

SNUG Q2 – 29 May 2008

Accessing an LDAP Data Source using SAS

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Topics

- **Who is American Express**
- **Data Warehouse Architecture**
- **What is LDAP, what is it used for and why?**
- **Accessing LDAP using SAS**
- **Key Business Benefits**
- **Questions?**

Who is American Express?



Travel Services Representative

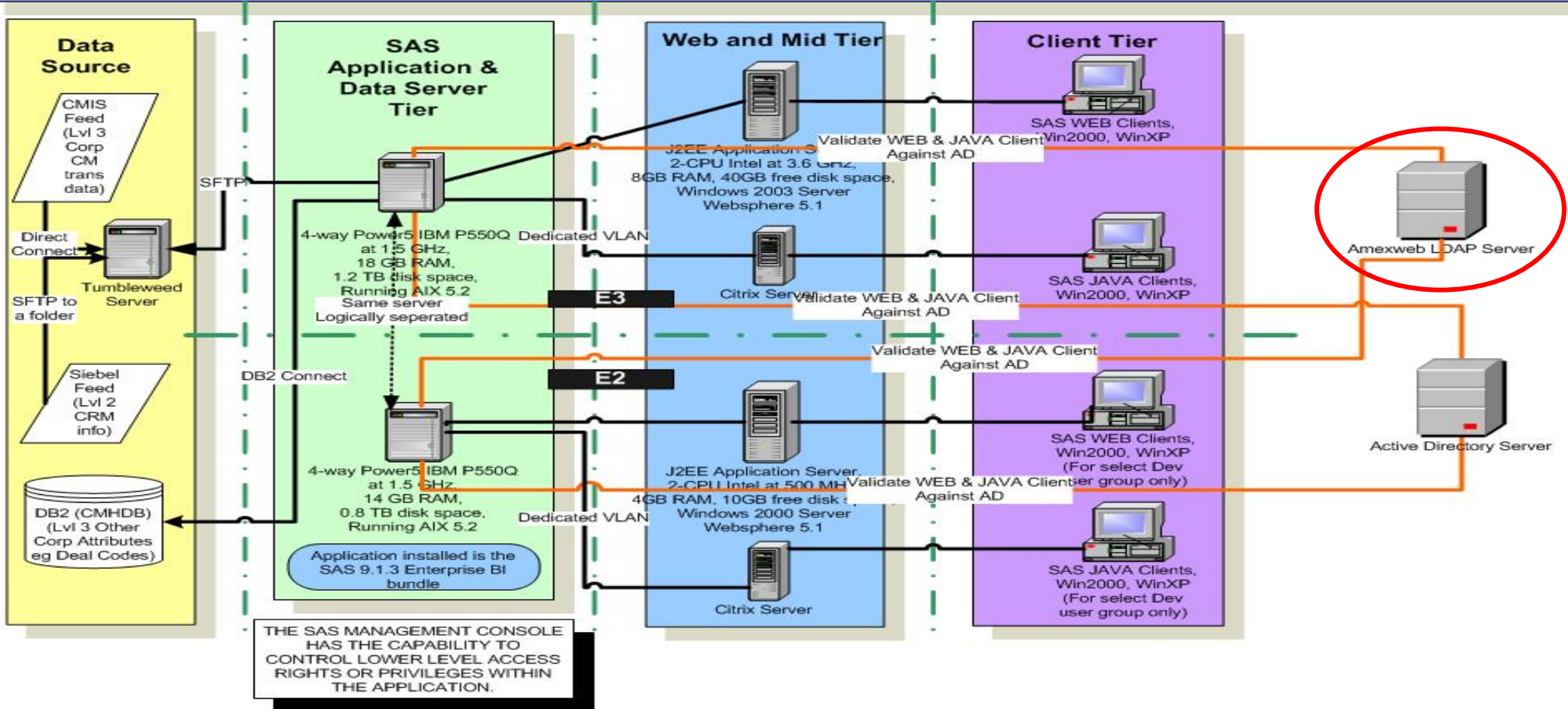


American Express History

- **1850 Established in New York as an express delivery business**
- **1891 World's first travellers cheque**
- **1958 First Amex credit card issued on purple paper**
- **Today operates in more than 130 countries**
- **75,000 Employees**
- **2007 card member spending reached US\$647 billion from 86 million cards**
- **Personal cards**
- **Company cards**
- **Travel**
- **Merchants**

Data Warehouse Architecture

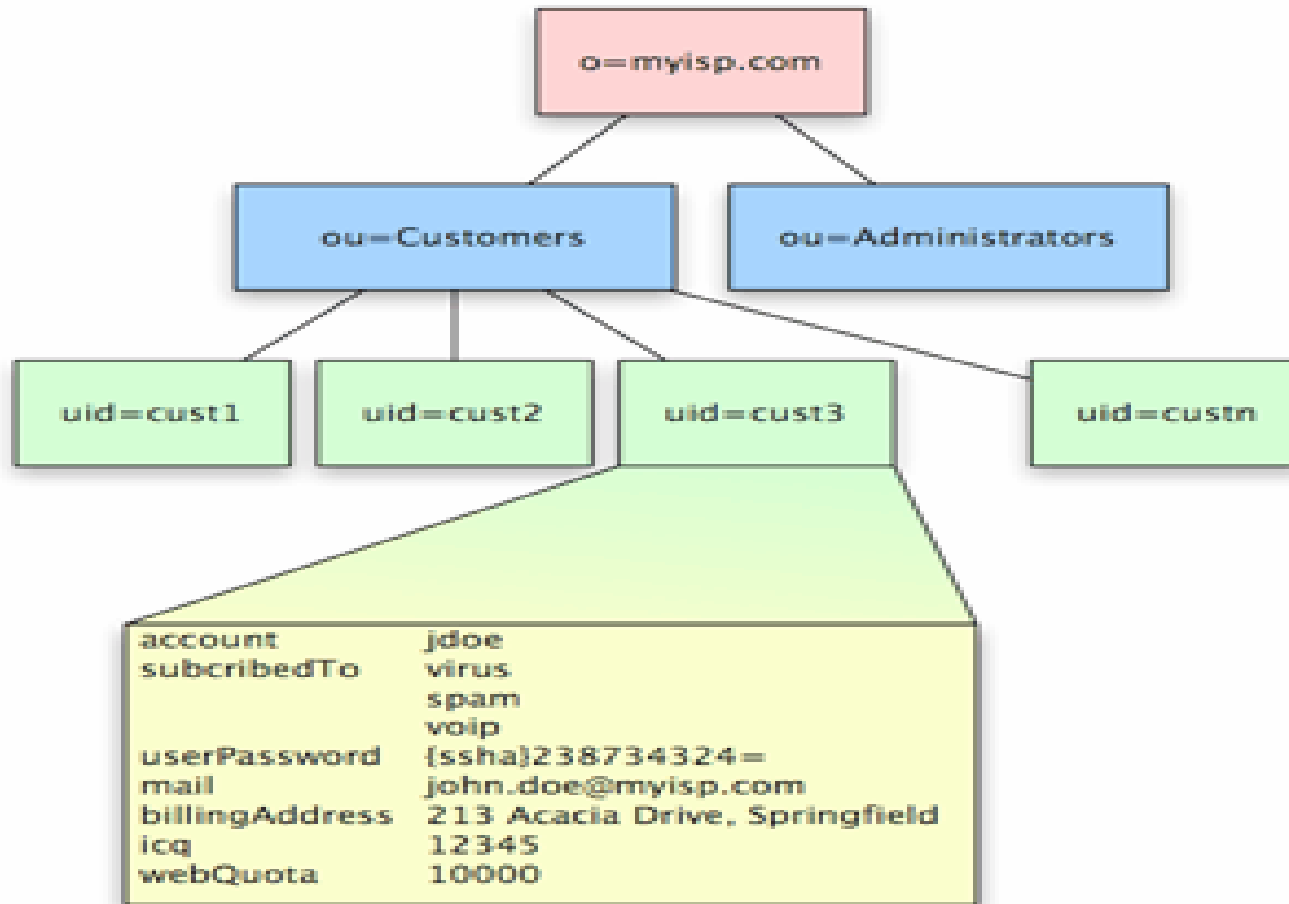
Physical Architecture AMEX



What is LDAP, what is it used for and why?

- **Lightweight Directory Access Protocol**
- **Application Protocol for Querying and Modifying Directory services**
- **Hierarchical with directories arranged in a “TREE”**
- **Used for persons or organisations e.g. Human Resources, ISP**
- **Used for authentication e.g. Active Directory**
- **Each entry has a set of attributes e.g. phone no or email address**
- **Each attribute has a value or set of values**

Used to hold Account Information e.g. for an ISP



Accessing LDAP Using SAS

- **Part of Integration Technologies not Base SAS**
- **LDAP CALL Routine Interface**
- **This is how we can search an LDAP server**
- **Uses a series of data step call routines**
 - ✦ **LDAPS_OPEN**
 - ✦ **LDAPS_SEARCH**
 - ✦ **LDAPS_ENTRY**
 - ✦ **LDAPS_ATTRNAME**
 - ✦ **LDAPS_ATTRVALUE**
 - ✦ **LDAPS_CLOSE**

LDAPS_OPEN

```
options VALIDVARNAME=V7;

data _dir_lookup;

    set _input_ds end=last;

if _n_ = 1 then do;

    /* ***** */
    /* Open Connection to LDAP Server */
    /* ***** */

        call ldaps_open(handle,                               /* connection handle */
                        "ldap.server.aexp.com",              /*server name */
                        "123",                               /* port no */
                        "ou=people,o=aexp",                 /* base object for search */
                        "rodney",                           /* name to bind to server */
                        "blah",                             /* bind password */
                        rc);                                /* return code */

end;
```

LDAPS_SEARCH

```
filter = "(axppmanagerid=||strip(employee_id)||)";
```

```
/* ***** */
```

```
/* Search on manager id */
```

```
/* ***** */
```

```
call ldaps_search(handle,           /*connection handle */  
                  shandle,         /* search handle */  
                  filter,          /* filter string */  
                  "",              /* attributes to return */  
                  numEntries,      /*number of entries found */  
                  rc);            /* return code */
```

LDAPS_ENTRY, LDAPS_ATTRNAME, LDAPS_ATTRVALUE

```
do j=1 to numEntries;

    /* Lookup available attributes */
    call ldaps_entry(shandle, j, entryname, numAttrs, rc);

    /* Loop around all available attributes extracting values */
    do i = 1 to numAttrs;
        /* Get name of current attribute */
        call ldaps_attrName(shandle, j, i, attrName, numValues, rc);
        /* Get value of current attribute */
        call ldaps_attrValue(shandle, j, i, 1, value, rc);

        output;          /* Output current entry */
    end;
end;
```

Attribute names and values

	entryName	attrName	value
1	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	axppmanager	Bloggs, Joe
2	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	axppjobcode	040331
3	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	axppcc_descr	GCC JAPA FS&E Sales Reportin
4	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	telephoneNumber	9271 4272
5	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	axppcc-cd	072 711 022
6	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	axppstartdate	2007-05-14
7	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	axppband	30
8	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	mail	Rodney.Marwick@aexp.com
9	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	uid	marwick123
10	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	axppguid	8b230ecc729be600f317c94960a
11	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	cn	Rodney Marwick
12	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	axppmanagerid	6123456
13	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	employeeNumber	9765432
14	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	l	Sydney
15	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	axpppersonotype	E
16	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	c	AUS
17	axppehash=474cb3de293073541bc4eb8c744da02b48233251,ou=people,o=aexp	axppregisteredname	Marwick,Rodney

LDAPS_CLOSE

```
if last then do;  
    /* close connection to LDAP server */  
    call ldaps_close(handle,rc);  
end;  
  
/* transpose to get one line per logical record */  
proc transpose data = _dir_lookup  
    out = _dir_lookup_trans(drop=_name_ entryName);  
    by entryName NOTSORTED;  
    id attrName;  
    var value;  
  
run;
```

Key Business Benefits

- **Automatically Create, Modify or Delete Users in Metadata (using data step functions or Proc Metadata)**
- **Automatically Create User Groups based on cost centre name in Metadata**
- **Automatically Creates Custom Groups**
- **These Groups can then be assigned to security groups in SMC**
- **Create Organisation hierarchy dimension table to feed into data model**
- **Used in Proc Olap (star schema), building cubes, Web Report Studio etc**

References

Questions?

- http://support.sas.com/rnd/itech/doc9/dev_guide/ldap/ldapintf/index.html
- <http://www.gracion.com/server/whatldap.html>
- <http://www.isode.com/whitepapers/ldap-for-isps.html>
- **Andrew Purser (independent SAS consultant)**