

# Directory-Enabled R/3 - SAP Supports LDAP

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## Outline

- Introduction - Directory Service and LDAP
- Motivation for Directory-Enabled R/3
- What is „Directory-enabled R/3“ ?
- Example LDAP transaction *LDAPTest*
- LDAP Connector - customizing and administration
- LDAP Projects in R/3
- Summary

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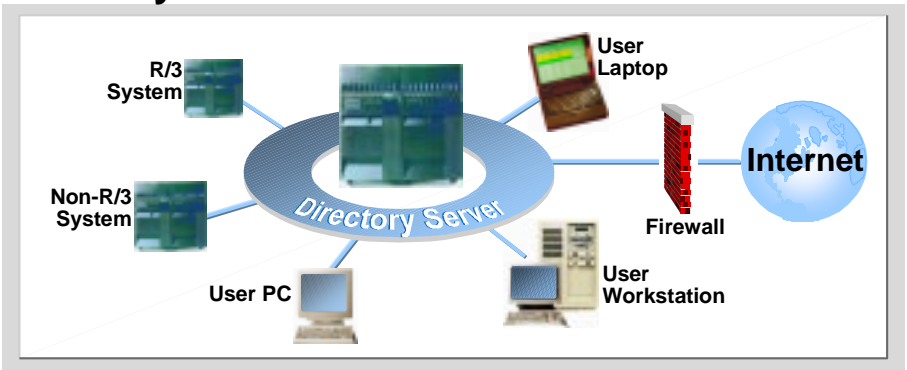
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## Directory Server = LDAP Server



- Directory Server is the **Address Book** in a computing network
- Directory Server contains information that is
  - shared between different applications and users
  - almost stable

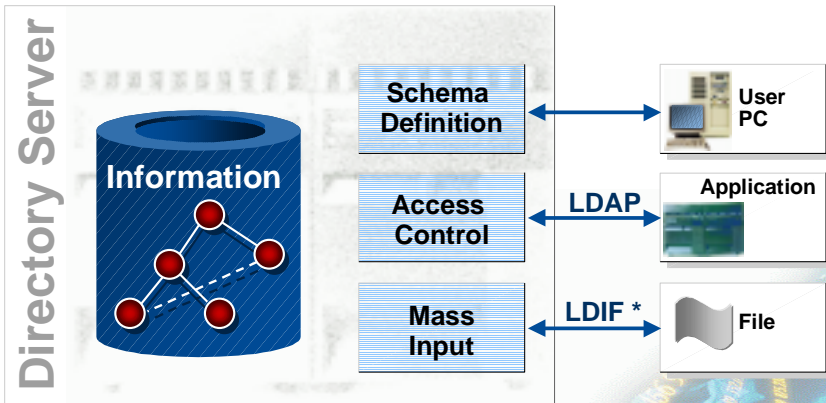


# Directory Server - History and Details

- Initial definition with X.500 Directory Server and X.500 Access Protocol DAP
- ⊕ Interesting approach to facilitate information sharing
- ⊖ Too costly to implement
- Throughput with LDAP and Internet / intranet capability



# Directory Server - Structure



\* LDIF - LDAP Data Interchange Format



# Directory Server - Schema Definition

```
objectclass top
  oid 2.5.6.0
  requires objectClass
           dn # distinguished name

objectclass person
  oid 2.5.6.6
  superior top
  requires
           sn, # surname
           cn # common name

  allows
           userPassword,
           telephoneNumber,
           seeAlso,
           description

objectclass sAPUser
  superior person
  requires
           sAPLogon
```

Schema describes which information is stored in the Directory Server

- Objectclass defines required and allowed attributes
- “Top” is rootclass, specialization by inheritance
- Classes can be assigned to an Object-ID
- Some classes are standard in every DS



# Three Major Types of Information in DS

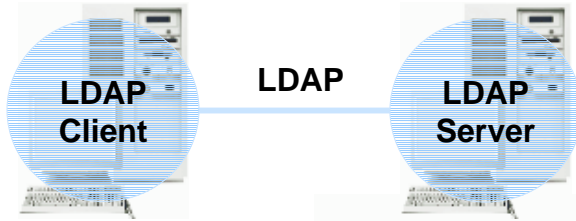
- Personnel information
  - Name
  - Department
  - Organization
  - ...
- User / Security information
  - User Account
  - Authorization
  - Certificates / Public Key
  - ...

- System resource and service information
  - System identifier
  - Application configuration
  - Printer configuration
  - ...

**Directory Server will play a significant role in next-generation IT environments!**



# LDAP - Lightweight Directory Access Protocol



- Protocol specifies how LDAP Clients communicate with LDAP Servers
- Standard protocol defined by IETF (Internet Engineering Task Force)
- Designed for the Internet (based on TCP/IP)



## LDAP Client

In addition to protocol, the IETF also standardized the LDAP Client-API

- ⊕ Same implementation on all platforms
- ⊕ Standard client functionality
- ⊕ Support for heterogeneous environments
- ⊕ Easy deployment in multi-application software environments



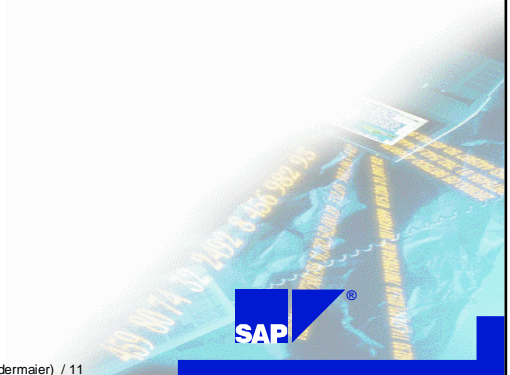
# Mission of LDAP

## LDAP is designed to

- Easily integrate directory services in arbitrary applications
- Based on the Internet technology

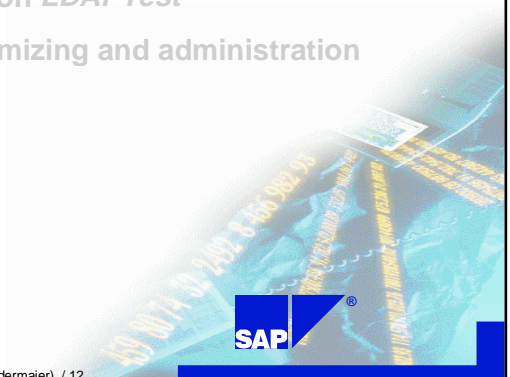
## Objective:

- Easy to implement
- Fast access
- Unique interface

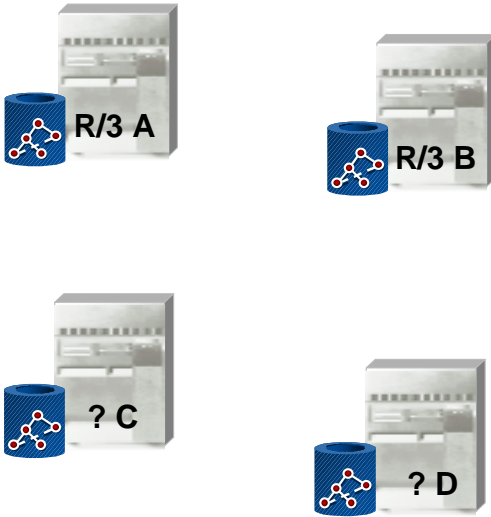


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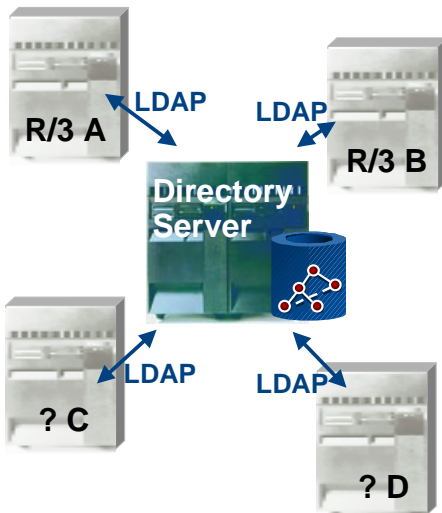
## Current Situation



- Every application - SAP and non-SAP - is its own information server
- ⊖ Redundant administration
- ⊖ Risk of inconsistency
- ⊖ Waste of storage
- ⊕ Fast, local access



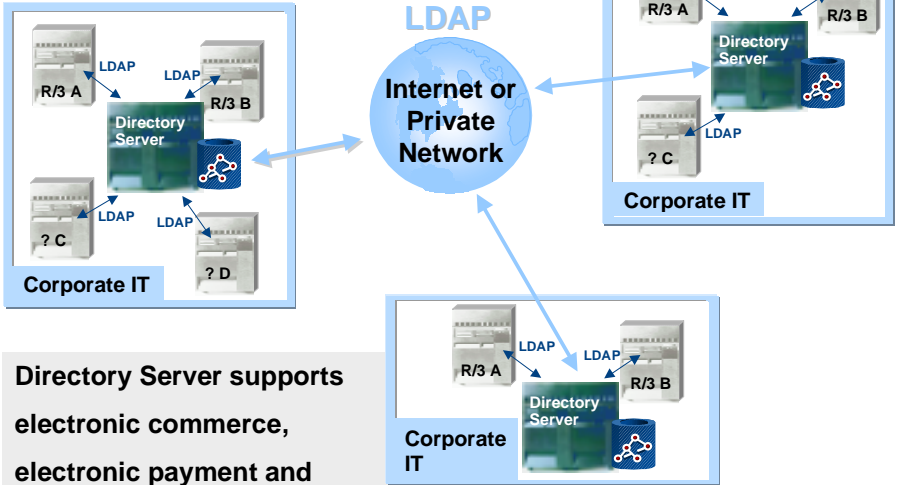
## Future Situation



- Directory Server is the information server in the corporate network
- ⊕ Central point of administration
- ⊕ No inconsistency
- ⊕ Easy information sharing
- ⊖ Remote access or caching



## Situation Longer-Term



Directory Server supports  
electronic commerce,  
electronic payment and

**Business-to-Business solutions**



## Benefit for SAP Customers

- Utilization of the advantages of an Directory Service within SAP implementation
- Reduced TCO (total cost of ownership) through single point of user and system resource administration
- Extended R/3 functionality
- Simplified integration of multiple SAP and non-SAP applications

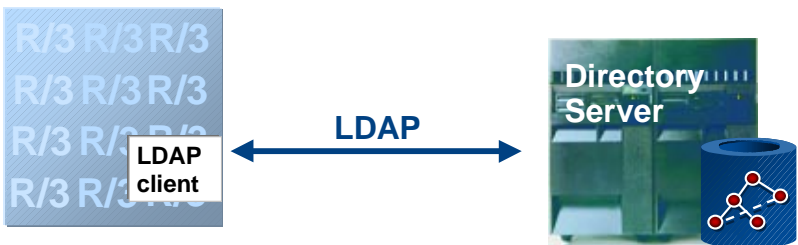


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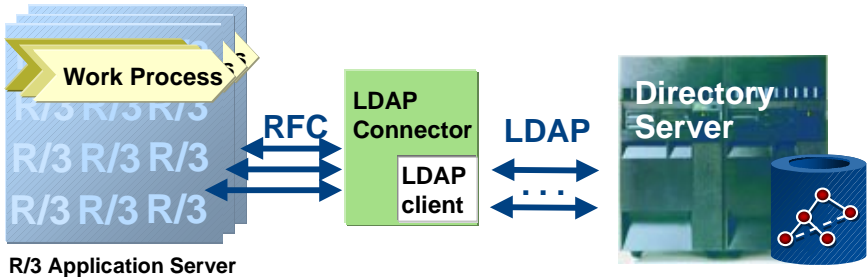
# Directory-Enabled R/3



- R/3 will become an **LDAP client**  
(currently no plans to make R/3 an LDAP Server)
- R/3 can **read** from and **write** to the LDAP-enabled Directory Server



## Configuration with Release 4.0 and 4.5

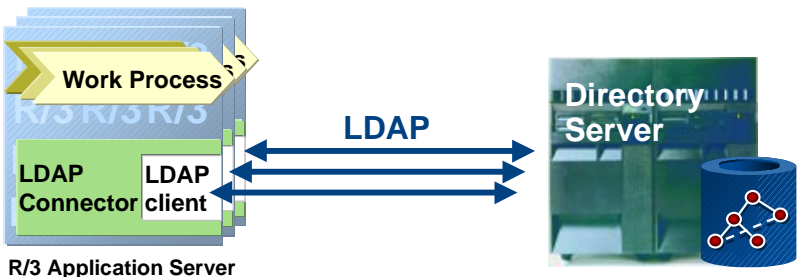


One LDAP Connector per R/3 Installation which contains the **LDAP client**  
(currently no plans to make R/3 an LDAP server)

- ⊕ Directory Server access through RFC connections
- ⊕ LDAP Connector runs on separate server - easy integration in running environment



## Configuration with Release 4.6 upwards

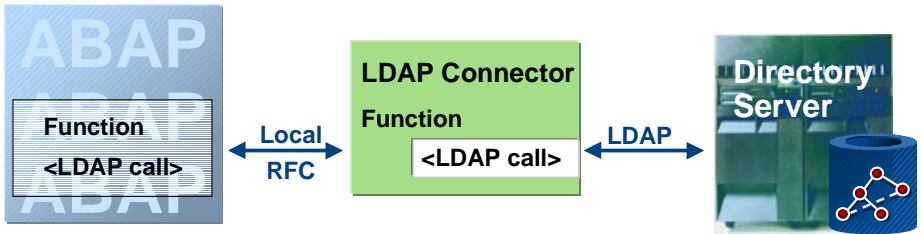


Every R/3 application server is an **LDAP client**  
(currently no plans to make R/3 an LDAP server)

- ⊕ Fast, direct access through local LDAP Connector
- ⊕ Easy control and administration through R/3 system administration tool (CCMS)



# Directory-Enabled R/3 - Software Architecture



- Easy access from R/3 application through ABAP LDAP Function Call
- “Local RFC” for fast access

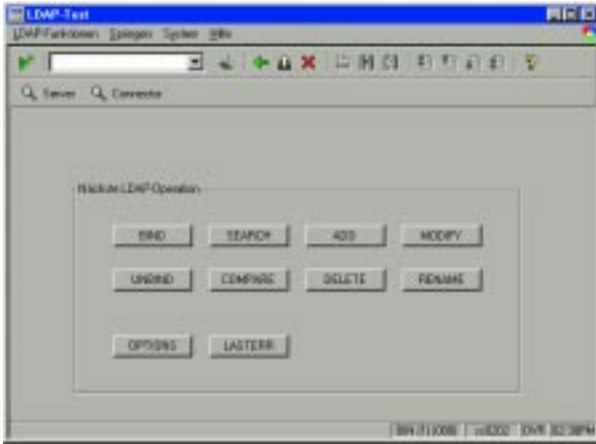


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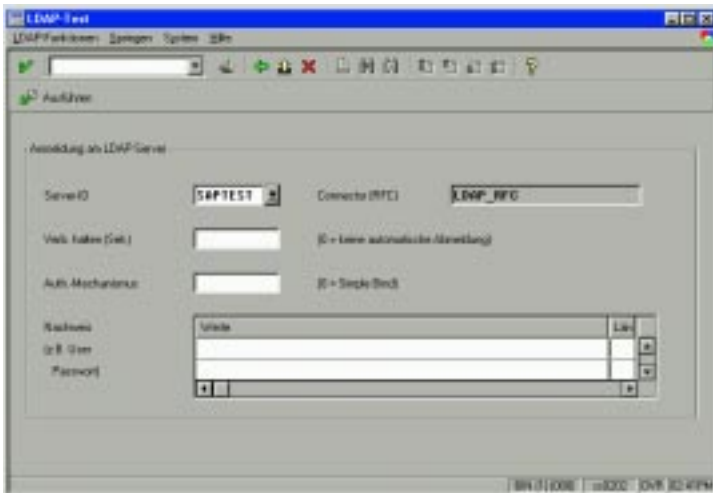
# LDAP Demo Transaction - Entry Screen



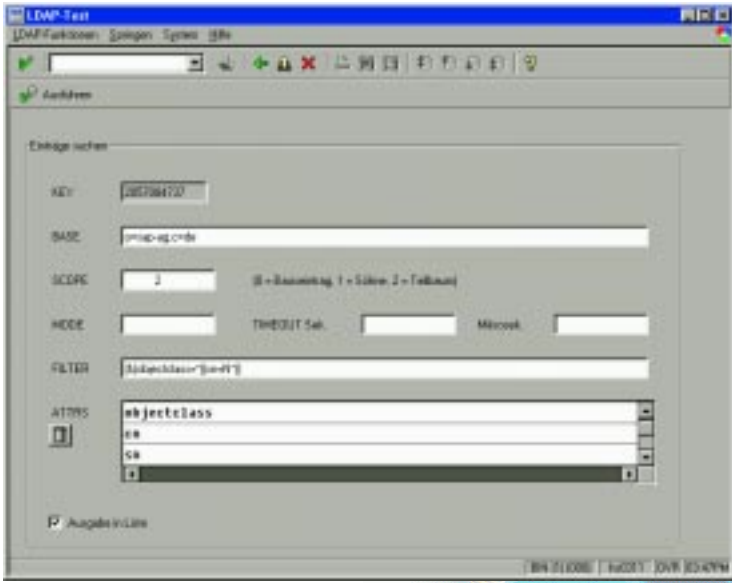
- Test transaction with all relevant LDAP calls



# LDAP Demo Transaction - Bind Operation

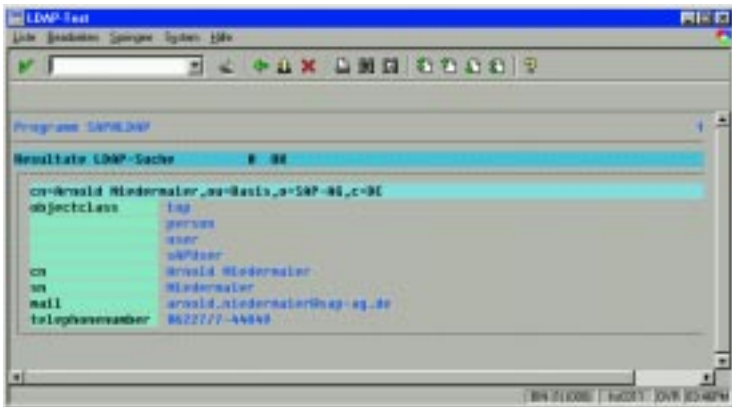


# LDAP Demo Transaction - Search Screen



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# LDAP Demo Transaction - Search Result



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## LDAP Demo Transaction - Implementation (1)

```
module user_command_0220 input.  
  if okcode eq 'NEXT'.  
    * prepare table attrs_io  
    * clear output tables dns_out, vals_out  
    call function 'LDAP_SEARCH'  
  
    exporting  
      base = base  
      scope = scope  
      mode = mode  
      filter = filter  
  
    tables  
      dns_out = dns_out  
      attrs_io = attrs_io  
      values_out = vals_out
```

The example shows how function call „LDAP\_SEARCH“ is implemented.

To be continued on next slide

## LDAP Demo Transaction - Implementation (2)

```
exceptions  
  conn_outdate = 1  
  ldap_failure = 2  
  other_error = 3  
  no_authoriz = 4  
  communication_failure = 7  
  system_failure = 8  
  others = 9.  
* Search results are now in tables dns_out, attrs_io and values_out.  
endif.  
endmodule.
```

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## LDAP Connector - Customizing and Administration

- **Table „LDAPServer“**

| MDT | ServerID | LDAP-Server     | Basis-DN of the entries         |
|-----|----------|-----------------|---------------------------------|
| 000 | ACTDIR   | p0815.sap-ag.de | cn=Users,dc=nt5,dc=sap-ag,dc=de |
| 000 | NETSCAPE | p0816.sap-ag.de | o=sap-ag,c=de                   |
| 000 | SAPTEST  | p007.sap-ag.de  | o=sap-ag,c=de                   |
| 000 | SUN_DS   | p4711.sap-ag.de | ou=People,dc=sapdomain2         |

- **LDAP Authorization Object**
  - New authorization object to control Directory Server access
- **LDAP Connector Administration**
  - Profile parameter to mark application server as LDAP-enabled



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# LDAP Projects in R/3 - Overview

- **Active Directory Integration (NT 5.0)**
- **Certificate management with R/3-Logon via ITS**
- **External R/3 user management**  
(domain user ↔ R/3 user ↔ role ↔ ...)
- **External R/3 Message Server management**
- **SAPlogon tool with LDAP interface**
- **Central address management**
- **Central organizational management**

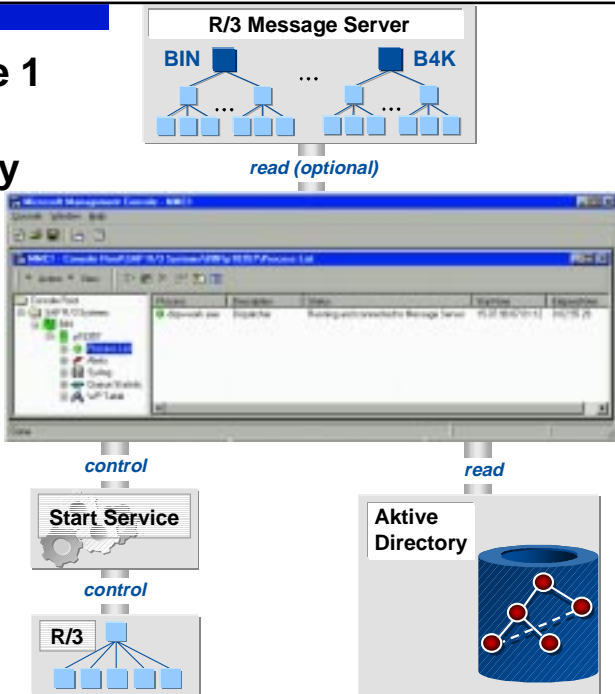
# Example 1 - Active Directory Application

- NT 5.0 Active Directory will contain information about all available R/3 application servers
- New SAP Start Service with SAP-specific DCOM Interface “ISAPControl” and MMC\* Snap-in “SAPmmc.dll” as graphical front end.
- The MMC\* Snap-in shows **status** and **parameter** of all application servers named in the Active Directory (▶ see next slide)

\* Microsoft Management Console



## Example 1 Active Directory



## Example 2 - Certificate Management with R/3-Logon via ITS

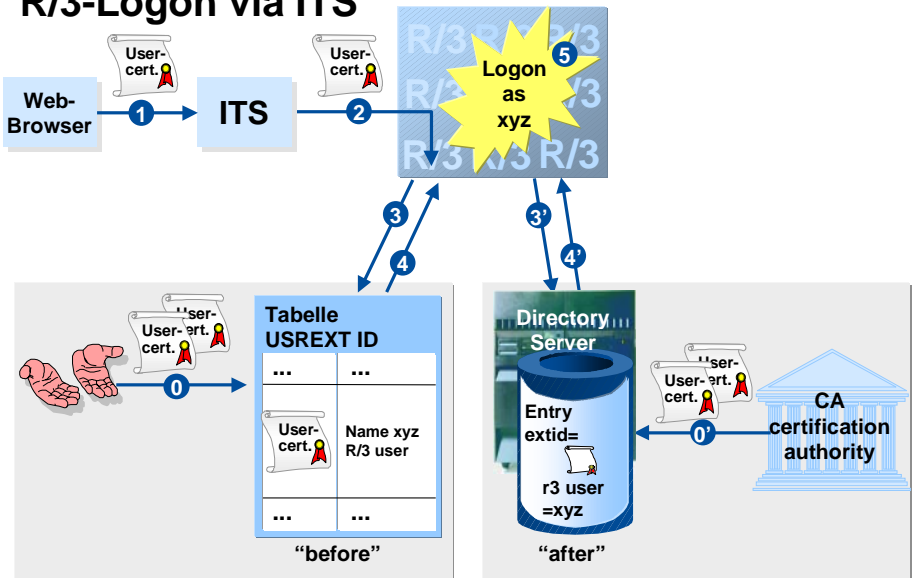
- R/3 system Authentication via ITS (Internet Transaction Server) using X.509 certificates
- Current implementation: Internal R/3 table with mapping of certificate and R/3 user
- Future implementation: Managing the certificates in central Directory Server



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## Example 2 - Certificate Management with R/3-Logon via ITS



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# Summary

- LDAP-enabled R/3 provides LDAP access from ABAP
- Every R/3 application server becomes an LDAP client
- Implementation based on **open standard protocols**
- LDAP-enabled R/3 opens new dimensions to
  - Better integration with non-SAP applications
  - Easy information sharing
  - Central place of administration for user and system data
- More and more SAP applications will use Directory Service to facilitate **corporate wide applications and global business processes**
- Future SAP systems will include Directory Server

