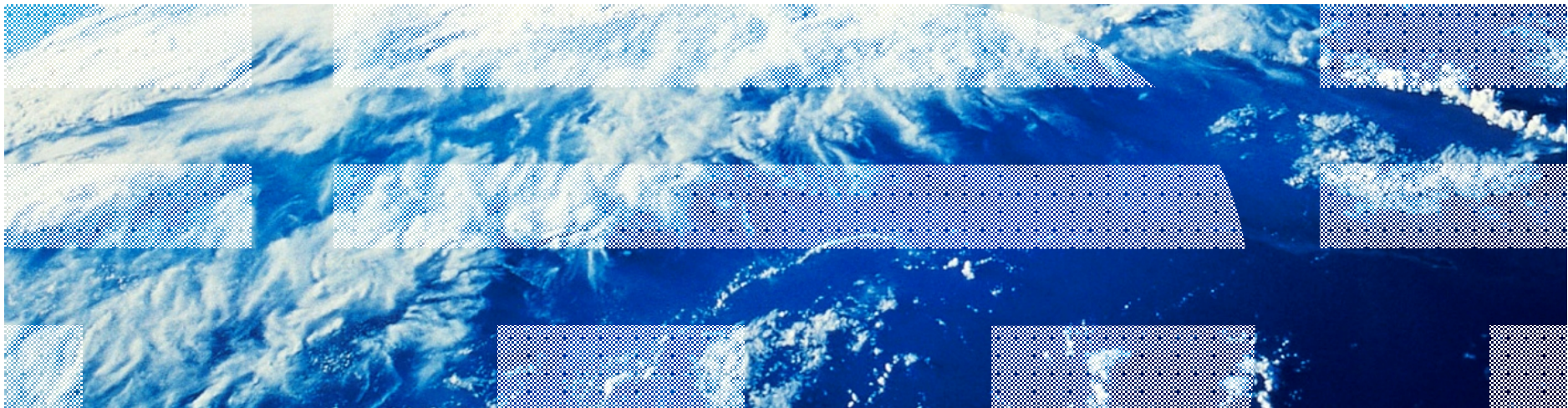


Integrating z/VSE into an Identity Management System

Ingo Franzki, IBM



Trademarks

The following are trademarks of the International Business Machines Corporation in the United States, other countries, or both.

Not all common law marks used by IBM are listed on this page. Failure of a mark to appear does not mean that IBM does not use the mark nor does it mean that the product is not actively marketed or is not significant within its relevant market.

Those trademarks followed by ® are registered trademarks of IBM in the United States; all others are trademarks or common law marks of IBM in the United States.

For a complete list of IBM Trademarks, see www.ibm.com/legal/copytrade.shtml:

*, AS/400®, e business(logo)®, DBE, ESCO, eServer, FICON, IBM®, IBM (logo)®, iSeries®, MVS, OS/390®, pSeries®, RS/6000®, S/30, VM/ESA®, VSE/ESA, WebSphere®, xSeries®, z/OS®, zSeries®, z/VM®, System i, System i5, System p, System p5, System x, System z, System z9®, BladeCenter®

The following are trademarks or registered trademarks of other companies.

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries. Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

ITIL is a registered trademark, and a registered community trademark of the Office of Government Commerce, and is registered in the U.S. Patent and Trademark Office.

IT Infrastructure Library is a registered trademark of the Central Computer and Telecommunications Agency, which is now part of the Office of Government Commerce.

* All other products may be trademarks or registered trademarks of their respective companies.

Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

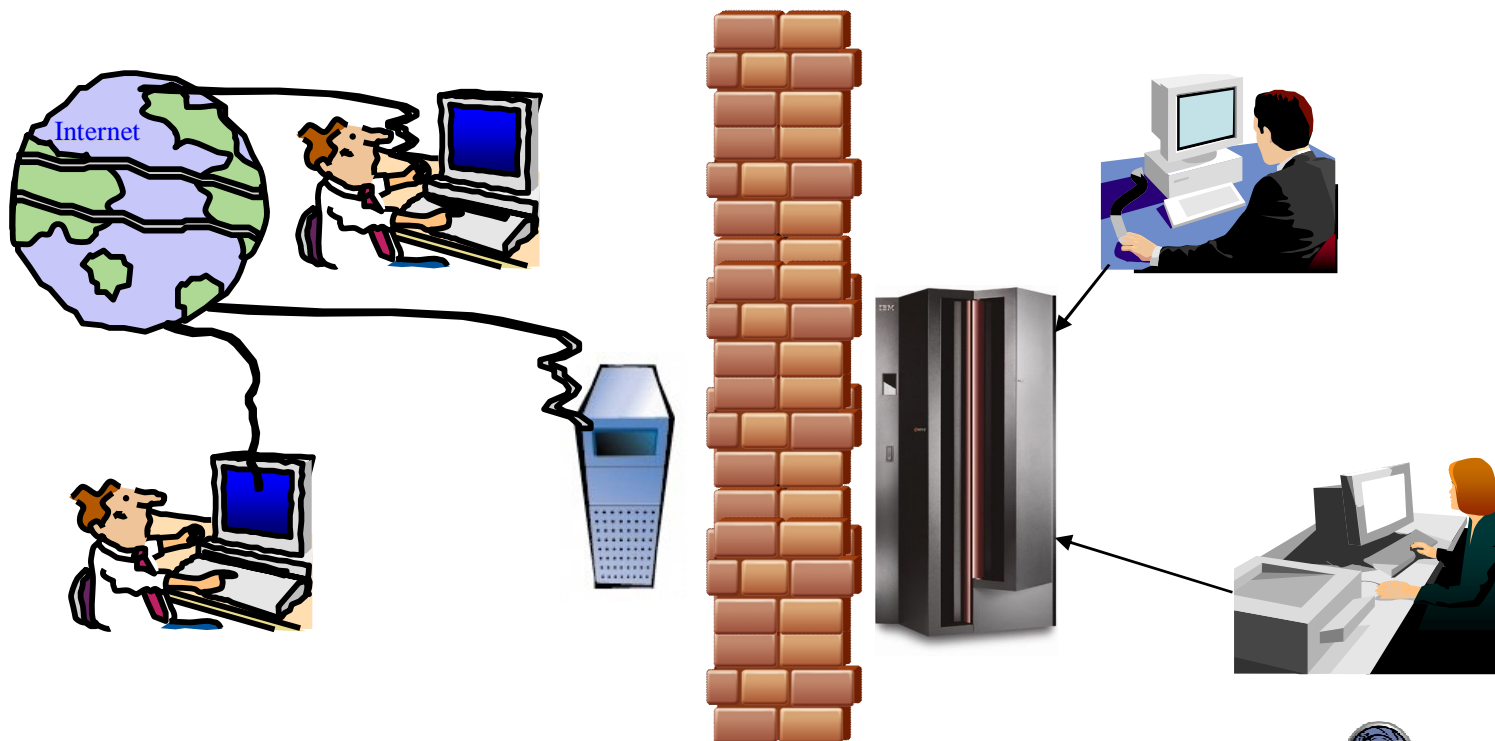
Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

Situation today

§ Separate User-ID Management Systems for z/VSE and the others (Unix, Linux, Windows)

- Duplicate User IDs
- No automatic synchronisation



Situation today - Risks

- § User-ID management is very complex if different systems need to be updated
- § Some User-IDs do not explicitly show who is the owner
 - e.g. z/VSE 4 character User-IDs
- § Difficult to enforce corporate policies, like password renewal, auditing, ...
- § Examples:
 - If an employee leaves the company
 - Deactive **all** of his User-IDs on **all** systems
 - If an employee moves to another department
 - Permissions to access files/programs needs to be adjusted according to his new job on **all** systems
- § If you miss to update one system, the employee (or others) may still have access to confidential data



Solution: Centralized Identity management

§ Goal:

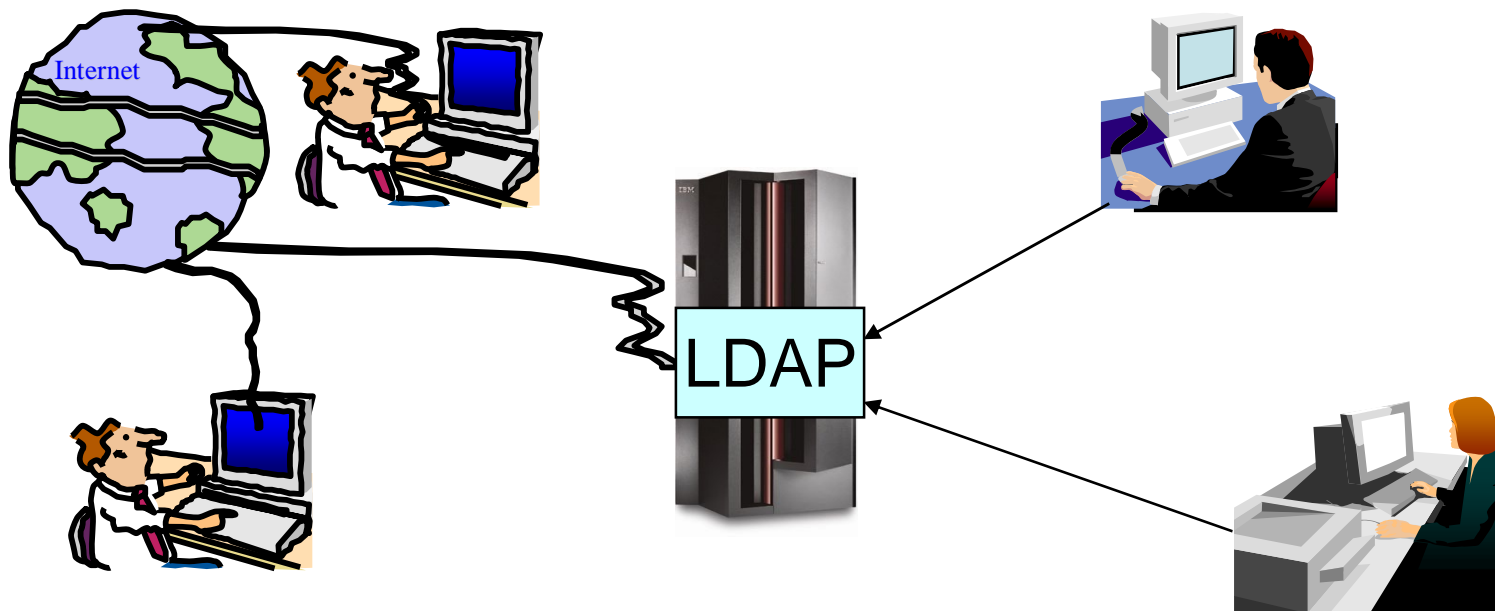
- Only **ONE** place where all Identity related information is stored
 - User-IDs
 - Permissions
 - Groups, Roles
- All surrounding systems access that single Identity Management System
- Changes to a User-ID (deactivation, modification) automatically affect all systems, without any additional actions
- Corporate policies can easily be enforced
- Self service Help-Desk can easier be accomplished
 - e.g. Password reset, User-ID unlock, ...



Solution: Centralized Identity management

§ Identity Management Systems typically use a Directory to store ID related information

–Protocol to access the directory: **LDAP**



What is LDAP ?

- § The **Lightweight Directory Access Protocol** (LDAP) is an application protocol for querying and modifying directory services running over TCP/IP
 - A **directory** is a set of objects with similar attributes organized in a logical and hierarchical manner.
 - The most common example is the telephone directory, which consists of a series of names (either of persons or organizations) organized alphabetically, with each name having an address and phone number attached.
- § Due to this basic design (among other factors) LDAP is often used by other services for authentication
- § An **LDAP directory tree** often reflects various political, geographic, and/or organizational boundaries, depending on the model chosen.
- § LDAP deployments today tend to use Domain name system (DNS) names for structuring the topmost levels of the hierarchy.
- § Deeper inside the directory might appear entries representing people, organizational units, printers, documents, groups of people or anything else that represents a given tree entry (or multiple entries).
- § See: Wikipedia:
http://en.wikipedia.org/wiki/Lightweight_Directory_Access_Protocol

LDAP Example: IBM Bluepages

The screenshot shows the JXplorer application window. The address bar contains 'address ='. The left pane shows a tree view with 'World' > 'ibm.com' > 'bluepages' > 'de' > '104903724' selected. The main pane shows a table of LDAP attributes for the selected entry.

attribute type	value
cn	Ingo Franzki
objectclass	person
objectclass	organizationalPerson
objectclass	ibmPerson
objectclass	ePerson
objectclass	top
sn	Franzki
uid	104903724
alternatenode	DEVN
alternateuserid	IFRANZKI
backup	uid=109572724,c=de,ou=bluepages,o=ibm.com
backupcountrycode	724
backupserialnumber	109572
buildingname	06
c	de
callupname	Franzki, Ingo
co	Germany
coreDataIntegrity	Y
dept	3229
directoryalias	GERMSUED
div	EL
divdept	dept=3229,div=EL,ou=bluepages,o=ibm.com

Number of search results: 1

LDAP Example: IBM Bluepages

§ Search for all Entries with „dept=3229“

The screenshot shows a 'Search' dialog box with the following fields and options:

- Filter Name:
- Start Searching From:
- Alias Options:
 - Resolve aliases while searching.
 - Resolve aliases when finding base object.
- Search Level:
 - Select Search Level:
- Information to retrieve:
- Build Filter | Join Filters | Text Filter
- Not
- dept Equal To 3229
- Buttons: More, Less, Save, Load, View, Search, Cancel, Help

LDAP Example: IBM Bluepages

The screenshot shows the JXplorer application window. The left pane displays a tree view of the LDAP directory structure, with the entry '001240724' selected under the 'de' organizational unit. The right pane shows the details for this entry in a table format.

attribute type	value
cn	Roland Stumpf
objectclass	person
objectclass	organizationalPerson
objectclass	ibmPerson
objectclass	ePerson
objectclass	top
sn	Stumpf
uid	001240724
alternatenode	DEVM
alternateuserid	RSTUMPF
buildingName	06
c	de
callupname	Stumpf, Roland
co	Germany
coreDataIntegrity	Y
dept	3229
directoryalias	GERMSUED
div	EL
divdept	dept=3229,div=EL,ou=bluepages,o=ibm.com
emailaddress	STUMPF@de.ibm.com
employeeCountrycode	724
employeetype	P

Number of search results: 18

LDAP Servers (incomplete list)

- § **IBM Tivoli Directory Server**
- § **z/VM LDAP Server**
- § Microsoft Active Directory
- § OpenLDAP
- § Apache Directory Server
- § Apple Open Directory
- § CA Directory from CA, Inc.
(formerly eTrust Directory)
- § Fedora Directory Server (Red Hat
Directory Server)
- § MXMS, from Atos Origin
- § M-Vault, from Isode Limited
- § Novell eDirectory
- § OneLDAP
- § OpenDS
- § Oracle Internet Directory
- § Penrose - a Java-based Virtual
Directory Server.
- § Siemens DirX
- § SIDVault
- § Sun Java System Directory Server
- §
- § (And many more)

z/VSE V4.2 LDAP Signon Support



- § LDAP Signon Support sits **on top of** any existing Security Manager
 - It can be used with the Basic Security Manager (BSM)
 - As well as with an External Security Manager (ESM)

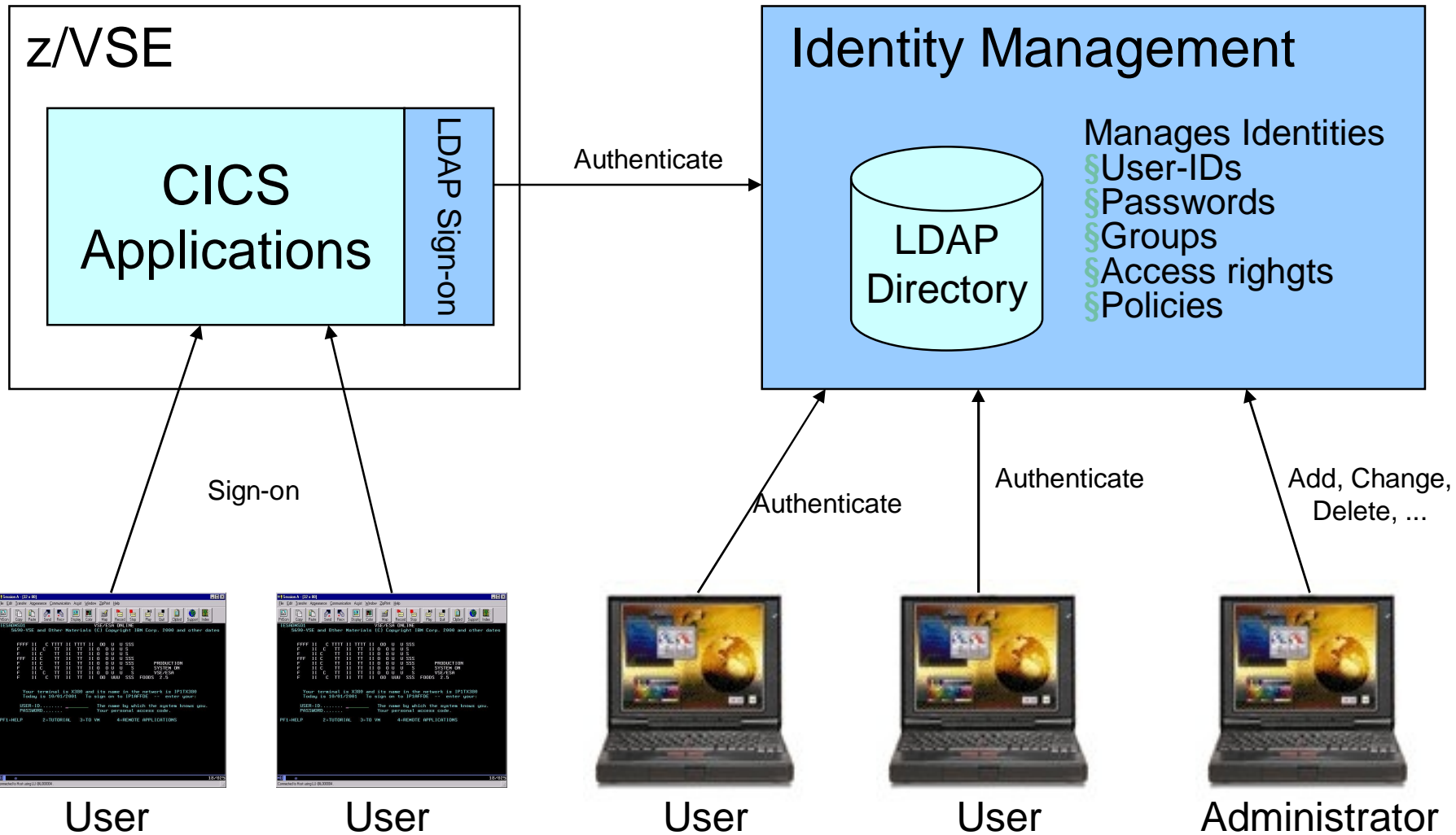
- § Signon process (simplified):
 1. It first **authenticates** an user against a **remote LDAP server**
 - Via LDAP Bind and Search operations
 2. Then it **maps the LDAP user** to a short VSE user
 - Using a LDAP User Mapping File
 3. Finally passes the short VSE user and password to the **existing signon process** (BSM or ESM)

- § Currently only available for CICS signon

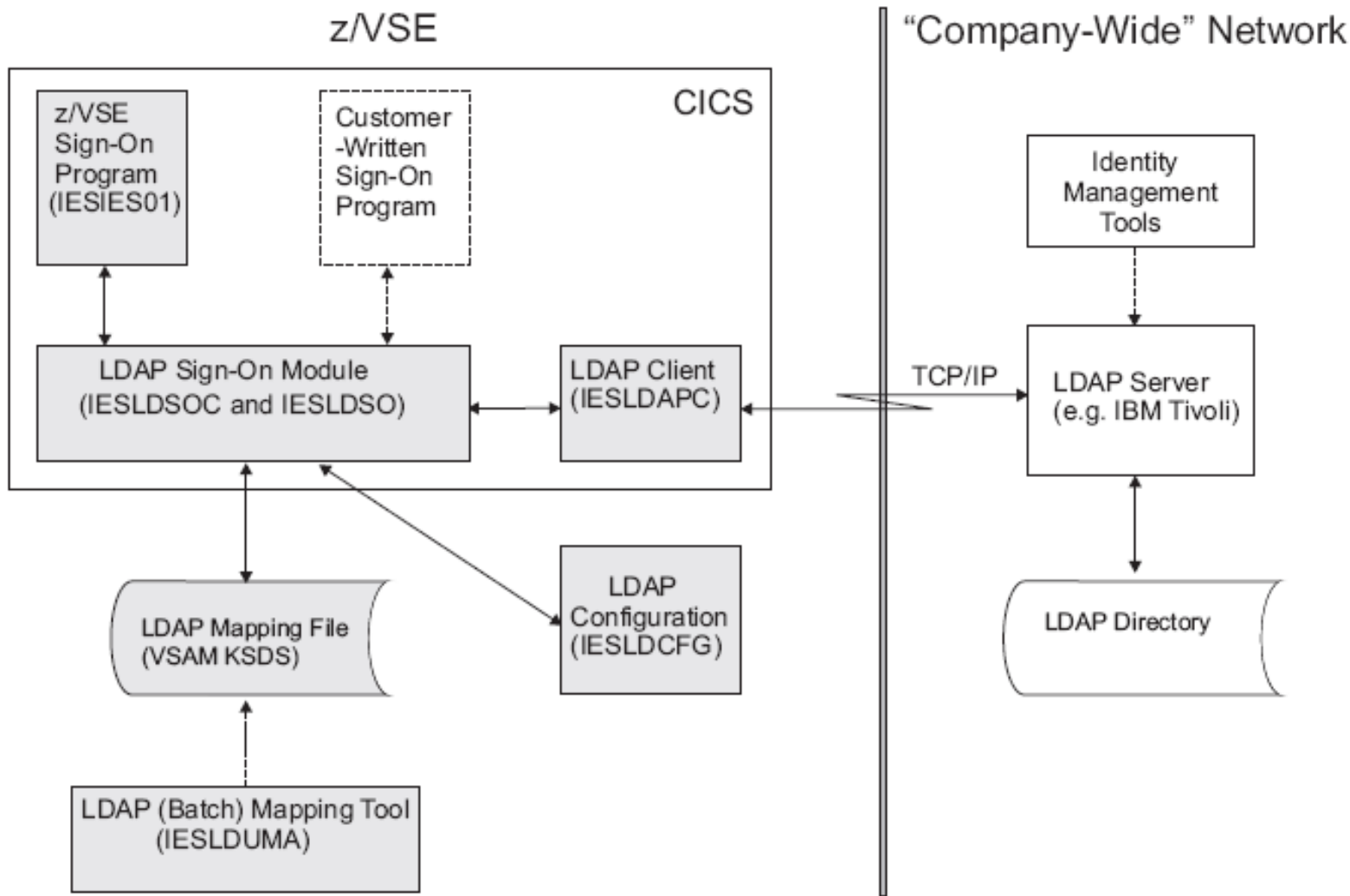
z/VSE V4.2 LDAP Signon Support

- § Enables users to sign on z/VSE using a **single, comprehensive, corporate-wide 'Identity Management' systems** (i.e. IBM Tivoli Identity Manager, etc.)
- § LDAP user-IDs and passwords can be **up to 64 characters**. Helps overcome VSE internal limits:
 - 4 character VSE/ICCF user-IDs
 - 4 and 8 character CICS user-IDs
 - up to 8 character Passwords
- § LDAP sign on sits on top of existing z/VSE security manager (i.e. BSM, ESM, etc.)
- § z/VSE LDAP client can work with common LDAP servers
 - IBM Tivoli Directory server
 - z/VM LDAP server (with optional RACF repository)
 - Microsoft Active Directory, OpenLDAP, Apache Directory server, Novell eDirectory, and many others.
- § Potential benefits include improved protection, **consistent access rules**, ease of use for end-users

The big picture

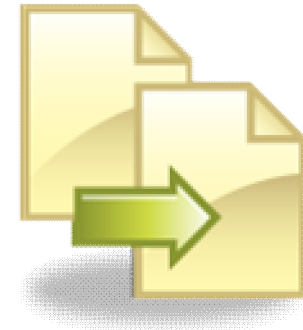


z/VSE V4.2 LDAP Signon Support



LDAP User Mapping File

- § VSAM KSDS file used to store the user-ID mappings
 - LDAP Users & Passwords: up to 64 characters
 - VSE Users & Passwords: up to 8 characters



- § The LDAP mapping file contains:
 - Records containing user-IDs that are to be **used for LDAP-authentication**
 - Contain a mapping of a long-user-ID (used in the LDAP environment) to a short-user-ID (used in z/VSE)
 - These user-IDs are referred to as being LDAP-enabled.
 - Records containing user-IDs that are **not used for LDAP-authentication** (for example, the SYSA user-ID)
 - These user-IDs are referred to as being not LDAP-enabled, and these users can sign on to z/VSE even if the LDAP server is not operational.

§ Maintained using batch tool IESLDUMA

LDAP Password cache

- § Authentication against a remote LDAP server **can be time consuming** (requires network communication)
- § When a user signs on multiple times within a short period of time, it is very unlikely that the LDAP password has changed
- § **If caching is enabled**, a shortpath is used to authenticate a user
 - A **password hash** (SHA-256) of the last successful signon attempt (LDAP bind) **is stored in the User Mapping File**
 - There is no way to recover the password from a hash
 - A subsequent signon request builds the password hash, and **compares the hash against the stored hash**
 - If it is the same, the user has entered the same password
 - A stored password hash has an **expiration period**. When it is over, a full LDAP signon (LDAP bind) is enforced

LDAP Configuration



- § Per default, LDAP signon is not enabled.
- § You need to **create a configuration** to enable LDAP signon support
 - Use Skeleton **SKLDCFG in ICCF library 59**
- § Specifies (summary)
 - DLBL Name of LDAP User Mapping File (default: IESLDUM)
 - IPs or hostnames of one or multiple LDAP Servers
 - Settings for Authentication method (see next foils)
 - Settings for Cache usage and expiration
 - Settings for Secure Socket Layer (SSL)

LDAP Authentication Methods

§ LDAP Authentication relies on the LDAP bind operation with distinguished name (DN) and password

§ **Direct Authentication:**

- The specified user-ID is used directly for the LDAP bind operation.
- A pattern is used to build the distinguished name for the bind, e.g. „cn=%u,dc=ibm,dc=com“

§ **Search Authentication:**

- In case the specified user-ID cannot be used directly for bind.
- Instead, a LDAP search operation is performed first using the attribute that is specified in the configuration (e.g. „email“).
- An additional search filter can be specified to further limit the search result, e.g. „dept=3229“
- The search result's distinguished name is then used for the LDAP bind operation.

Restrictions

- § No support for using long-user-IDs in the ID statement within batch jobs
 - ID statements can only use a short-user-ID and short-password (a “z/VSE” user-ID and password).

- § LDAP sign-on is only possible using a CICS sign-on panel.
 - The z/VSE-provided LDAP sign-on panel (IUI signon)
 - A customer-written sign-on panel.

- § Only LDAP Authentication (using Bind) is supported
 - Kerberos authentication (often used by MS Active Directory) is not supported



Using your own CICS Sign-on program

§ The Interactive Interface signon program (IESIES01) has been adapted to support LDAP authentication

- If LDAP authentication is configured and enabled, it will automatically show longer fields for userid and password



§ If you use your own sign-on program, you need to adapt it to use LDAP sign-on support:

- Enlarge fields in screen (BMS map) for userid and password
- Support case sensitive input
- Call LDAP Sign-on Program IESLDSOC to perform LDAP authentication

- Using EXEC CICS LINK with COMMAREA (see Admin Guide)
- Sample CICS Sign-on Program supporting LDAP is available on request (zvse@de.ibm.com)

LDAP Tools and Documentation



§ LDAP Browser

- JXplorer (<http://www.jxplorer.org/>)

§ z/VSE Manuals:

- Planning:** Subchapter in chapter 18. Security and Encryption Support: LDAP Sign-On Support
- Administration:** Chapter 45. Maintaining User Profiles in an LDAP Environment

§ Internet:

- Wikipedia:
http://en.wikipedia.org/wiki/Lightweight_Directory_Access_Protocol

Questions ?

