

IBM Connections Deep Dive

[Christoph Stöttner](#) – [Fritz & Macziol GmbH](#)



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CONNECT  **2** CLOUD



LONGANA

About me

- Christoph Stöttner
 - IBM Software Consultant at Fritz & Macziol
 - Specialized in the IBM Connections and IBM Domino Infrastructure
 - Bavarian
 - Linux and Scripting Lover, Blogger
 - Speaker at:

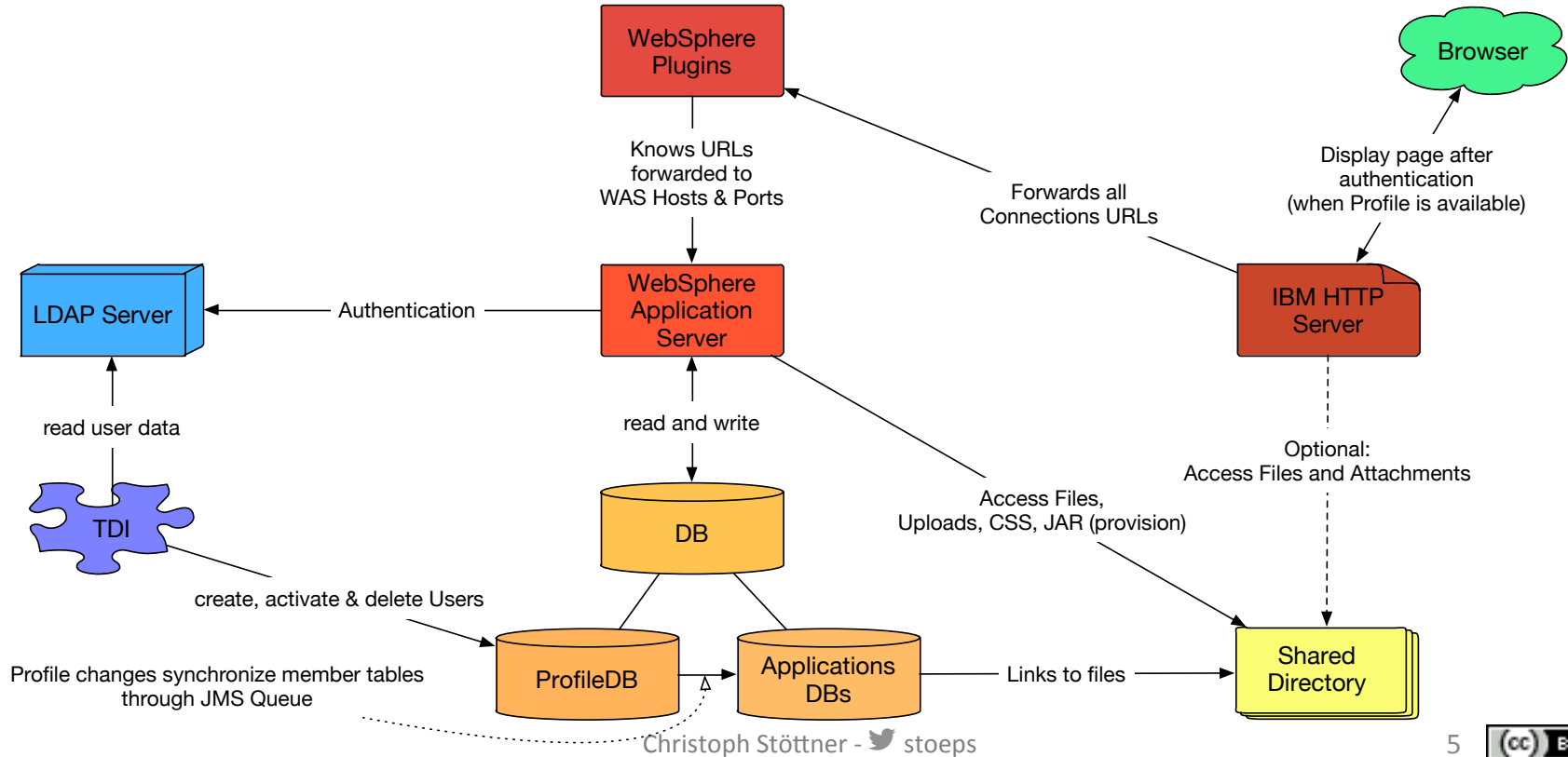


Agenda

- Components of IBM Connections
- WebSphere Application Server
- Infrastructure
- Troubleshooting
- System Requirements



Data flow & Interaction - IBM Connections



Goal

- No fear of IBM Connections
- Understand relationships between the components
- Understand configuration settings
- Troubleshooting Basics
 - log files
 - applications
 - Troubleshooting tools
 - Examples



Comment on paths

- all paths shown are Windows Path
 - e.g. D:\IBM\product
- Linux or AIX administrators can replace with
 - /opt/IBM/product



IBM CONNECTIONS

Components



System requirements

- <http://www-01.ibm.com/support/docview.wss?uid=swg27012786>
- Requirements should be strictly followed
 - IBM only supports the versions of requirements documents
 - Check regularly -> approve before installation or update
 - Check details and notes

System requirements example

- WebSphere Application Server

Application Servers

Prerequisite	Version	Prerequisite Minimum	Product Minimum	Components	Operating System Restrictions?	Notes	Details
WebSphere Application Server Network De					Yes	(1)(2)	View

Product support for prerequisite maintenance levels, current and future →

Deployment Unit	8.5.5	8.5.5.1	8.5.5.2	8.5.5.3	→
Server	✗	✓ (1)	✓ (2)	✗	✗

Notes: (1) (2) **All notes**

System requirements example (2)

Note 1

SYSTEM REQUIREMENTS DOCUMENTATION (for 8.5.5.1 support)

PM91417 - [Fix Central iFix for PM91417](#) - Partial application updates will not update JARs in non-active Java EE locations

PM94437: [Fix Central iFix for PM94437](#) - MINIMIZE THE NUMBER OF THREADS THAT WAIT ON THE LDAP CONTEXT POOL CREATION AFTER LDAP FAILURE

PI15998 - [Fix Central iFix for PI15998](#) - Hanging in the EJB deploy process due to a dead lock in JDT

Note* IBM Connections running on IBMi for V7R2M0 requires WAS v8.5.5.2 and IBM Connections v5.0 + CR1

Note 2

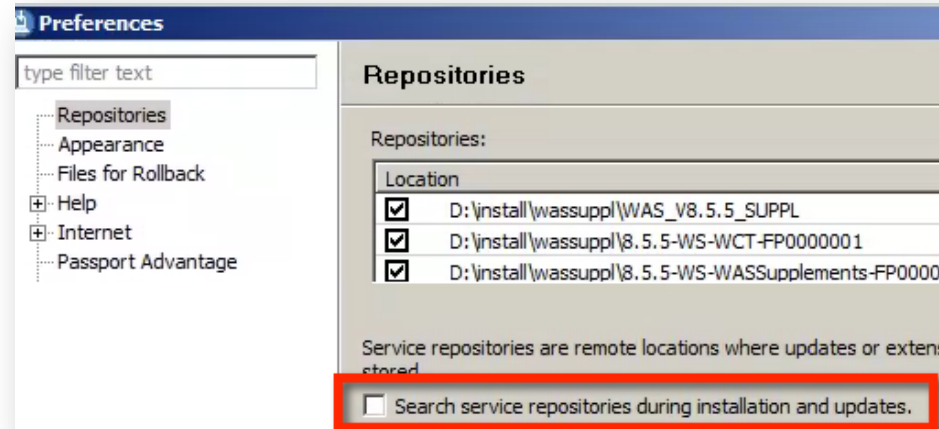
SYSTEM REQUIREMENTS DOCUMENTATION (for 8.5.5.2 support)

PI15998 - [Fix Central iFix for PI15998](#) - Hanging in the EJB deploy process due to a dead lock in JDT



Installation Manager

- Use a actual 32 bit install package
 - integrated IM in Connections, Forms often older
 - no need to update several times within one deployment
- Uncheck automatic updates



Browser support

- Official supported
 - Internet Explorer 8.0 – 11.0
 - Mozilla Firefox ESR 24, 26
 - Apple Safari 7.0
 - Google Chrome 31 (all OS)
- Nextgen / gen4 Theme
 - since Connections 4.5 CR2
 - IE without Compatibility Mode
- <http://www-969.ibm.com/software/reports/compatibility/clarity-reports/report/html/prereqsForProduct?deliverableId=1351088302698#!>



IBM CONNECTIONS

Deployments



Overview

- ~~Small Deployment < 1.000 registered Users~~
 - ~~1 Cluster all applications~~
- Medium Deployment 1.000 – 10.000 registered Users
 - several Clusters (Default: 3)
- Large Deployment about 10.000 – 100.000 registered Users
 - 1 Cluster for each application
 - you should use 2 or more nodes
- Large Deployment > 100.000 registered Users
 - additional Nodes
 - redundant database servers

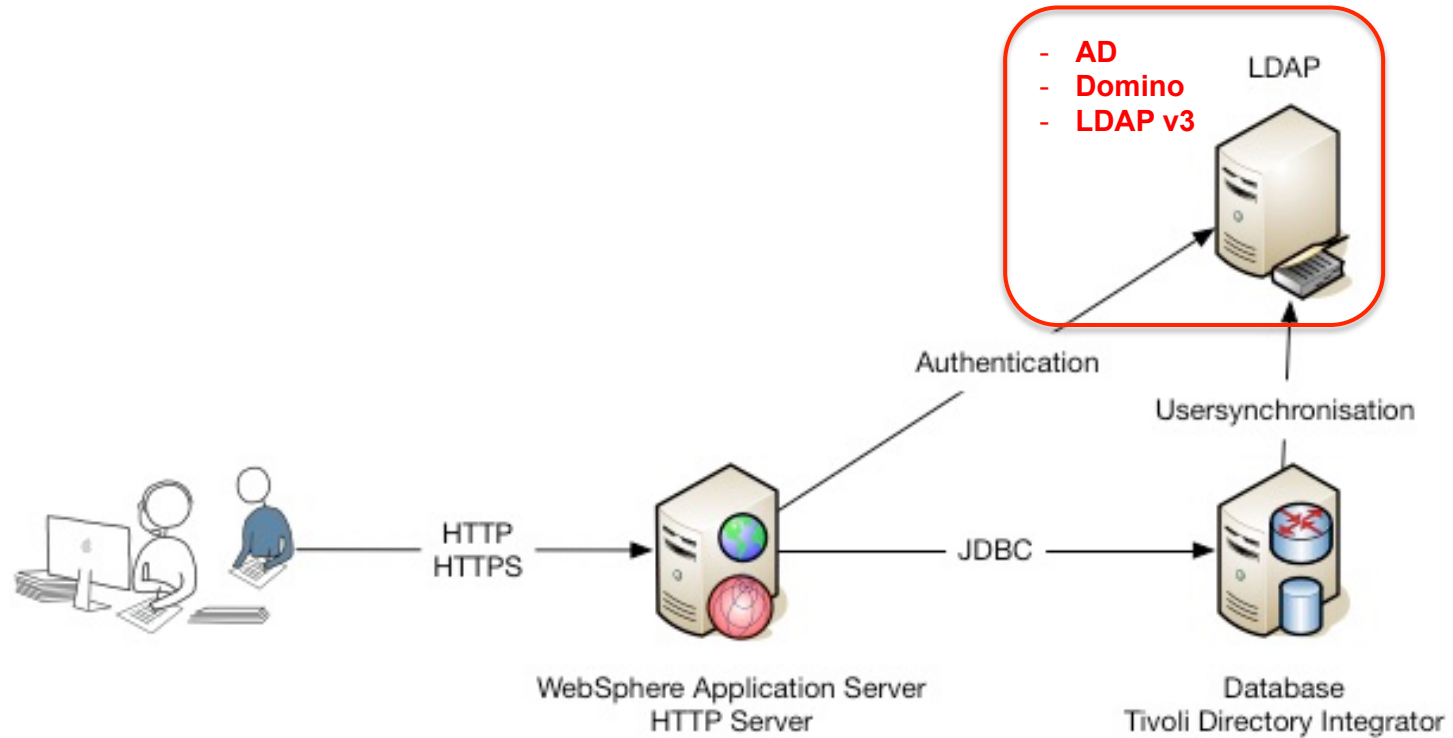


IBM CONNECTIONS

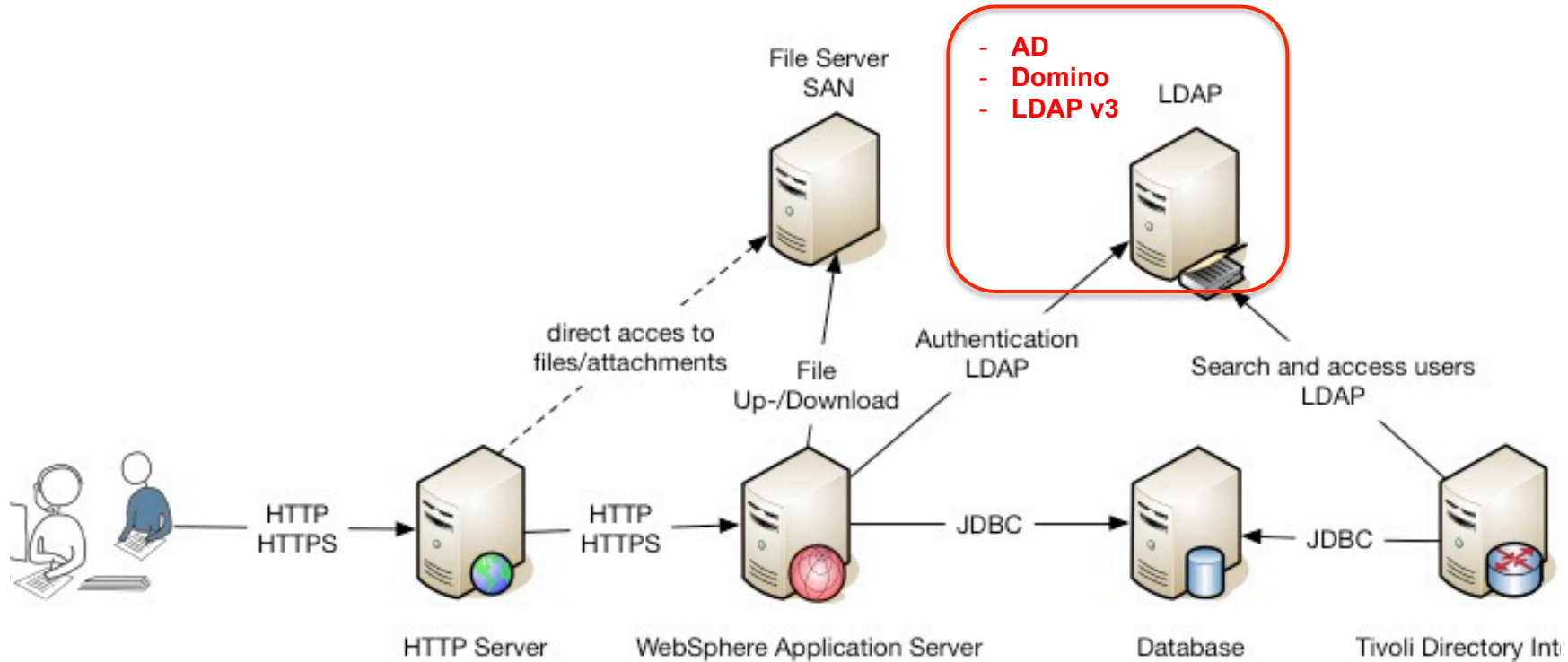
Infrastructure



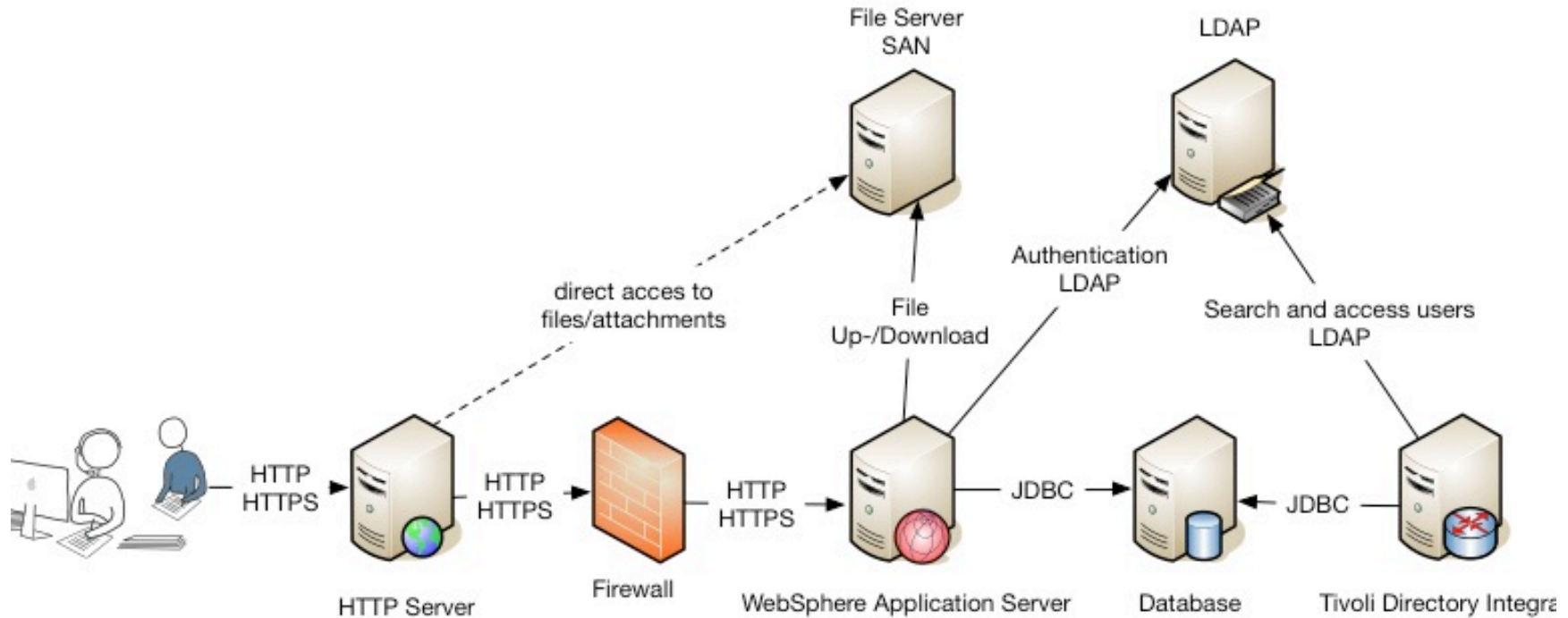
Minimum Infrastructure



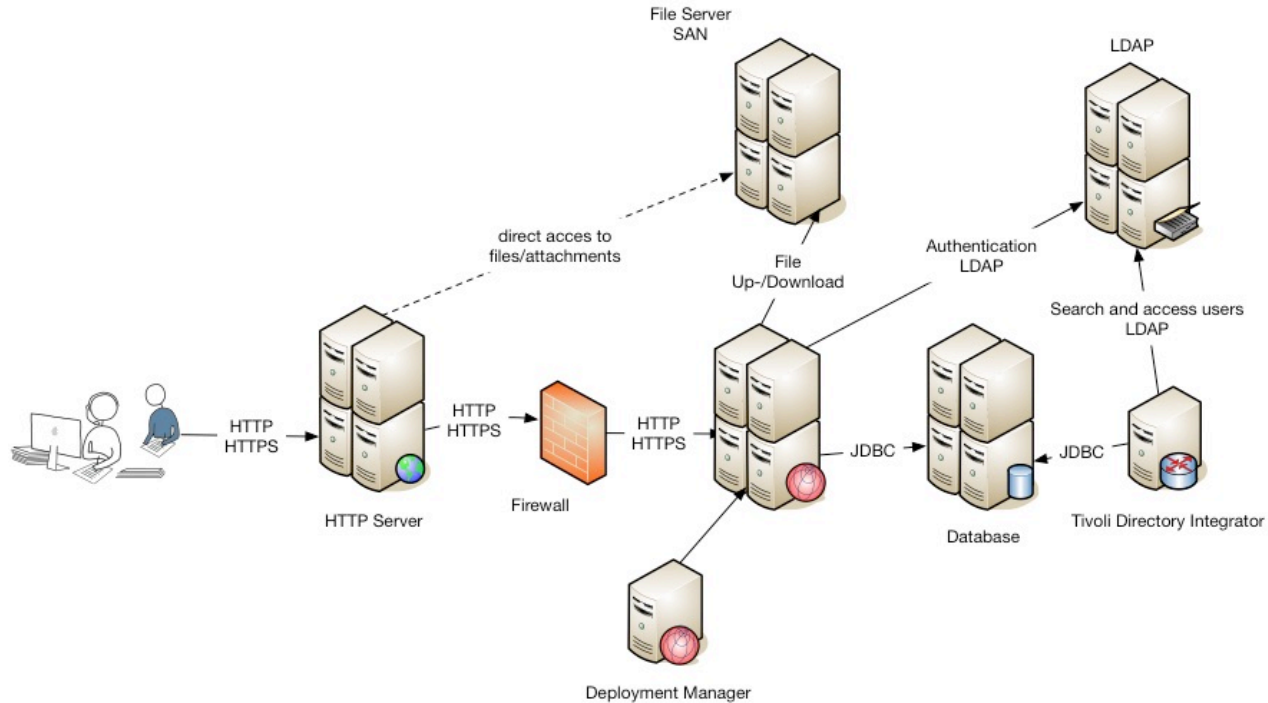
Infrastructure – advanced



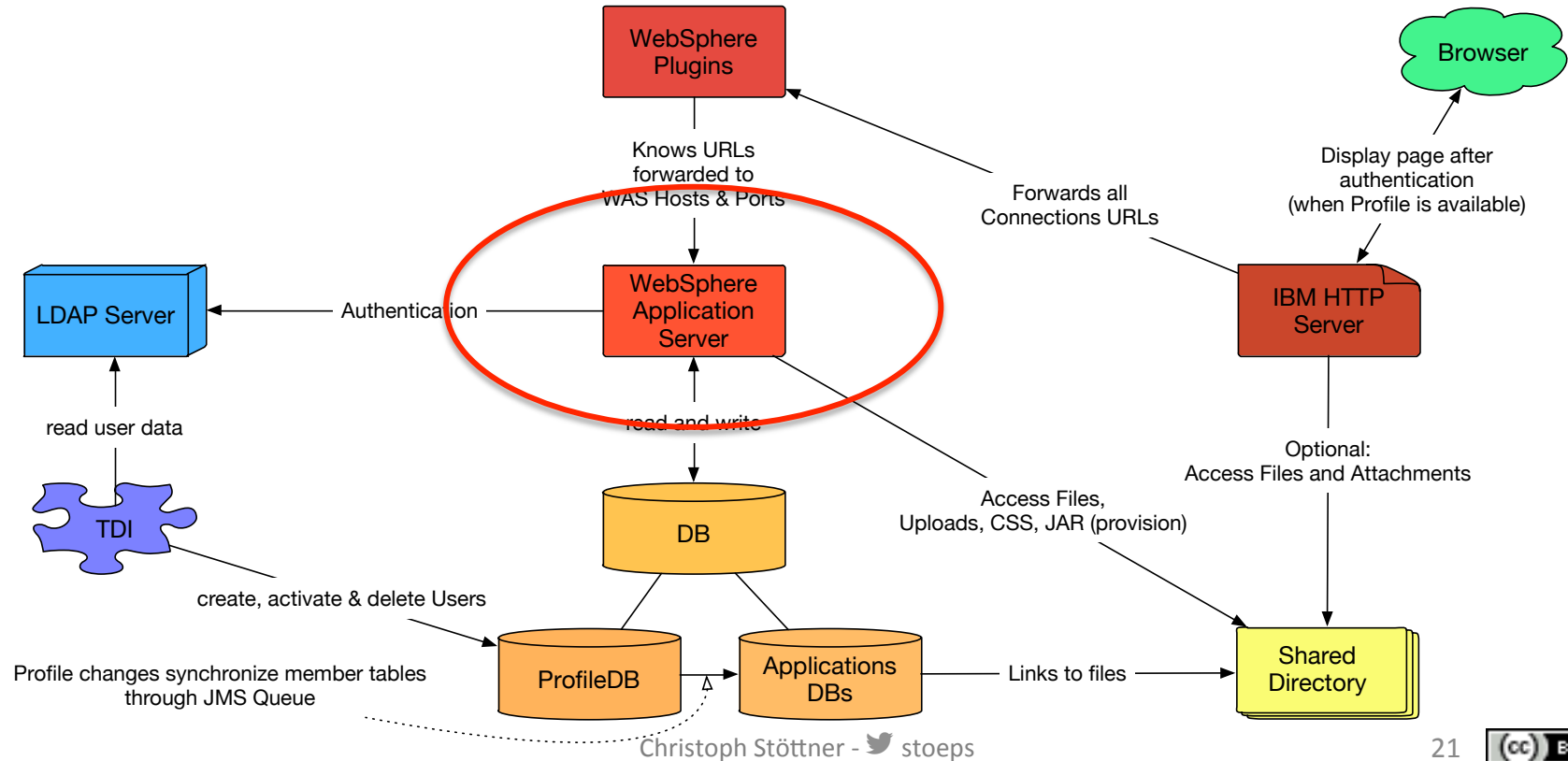
Infrastructure – external access



Infrastructure - HA



WebSphere Application Server - Basics



IBM WebSphere Application Server

- Cell
 - In a network deployment a cell can have multiple Nodes
 - SPOA through Deployment Manager
- Deployment Manager (dmgr)
 - Configuration server of a cell
 - manage the master configuration



IBM WebSphere Application Server

- Node
 - Group of application servers
 - each node is managed through the NodeAgent
- NodeAgent
 - synchronize configuration from Deployment Manager
 - copy new and changed files to Node Config



IBM WebSphere Application Server

- Application Server
- Cluster
 - one to n members
 - Loadbalancing and Failover with \geq two members
- Administration
 - Integrated Solution Console (http://was_host:9060/admin)
 - wsadmin.bat|sh (start within <Dmgr-profile>/bin)



Java Virtual Machine

- Seperate JVM
 - dmgr
 - nodeagent
 - application server
- each JVM has seperate settings for
 - logs
 - Java Heap Size
 - Java Generic
 - Garbage Collector



Compare WebSphere & Domino

IBM WebSphere AppServer

- Cell
- Node
- NodeAgent
- Deployment Manager
- Application Server

IBM Domino

- Domino Domain
- Domino Server (partitioned)
- Replicator task
- Administration Server



Paths

- WAS_HOME
 - D:\IBM\WebSphere\AppServer
 - /opt/IBM/WebSphere/AppServer
- Profiles
 - %WAS_HOME%\profiles | \$WAS_HOME/profiles
 - Dmgr01 (Default Deployment Manager)
 - AppSrv01 (Default 1. Node)
 - AppSrv02 (optional)

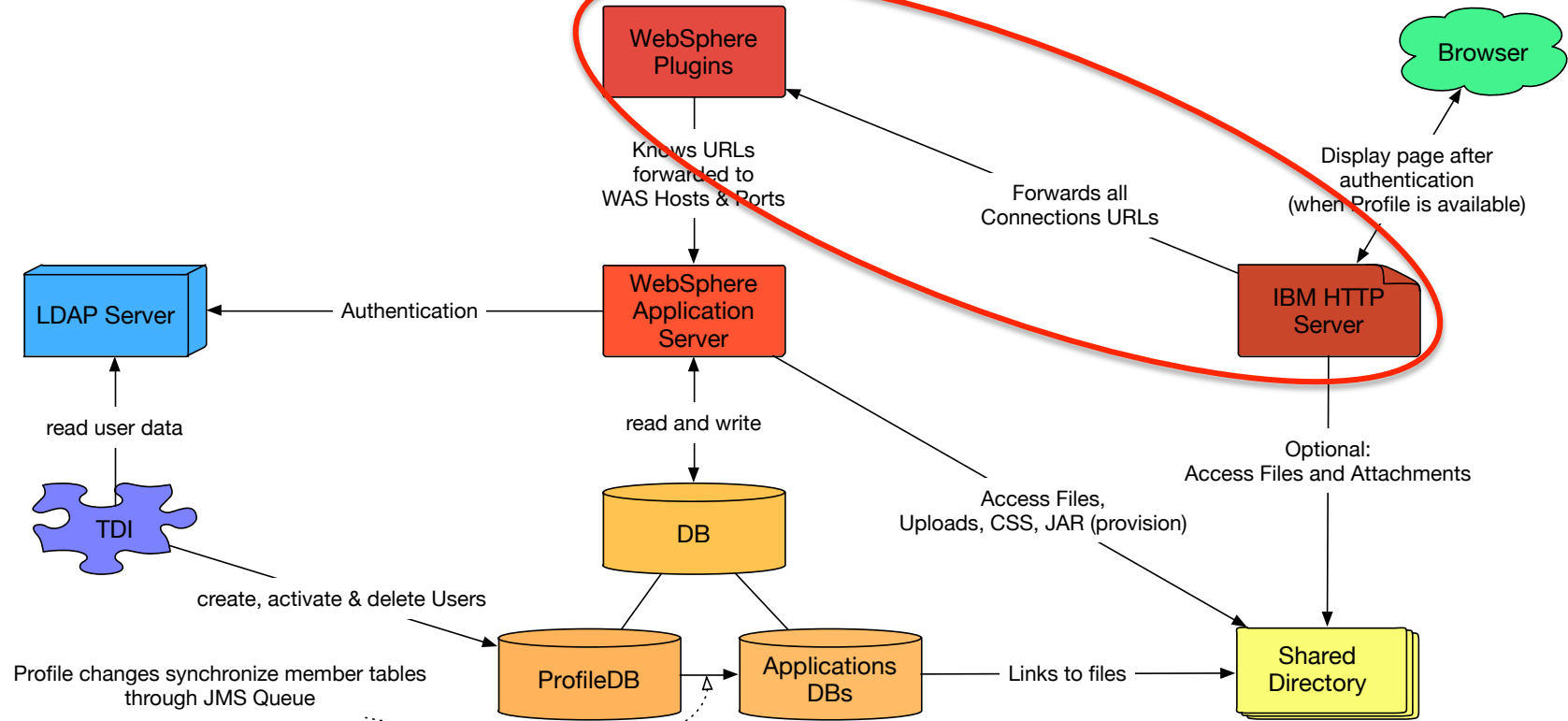


Log Files

- Midsize Deployment
 - \$WAS_HOME/profiles/AppSrv01/logs
 - InfraCluster_server1/SystemOut.log
 - Cluster1_server1/SystemOut.log
 - Cluster2_server1/SystemOut.log
- Large
 - \$WAS_HOME/profiles/AppSrv01/logs
 - ActivitiesCluster_server1/SystemOut.log
 - BlogsCluster_server1/SystemOut.log
 - ...



WebSphere Application Server - Basics



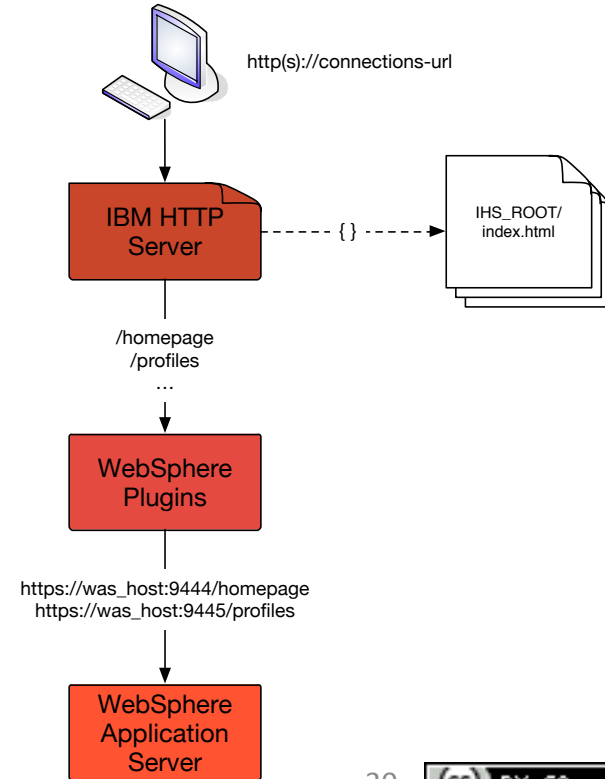
Christoph Stöttner - stoeps

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HTTP Server, Plugins & WebSphere AppSrv

- Interaction
- IHS_ROOT
 - D:\IBM\HTTPServer
 - /opt/IBM/HTTPServer
- WAS_PLG_ROOT
 - D:\IBM\WebSphere\Plugins
 - /opt/IBM/WebSphere/Plugins
- Keystore
 - Check SSL Key validity



Paths

HTTP Server

- Configuration
 - %IHS_ROOT%\conf\
 - httpd.conf
- Logs
 - %IHS_ROOT%\logs\
 - access.log
 - error.log

WebSphere Plugins

- Configuration
 - %WAS_PLG_ROOT%\config\
 - webserver1 (Bsp.)
- Logs
 - %WAS_PLG_ROOT%\logs\
 - webserver1 (Bsp.)



WebSphere Plugins

- Handle HTTP(S) requests from IHS to WebSphere Server
- Path:
 - changed from Version 7 to 8!!
 - ISC (even 8.5.5) set the old path as default, when adding a webserver
 - Version 7:
 - D:\IBM\HTTPServer\Plugins\logs\cnxwebserver1
 - Version 8:
 - D:\IBM\WebSphere\Plugins\logs\cnxwebserver1



WebSphere Plugins (2)

WebSphere software

Welcome wasadmin

Cell=cnxwinCell01, Profile=Dmgr01

View: All tasks

Servers

- Welcome
- Guided Activities
- Servers**
 - New server
 - Server Types
 - WebSphere application servers
 - WebSphere proxy servers
 - Generic servers
 - Version 5 JMS servers
 - WebSphere MQ servers
 - Web servers**
 - Clusters
 - DataPower
 - Core Groups

Web servers

Web servers

Use this page to view a list of the installed web servers.

Preferences

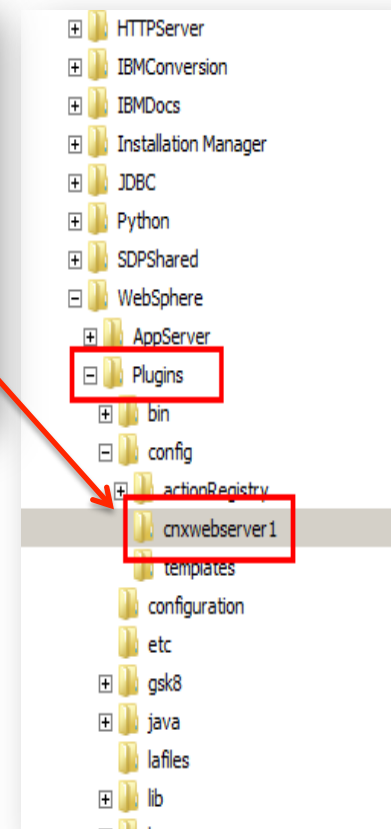
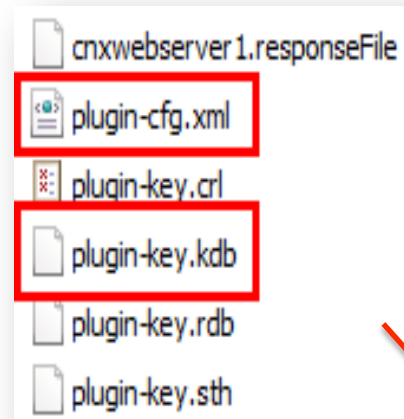
Generate Plug-in Propagate Plug-in New... Delete Templates... Start Stop Terminate

Select	Name	Web server Type	Node	Host Name	Version	Status
<input type="checkbox"/>	cnxwebserver1	IBM HTTP Server	webserverNode01	cnxwin.stoeps.local	Not applicable	

Total 1

WebSphere Plugins (3)

- Configuration directory contains
 - Plugin-cfg.xml
 - Plugin configuration
 - Ports, hostnames from WebSphere
 - Plugin-key.kdb
 - Keystore from WebSphere keys
 - Contains Root Certifier from WebSphere
 - Plugin-key.sth
 - Stashfile Keystore
 - Password for Keystore
- Important:
do not use plugin-key.kdb for IHS SSL Keys



plugin-cfg.xml

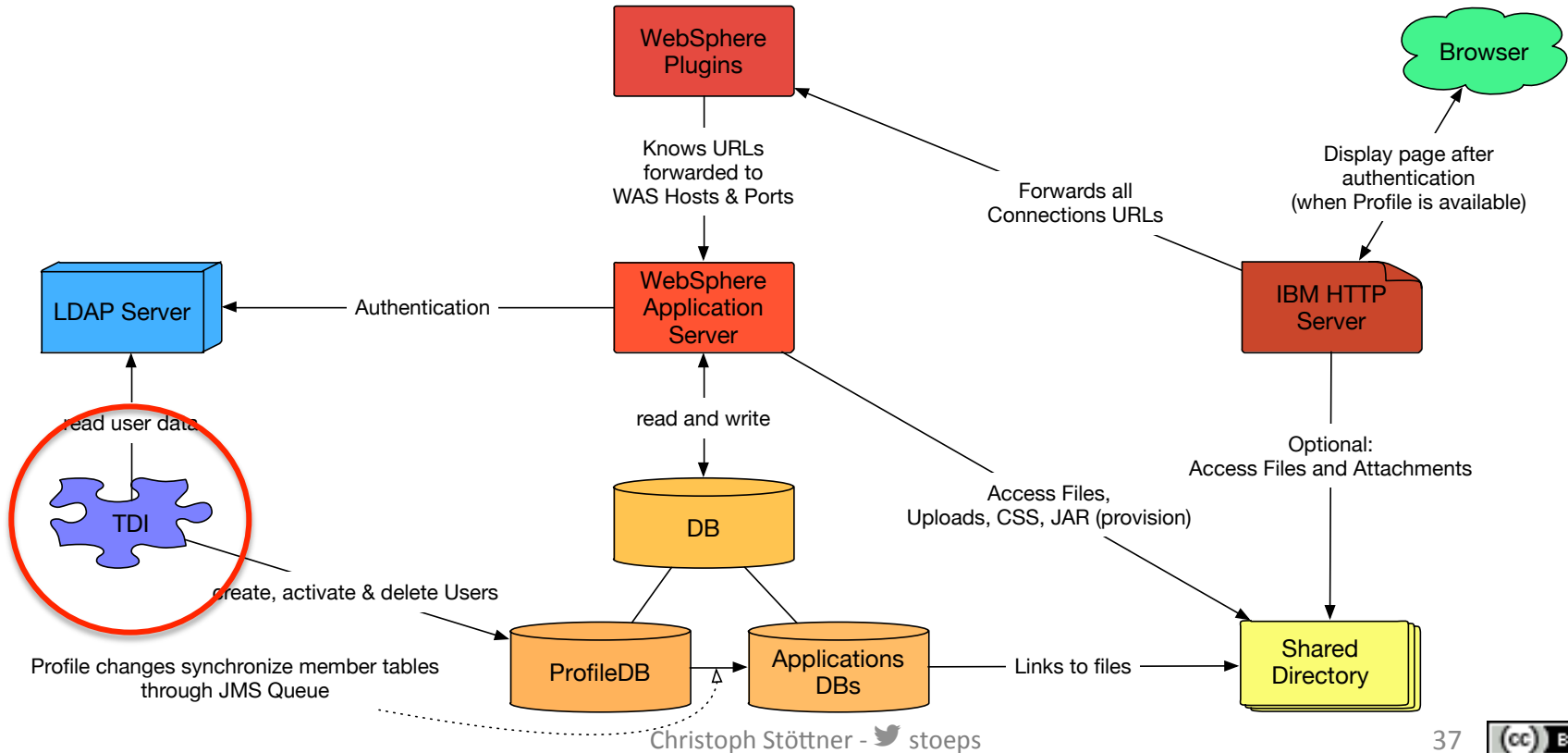
```
<UriGroup Name="default_host_InfraCluster_URIs">
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/oauth2/*"/>
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/editliveforconnections/*"/>
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/homepage/*"/>
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/news/*"/>
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/connections/proxy/*"/>
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/help/*"/>
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/connections/opensocial/*"/>
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/search/*"/>
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/moderation/proxy/*.jsv"/>
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/moderation/proxy/*.jsw"/>
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/moderation/proxy/j_security_check"/>
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/moderation/proxy/ibm_security_logout"/>
  <Uri AffinityCookie="JSESSIONID" AffinityURLIdentifier="jsessionid" Name="/moderation/proxy/servlet/*"/>
</UriGroup>
<Route ServerCluster="InfraCluster" UriGroup="default_host_InfraCluster_URIs" VirtualHostGroup="default_host"/>
```

plugin-cfg.xml (2)

- Ports
- Urls
- Route to Application Servers

```
<VirtualHostGroup Name="default_host">
  <VirtualHost Name="*:9080"/>
  <VirtualHost Name="*:80"/>
  <VirtualHost Name="*:9443"/>
  <VirtualHost Name="*:5060"/>
  <VirtualHost Name="*:5061"/>
  <VirtualHost Name="*:443"/>
  <VirtualHost Name="*:9081"/>
  <VirtualHost Name="*:9444"/>
  <VirtualHost Name="*:9082"/>
  <VirtualHost Name="*:9445"/>
  <VirtualHost Name="*:9083"/>
  <VirtualHost Name="*:9446"/>
  <VirtualHost Name="*:9084"/>
  <VirtualHost Name="*:9447"/>
  <VirtualHost Name="*:9085"/>
  <VirtualHost Name="*:9448"/>
</VirtualHostGroup>
```

Tivoli Directoy Integrator



Tivoli Directory Integrator

- TDI_ROOT
 - D:\IBM\TDI\V7.1.1
- TDISOL
(do not use TDI Population from Wizards, copy Connections\TDISOL)
 - D:\IBM\tdisol
- Logs
 - %TDISOL%\logs\ibmdi.log
- Employee.*
 - .error
 - .update
 - .skip



map_dbrepos_from_source.properties

- Configuration LDAP / Database mapping
- Important (must be unambiguous)
 - email
 - uid
 - guid
- Connections shows CN, when a User creates something
 - givenname surname
- Be careful with mapping (disable edit within profiles)
 - description
 - about



profiles_tdi.properties

- LDAP
 - Bind User
 - source_ldap_user_login=cn=Bind LDAP,ou=users,o=stoeps
 - Bind Passwort {protect}-parameter will be encrypted after starting sync_all_dns.bat
 - {protect}-source_ldap_user_password={encr}RU/IYGikSAnf/DDYN1hW6
 - LDAP Host
 - source_ldap_url=ldap://mail.stoeps.local:389
 - Base DN
 - source_ldap_search_base=o=stoeps
 - Search Filter (User filter for synchronisation)
 - source_ldap_search_filter=(&(uid=*)(mail=*))



profiles_tdi.properties (2)

- Database
 - Host, Port, DB (dbrepos_jdbc_url=jdbc:db2://cnxwin.stoepe.local:50000/PEOPLEDDB)
 - Password ({protect}-dbrepos_password={encr}Ua1BTSYdmu9ZDo662geoLc8C0=)
- Hash
 - sync_updates_hash_field=uid (uid, email or guid)
 - is used to find matching entries between DB and LDAP
 - important to sync e.g. renamed users
 - uid & email get changed when Domino renames a User
 - GUID (Doc ID) change, when you copy and paste person documents
- debug_*=false | true or etc/log4j.properties



Create, update & delete User

- User Synchronization
- `sync_all_dns.bat | sh`
 - create & update
 - delete or inactivate
 - `sync_all_dns.lck`
 - run regularly



Create, update & delete User (2)

- `collect_dns.bat`
 - create a list of users with defined search filter
 - write to `collect.dns`
- `populate_from_dn_file.bat`
 - create & update users listed in `collect.dns`
 - no delete or inactivate
 - always use uid to find matching entries between LDAP & database



fill_*.bat

- Following fields are not directly shown in Profiles
 - countryCode
 - deptNumber
 - organization
 - workLocationCode
- TDISOL/samples
 - example csv

Possible errors

- New users does not appear in Profiles
 - sync_all_dns.lck wasn't deleted
 - run collect_dns.bat
 - check if user is listed
 - LDAP Search
 - employee.error, employee.skip
 - check Log-File (after activating debug)
 - find possible validation errors



IBM CONNECTIONS

User management



GUID, UID, UUID

- UID
 - LDAP attribute
 - Shortname in Domino
 - sAMAccountName in AD
- GUID
 - LDAP attribute
 - SSID in AD, DocID in Domino
- UUID
 - unambiguous ID of users or objects in Connections databases



Connections Users

- each user need a profile in peopleDB
- loginItems must be unambiguous
 - uid
 - E-Mail
 - CN (if defined)
- deactivate User
 - do not edit the database directly
 - `execfile("profilesAdmin.py")`
`ProfilesService.inactivateUser("john.doe@example.com")`
 - resync with `sync_all_dns.bat`



Returning User | UID recycle

- When you delete a user in LDAP, the user is deactivated or deleted on next sync_all_dns
- UID reused or User comes back
 - depends on sync_updates_hash_field
 - UID
 - all profile fields updated to new values
 - old documents are reassigned to User with UID
 - bad if it is an other User



Returning User | UID recycle (2)

– GUID

- new User will not be created, because GUID changed
- duplicate UID errors appear in the log
- returning user:
 - populate_from_dn_file (hash to uid)
- UID recycle
 - you have to rename the uid of the old user (ProfilesService)!
 - Synchronisation is possible after this



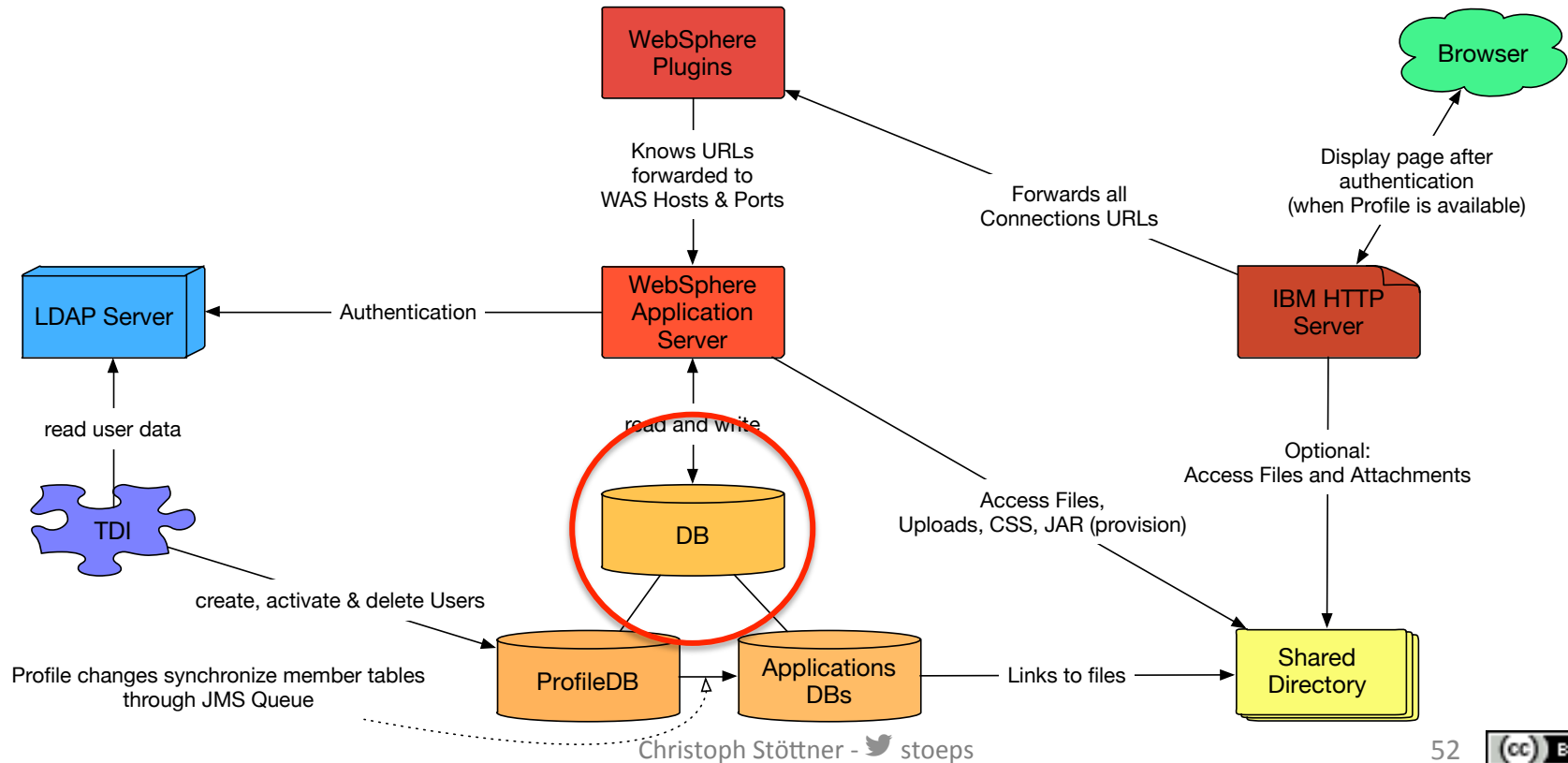
Returning User | UID recycle (3)

- User returns with different UID
- Remap old documents

```
ProfilesService.swapUserAccessByUserId(„oldGUID“, „newGUID“)  
ProfilesService.publishUserDataByUserId(„newGUID“)
```



Database Server

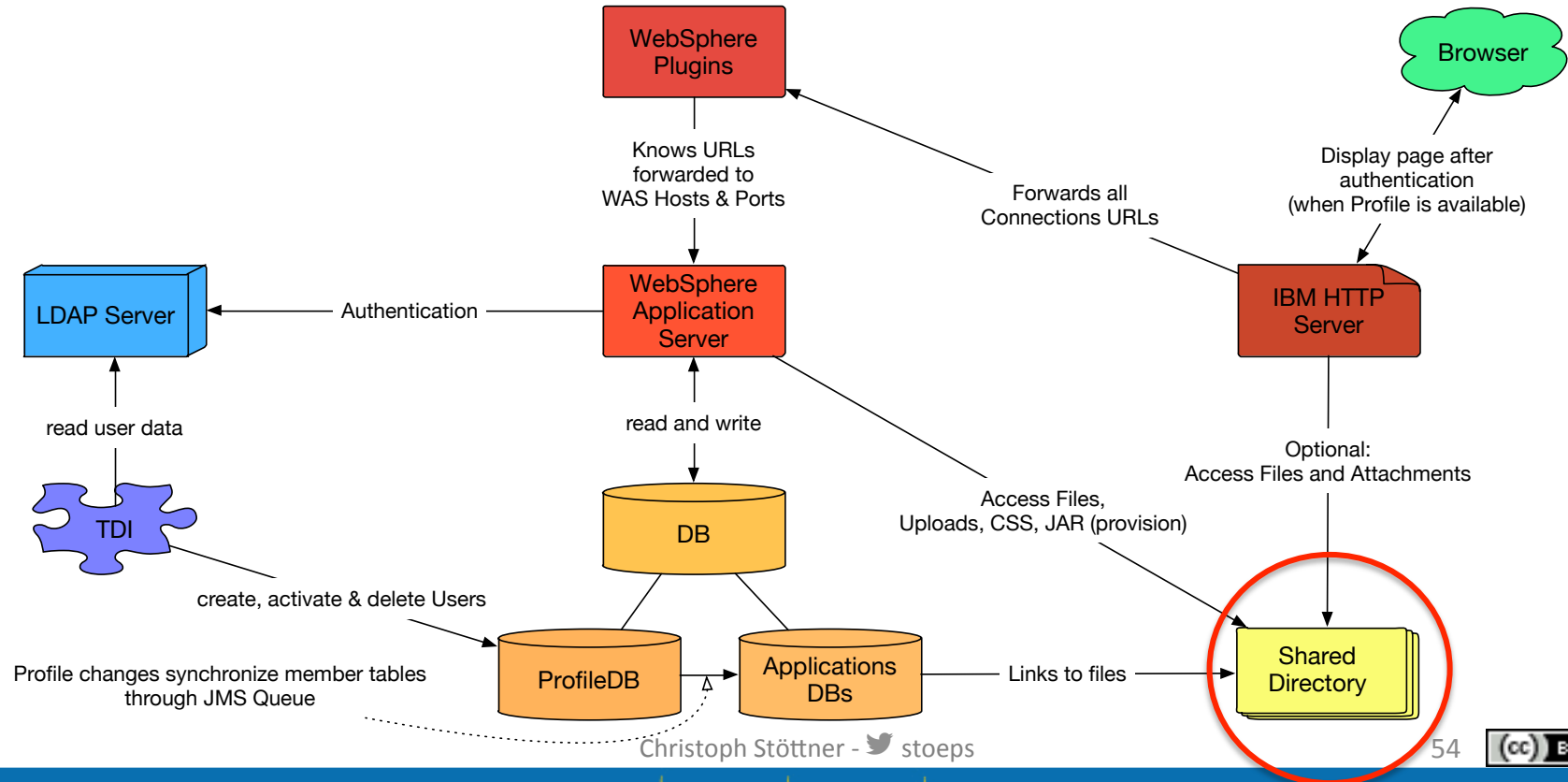


DB2

- License included with IBM Connections
- Tables
 - not documented
 - no Support after direct edit the databases
- Troubleshooting
 - db2diag.log



Shared Directory



Shared Directory

- Do not use local file paths
 - when adding 2. Node you need a network share
 - all Nodes must use the same path or URI
 - /opt/icshared
 - f:
 - [\\san-host\connections](#)
 - path must have a high availability
 - Connections must be restarted, when network connection drops
 - NFS SMB
 - you should disable virus scanning in Shared Directory
- Microsoft Windows Service: Local System has no network access



IBM CONNECTIONS

Configuration



Connections XML Configurations

- hold configuration of
 - IBM Connections general
 - Connections features
- Configuration Change
 - Check Out XML to temporary folder
 - Change config
 - Check In
 - Do not edit the configuration directly
 - Syntax validation on Check In
 - Synchronize Nodes
 - Restart Connections or App (depends on change)



Configuration backup

- Do not create backups in the config folder
- WebSphere reads all files in these folders
- Troubleshooting more complicated
- You can use `WAS_ROOT\bin\backupConfig.bat`



IBM CONNECTIONS

Search



Search serverStatus

- http://your_connections_server/search/serverStatus
 - J2EE Rolle Admin in Search App is needed
 - feeds and seedlists validation
 - last log messages
 - general search configuration
- When you install CCM and do not configure it
 - Search will never finish



Configuration

- File Extraction binaries should be started local
 - often problems when started from network
- Dictionaries
 - good idea
 - weird search results / not consistent search



TROUBLESHOOTING

Network



Name Lookup

- Check if all hosts can lookup each other
- Connections use only one hostname
 - e.g. connections.example.com
 - even when you use multiple webserver, the virtual host name must be the same
 - configured in LotusConnections-config.xml
- Tools
 - nslookup
 - dig
 - host



Changing Hostname

- often complicated, always check possibilities in the product documentation
 - WebSphere Application Server
 - DB2
- Easier
 - Connections URL



Change Connections URL

- Problems
 - Homepage (ActivityStream)
 - Blogs
- Change
 - DNS
 - httpd.conf (virtualhost for new name, RewriteRule for old name)



Change Connections URL (2)

- Change
 - New SSL Key (or wildcard key)
 - import new key to WebSphere Truststore
 - URLs
 - Blogs
 - change old URLs through wsadmin
 - News
 - Entries disappear after some days



TROUBLESHOOTING

General



Possible Errors – Internal Server Error

- Browser displays

Internal Server Error

The server encountered an internal error or misconfiguration and was unable to complete your request.

Please contact the server administrator, you@your.address and inform them of the time the error occurred, and anything you saw in this message.

More information about this error may be available in the server error log.

IBM_HTTP_Server at cnxwin.stoepts.local Port 443

- Error message in IHS_ROOT/logs/error.log: error 500
 - A generic error message



Possible reasons

- Application Server or Application not started
 - Check with ISC
- SSL Root Certificate not imported in WAS Truststore
 - Import Root Certificate
 - sometimes seen only host keys imported, after key rollover not longer valid



Possible reasons (2)

- SSL Key expired
 - IHSROOT/logs/error.log
 - GSK_ERROR_BAD_CERT
 - PLUGIN_ROOT/logs/webserver1/http_plugin.log
 - SSL0221E: SSL Handshake Failed, Either the certificate has expired or the system clock is incorrect



App not available

- Error in files-config.xml (in this case)
 - wouldn't happen when use Check Out/In



Files is not available

The application is not configured correctly. Contact your administrator about resolving this issue.



Error on all / some apps

- Error in *-config.xml
 - validate through Check In/Out
- User synchronisation after rename not complete
 - ApplicationMemberService.syncAllMembersByExtId
- Profile not created through TDI



Application not accesible

- Application not mapped to webserver
 - Generate plugin-config and copy to webserver
 - Restart Webserver
-

Not Found

The requested URL /forums/ was not found on this server.

IBM_HTTP_Server at cnxwin5.stoepe.local Port 80



RESSOURCES



Documentation / System Requirements

- Wiki until Connections 4.5
 - <http://www-10.lotus.com/ldd/lcwiki.nsf/xpViewCategories.xsp?lookupName=Product%20Documentation>
- IBM Knowledge Center (since mid 2014)
 - http://www-01.ibm.com/support/knowledgecenter/SSYGQH_5.0.0/welcome/welcome_admin.html?lang=en
- System Requirements Connections 5
 - <http://www-969.ibm.com/software/reports/compatibility/clarity-reports/report/html/prereqsForProduct?deliverableId=1351088302698#!>



Tools: (intercept) Proxy

- examine communication between Browser and server
- Fiddler
 - <http://www.telerik.com/fiddler>
 - Windows
- Burpsuite
 - <http://portswigger.net/burp/>
 - Linux, Windows & Mac OS X
 - depends on Java
 - Intercept mode



Tools: DB Client

- until DB2 9.7: db2cc
- all versions: DB2 Data Studio
 - View and Edit table entries
 - No support when you edit!
 - Good to check entries of Users
- Generic JDBC Client
 - dbeaver



Tools: Browser Plugins

- CipherFox Secure
 - Display current SSL cipher
- CookieWatcher or Cookies Manager
- Empty Cache Button
- Firebug
 - Check load time
 - Source Code
 - Error Console
- Firesizer
- Javascript Debugger
- Live HTTP headers
- User Agent Switcher



Tools: Editor, Tail

- Configuration Changes
 - Windows: notepad++, Ultraedit, Atom
 - Linux: vim, geany, atom
- Log Files
 - Windows: baretail.exe, mtail, LogExpert
 - Linux: tail -f, multital



Tools: LDAP / Network

- LDAP Browser
 - Apache Directory Studio
 - Softerra LDAP Browser
 - Softerra LDAP Admin
 - Jxplorer
 - ldapsearch
- Not enough?
 - Wireshark
 - tcpdump



THANK YOU

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