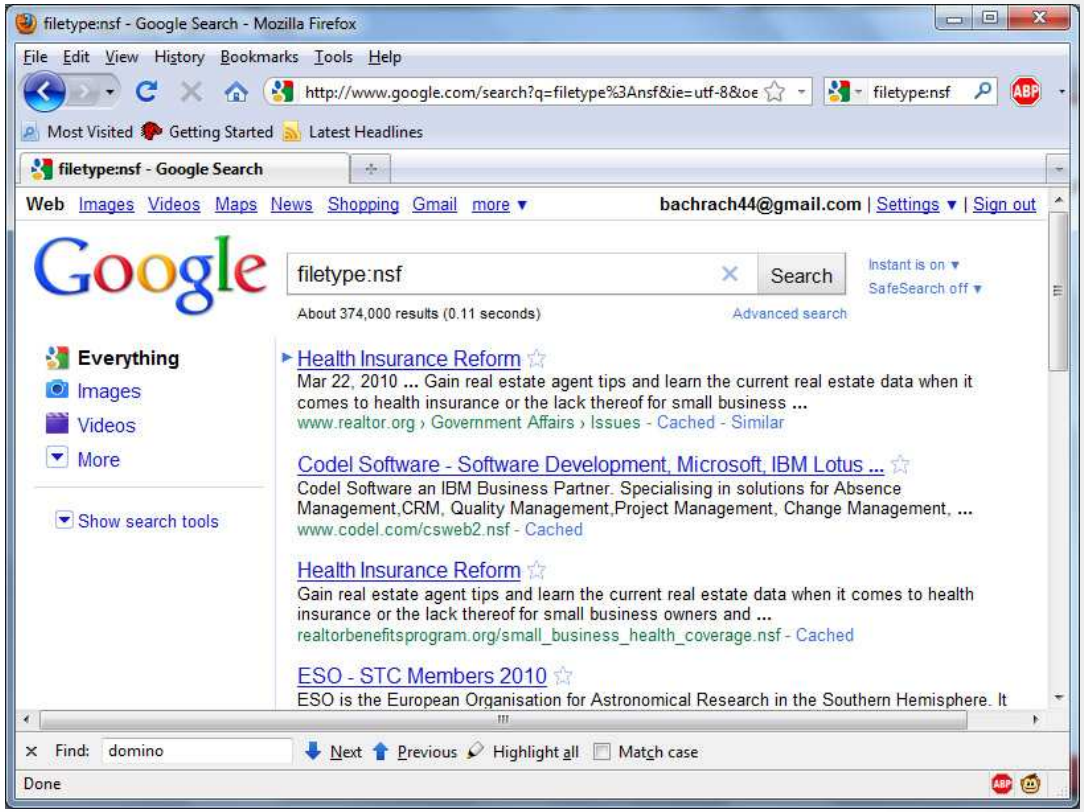
Why is This Necessary?

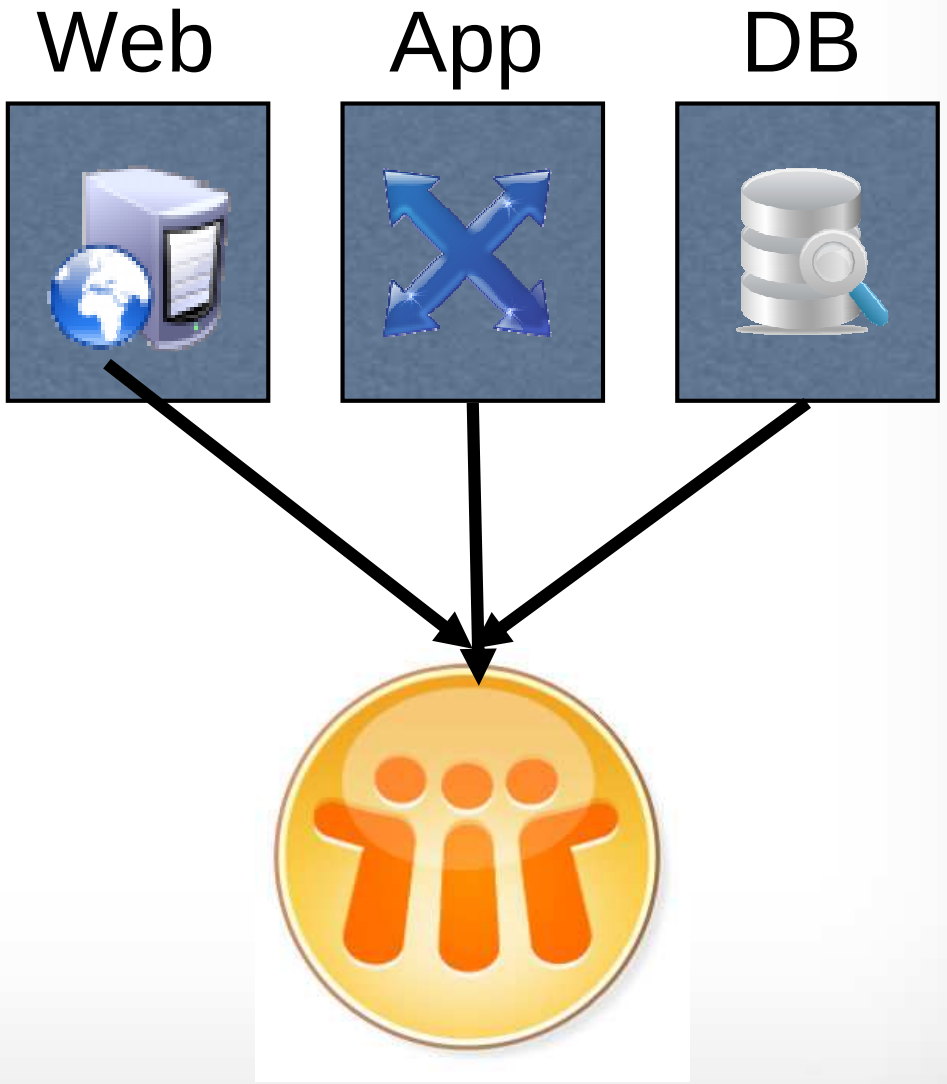
In January 2009, More Than Half of Fortune Global 100 Now Using Lotus Notes/Domino*



http://www-03.ibm.com/press/us/en/pressrelease/26480.wss

Why is This Necessary?

- Domino is…..
  Unique



Why is This Necessary?

- Automated scanners seem to have a hard time with Domino apps
- Many “normal” attacks don’t work (SQL injection)
- There are many other attacks which will work
- Not a lot of good information out there

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Introduction to Domino

- Domino stores data in custom database files with the .nsf extension

http://server/database.nsf/DominoObj?Action

- View
- Frameset
- Form
- Navigator
- Agent
- Document
- Page

Introduction to Domino

- Special Identifiers begin with $ and can return any domino object

http://server/database.nsf/$SpecialIdentifier

http://server/database.nsf/$help?openhelp

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Domino Commands

- **View**
  - Openview – opens the view
  - ReadViewEntries – access the view data in XML format
  - $first – returns the first document in the view
  - $searchform?opensearchform – opens a search form from which the view can be searched

http://server/database.nsf/myview?Openview

Domino Commands

Form

- OpenForm – opens the form
- ReadForm – displays the form without its editable fields.
- CreateDocument – sent using an HTTP post. Domino will create a document with the contents of the HTTP post packet.

http://server/database.nsf/myform?OpenForm

Domino Commands

Document

- EditDcoument
- SaveDocument – sent as an HTTP post. Domino will update the document with the contents of the post.
- DeleteDocument
- OpenDocument
- $file/name – returns doc's attachment with the name "name"

http://server/db.nsf/myView/doc1?EditDocument

Domino Commands

Navigator

- OpenNavigator

Agent

- OpenAgent

Page

- OpenPage

Frameset

Openframeset

http://server/db.nsf/myAgent?OpenAgent

Domino Commands

- **Special Items**
- ?Redirect – allows redirection to another database based on it's ID.
- ?openDatabse
- /$about?OpenAbout – opens the "about this database" document
- /$help?openhelp – opens the help document
- /$icon?openicon – opens the icon for the database
- /$defaultview – returns the default view (if there is one).
- /$defaultform – returns the default form (if there is one).
- /$defaultnav – returns the default navigator
- ?openpreferences – opens the preferences setting.

http://server/database.nsf/$about?OpenAbout

Domino Commands

- **Chaining**

http://host/db.nsf/$defaultview/$first?editdocument

Pause for Questions

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Blackbox

- Navigate the app - use the commands just discussed
- Check all defaults/special identifiers
- Try to edit docs (permissions checking)
- Find (and use) search forms
- Enumerate views (more on this later)

Blackbox

- Views, Forms, and Agents all have a notesID. Assignment begins with 0x11A and increments by 4 each time
- http://host/database.nsf/11A
- http://host/database.nsf/11E
- http://host/database.nsf/122
- http://host/database.nsf/126
- http://host/database.nsf/12A

Blackbox

Enumerate views

Occurrences of view names in help files:

135 - By Category
36 - View A
31 - All
26 - Main
23 - Categorized
22 - Main View
13 - All Documents
6 - Topics

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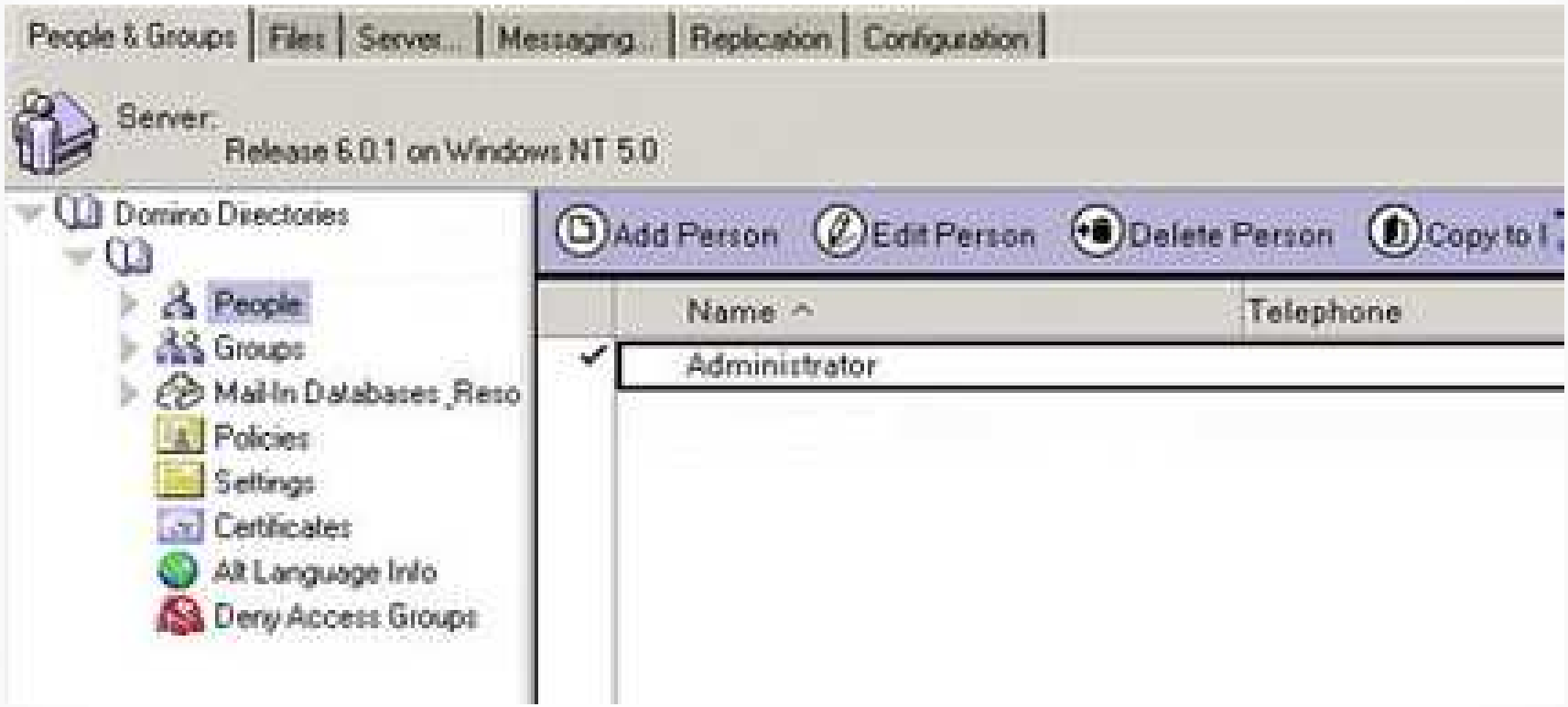
Whitebox

- Levels of Access in Domino
  - Server
  - Database
  - Elements
  - Documents
  - Fields

Whitebox

- Server access – Ask your administrator
  - Server Doc
  - Internet Site Doc
  - Configuration Doc
  - Person Docs – Internet passwords are secure

Whitebox


People & Groups
Files
Server...
Messaging...
Replication
Configuration
Server:
Release 6.0.1 on Windows NT 5.0
Domino Directories
People
Groups
Mail-In Databases Reso
Policies
Settings
Certificates
Alt Language Info
Deny Access Groups
Add Person
Edit Person
Delete Person
Copy to I
Name
Telephone
Administrator

Whitebox

- Database access – ACLs for Web Access
  - Editor – Create and edit docs
  - Author – Create and edit own docs
  - Reader – Read docs
  - Depositor – Create docs
  - No access – Be careful public documents

Whitebox

ACL Mistakes

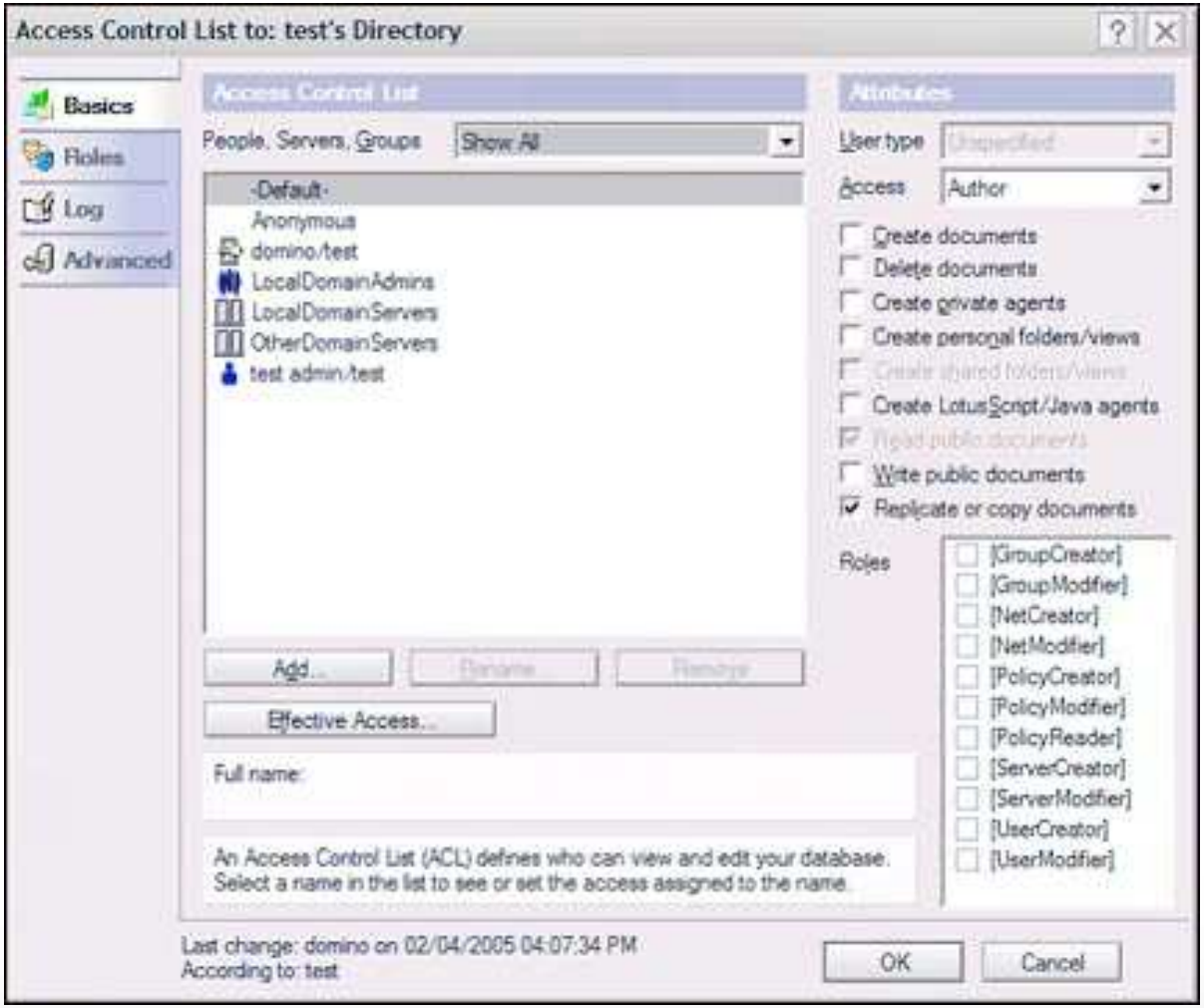
- Even though Anonymous is set to No Access, it is possible to overlook Read Public documents which will give access.
- Common App – Mail File*
- Do not overlook any setting

Whitebox

ACL Mistakes

- -Default- is any user who has authenticated. If allowed access, make sure to audit the Domino Directory for test accounts or LDAP if directory assistance is used.

Whitebox

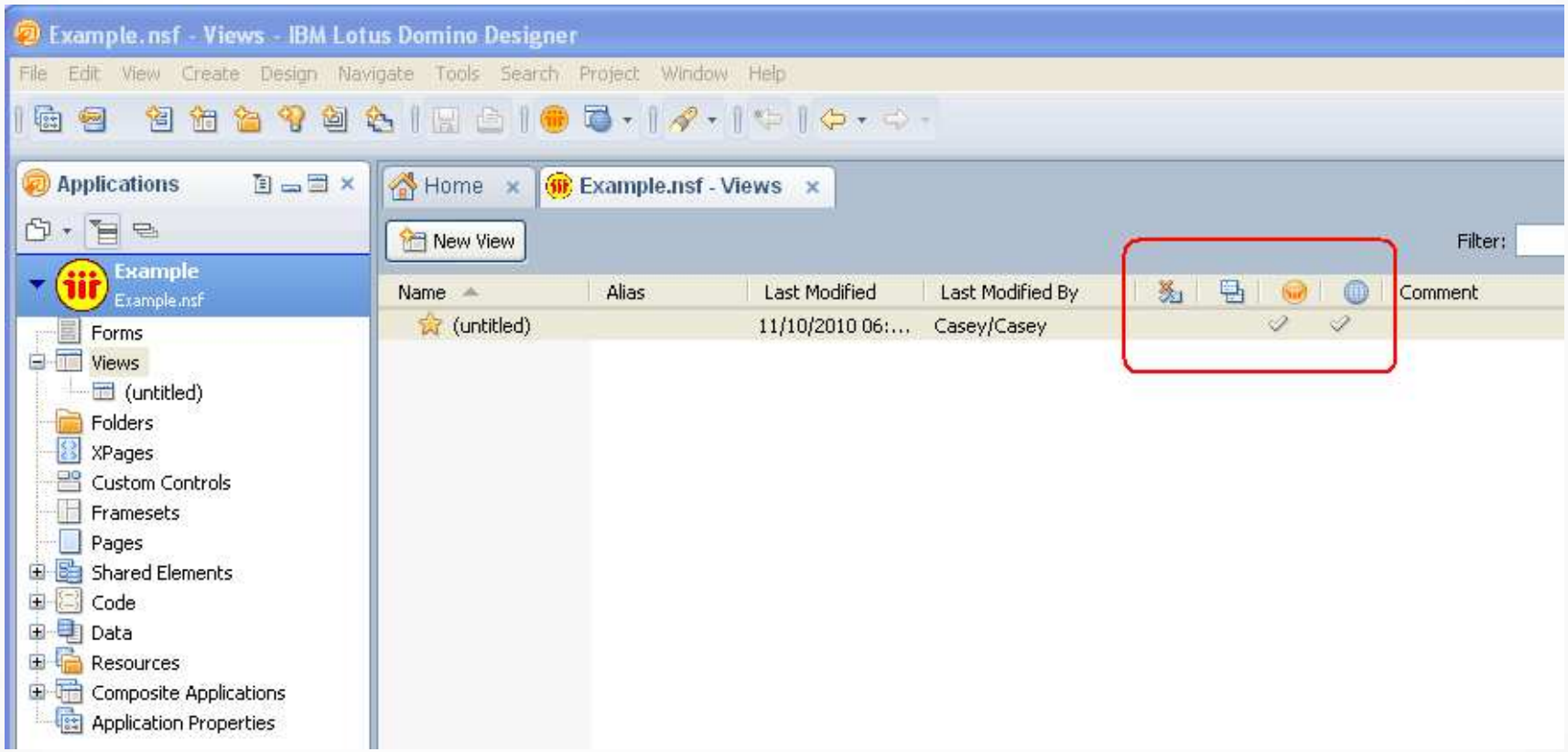

Access Control List to: test's Directory
Basics
Roles
Log
Advanced
Access Control List
People, Servers, Groups
Show All
-Default-
Anonymous
domino/test
LocalDomainAdmins
LocalDomainServers
OtherDomainServers
test admin/test
Add...
Rename
Remove
Effective Access...
Full name:
An Access Control List (ACL) defines who can view and edit your database.
Select a name in the list to see or set the access assigned to the name.
Attributes
User type
Access
Author
Create documents
Delete documents
Create private agents
Create personal folders/views
Create shared folders/views
Create LotusScript/Java agents
Read public documents
Write public documents
Replicate or copy documents
Roles
[GroupCreator]
[GroupModifier]
[NetCreator]
[NetModifier]
[PolicyCreator]
[PolicyModifier]
[PolicyReader]
[ServerCreator]
[ServerModifier]
[UserCreator]
[UserModifier]
Last change: domino on 02/04/2005 04:07:34 PM
According to: test
OK
Cancel

Whitebox

Elements access – Check them ALL

- Forms, Views, Navigators, etc. - If they are not used, hide them from the web.
- Security Tab – Set who can access the element based on ACL
- Allow public access

Whitebox


Example.nsf - Views - IBM Lotus Domino Designer
File Edit View Create Design Navigate Tools Search Project Window Help
Applications
Example
Example.nsf
Forms
Views
(untitled)
Folders
XPages
Custom Controls
Framesets
Pages
Shared Elements
Code
Data
Resources
Composite Applications
Application Properties
Home
Example.nsf - Views
New View
Filter:
Name
Alias
Last Modified
Last Modified By
Comment
(untitled)
11/10/2010 06:...
Casey/Casey

Whitebox

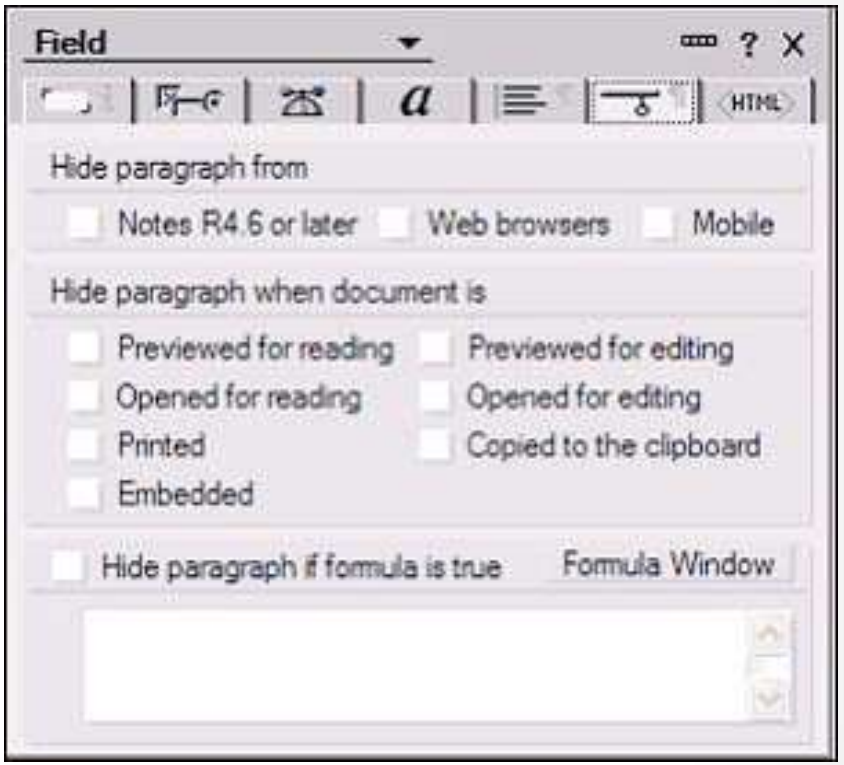
- Restrict more in-depth audits for elements that are exposed to the web
  - Views, Forms, Pages…
  - Ask to see config or profile documents (make sure they are protected)
- Review All Agents – Can be called from the web to run code. Can write to DB2, SQL, FTP, basically do anything.

Whitebox

- Check permissions on all design elements
- Check actions within design elements

Whitebox

- Field Access
- Depending on how the application is written, fields on public forms can be hidden.



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Default Files

- Names.nsf – The most important database
- Log.nsf – Shows events on server
- WebAdmin.nsf – A web version of admin client
- Help Files – Should never be left on the server

When upgrade a server, it could re-add databases you thought you deleted!!!

Where to Start?

- Talk to the Administrator – Learn about the different documents (server, config, internet site) of the NAB
- Learn the default ACL and how it is audited.
- Talk to the Developers – Its impossible to go through every element and to look at field security. Establish security practices

Where to Start?

Get a good tool

- Team Studio – Build Manager to write checks before a application is refreshed into production. Preventive Security!
- DominoScan II – NGS Software
- AppDetectivePro – Application Security Inc.
- PowerTools and ScanEz – Admin Tools

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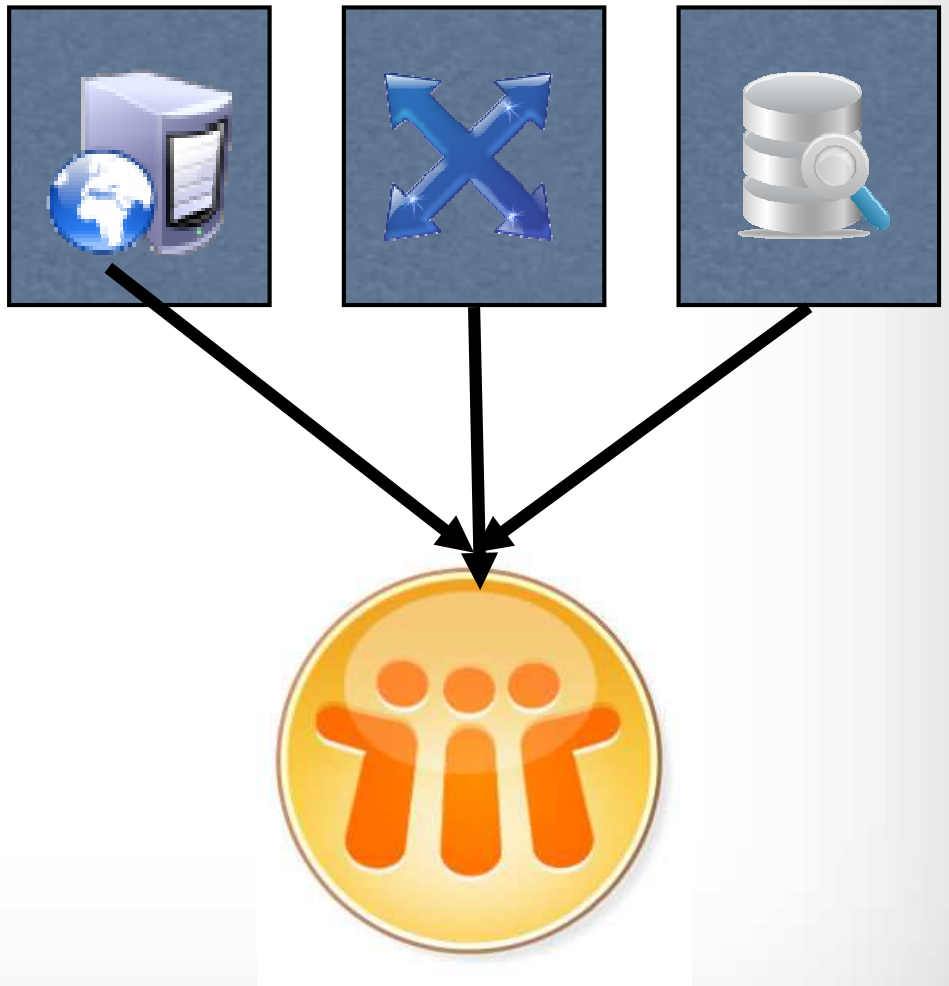
Architecture

- End users directly enter DB commands
- Cannot run arbitrary DB commands
- Who sets up ACLs in your org?



Questions? Comments? Insults?

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http://www.angelsofsecurity.com/domino.html