



# Publish and Subscribe “Provisioning” Interfaces

# Agenda



- Interface Objectives
- Requirements
- Interface Alternatives Pros and Cons
- Design Principles
- Architecture and Connectors
- Connector Design Specifications
- Project Management and Subcontracting
- Conclusions

# Interface Objectives



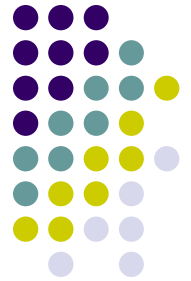
- The goal of this presentation is to:
  - Explain **key requirements** that go into choosing an interface technology.
  - Describe the **Publish and Subscribe** “provisioning” model.
  - Review **project management challenges** for sub-contracting interface connector development.

# Background



- 2004 project to **upgrade on-line billing** facility
- Objective was to provide **more self-serve functions** less reliance on customer service representatives.
- **Interface front end web with package** for on-line billing and SAP/Customer Care System
- Needed interface architecture that would tie all systems together and **not impede performance**

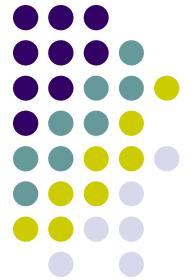
# Requirements



- Changes are **reflected in all systems** that use the data.
- Interfaces are **available and reliable**.
- Data is updated in a timely manner.
- Changes should be **correct on all subscribing systems**.
- **Publish once** with many subscribers.
- **Persistent storage** of interface data.

# Interface Alternatives

## Pros and Cons



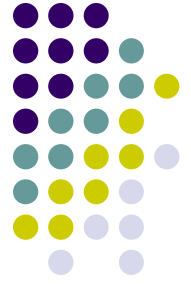
Architectural Approach	Pros and Cons
Java Messaging Service	<ul style="list-style-type: none"><li>■ Low Level Solution</li><li>■ Publish to a message queue</li><li>■ Subscribing Agent listens for a particular type of message</li><li>■ Writes message via API</li><li>■ Not handled</li><li>■ Transaction integrity, reliable delivery, rollback and error handled</li></ul>
Enterprise Application Interface	<ul style="list-style-type: none"><li>■ Separates publisher from subscriber</li><li>■ Messages are turned over to the message service</li><li>■ Subscriber apps can query publisher DBs</li><li>■ Guarantees delivery of the message</li></ul>

# Interface Alternatives



Architectural Approach	Pros and Cons
Provisioning	<ul style="list-style-type: none"><li>■ Step up over EAI</li><li>■ Guarantees delivery</li><li>■ Provides its own storage and Audit logging</li><li>■ Provision driven from event logs</li><li>■ Persistent storage</li><li>■ In format in connectors is controlled by style sheets</li></ul>
WebServices	<ul style="list-style-type: none"><li>■ Published API</li><li>■ Similar in characteristics to JMS solution</li></ul>
Enterprise Service Bus (ESBs)	<ul style="list-style-type: none"><li>■ Interfacing is done by mapping data</li></ul>

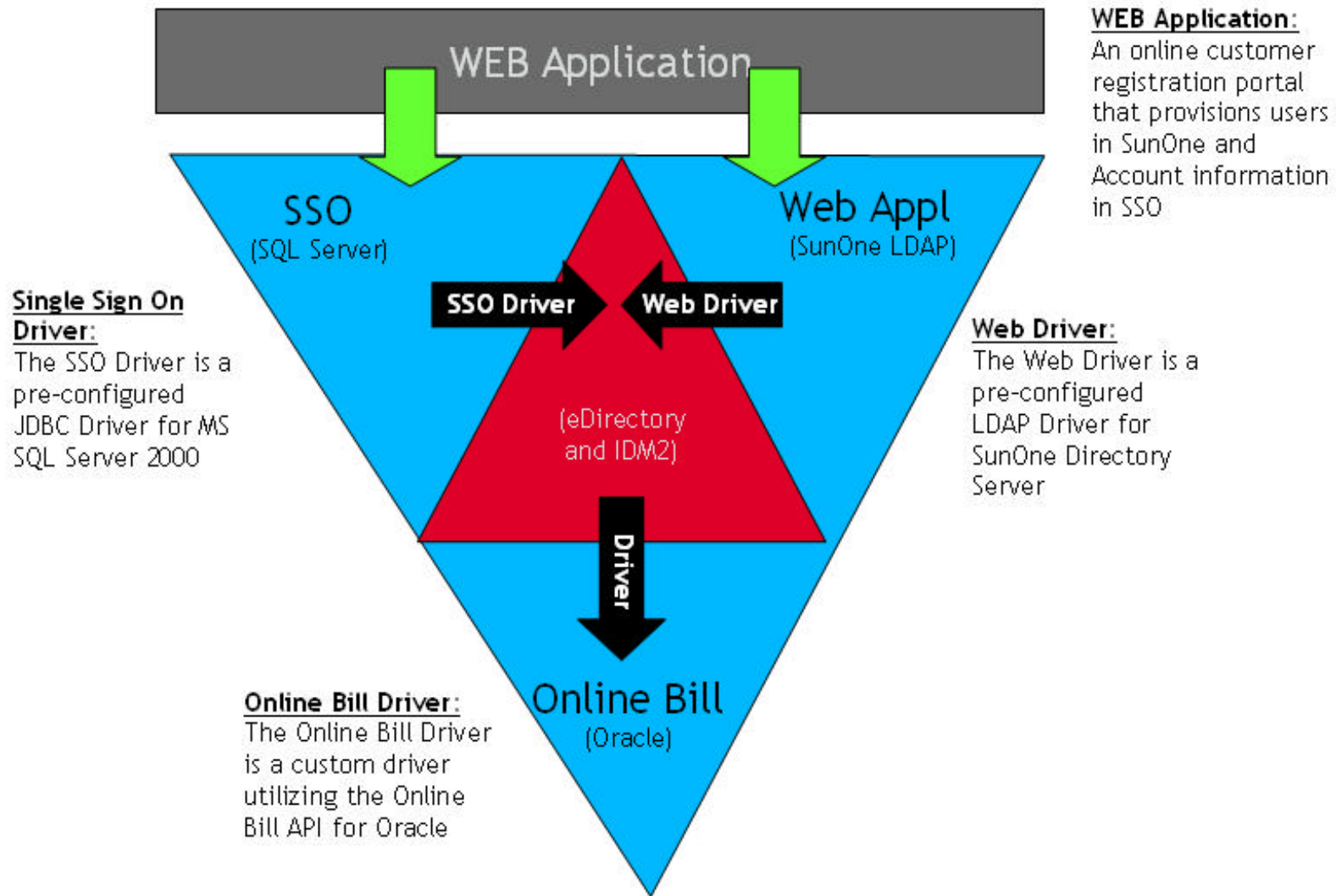
# Design Principles



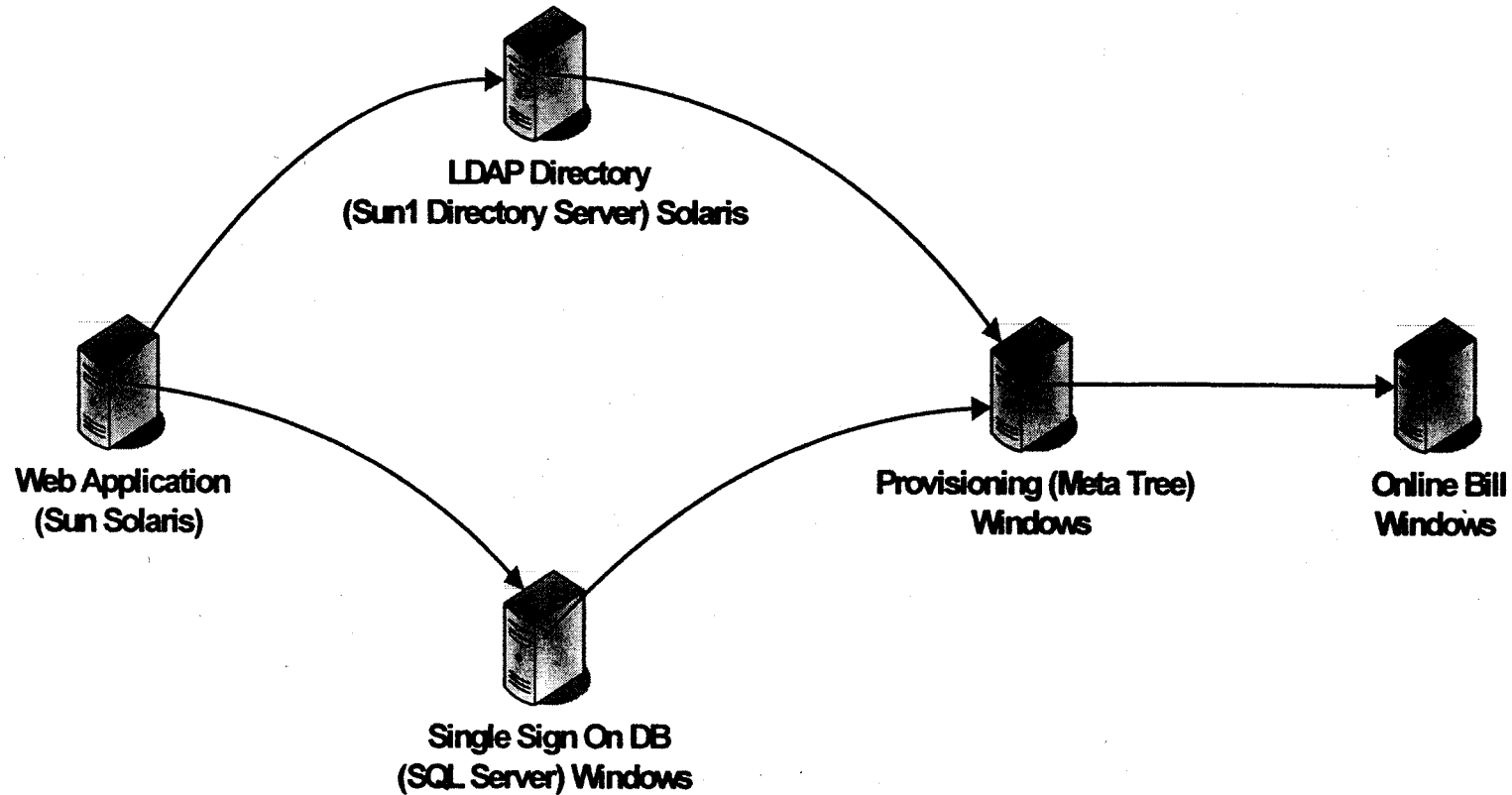
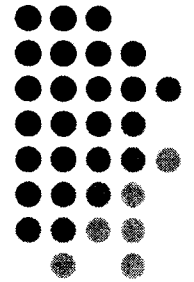
- Separation of Data:
  - Keep identity information in the directory
  - Put Profile information in the Database
  - Keep Application data with the application
- Applications are responsible for collecting data from subscribers
- Applications must be fault tolerant
  - Handle race conditions
  - Connectors are self correcting
- Reconcile provisioning errors



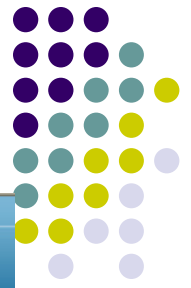
# Provisioning Logical Architecture



# Provisioning Physical Architecture



# Connector Configuration



**iManager**  
ADMIN  
EMC-CPV-S

**Roles and Tasks**  
[All Categories]  
24/7  
Credential Provisioning  
Directory Administration  
eDirectory Maintenance  
Fan-Out Driver Configuration  
Fan-Out Driver Utilities  
Groups  
Help Desk  
Identity Manager  
**Identity Manager Overview**  
Object Inspector  
Driver Cache Inspector  
Driver Inspector  
Identity Manager Utilities  
Novell Certificate Access  
Novell Certificate Server  
Partitions and Replicas  
Passwords  
PBX  
Provisioning Configuration

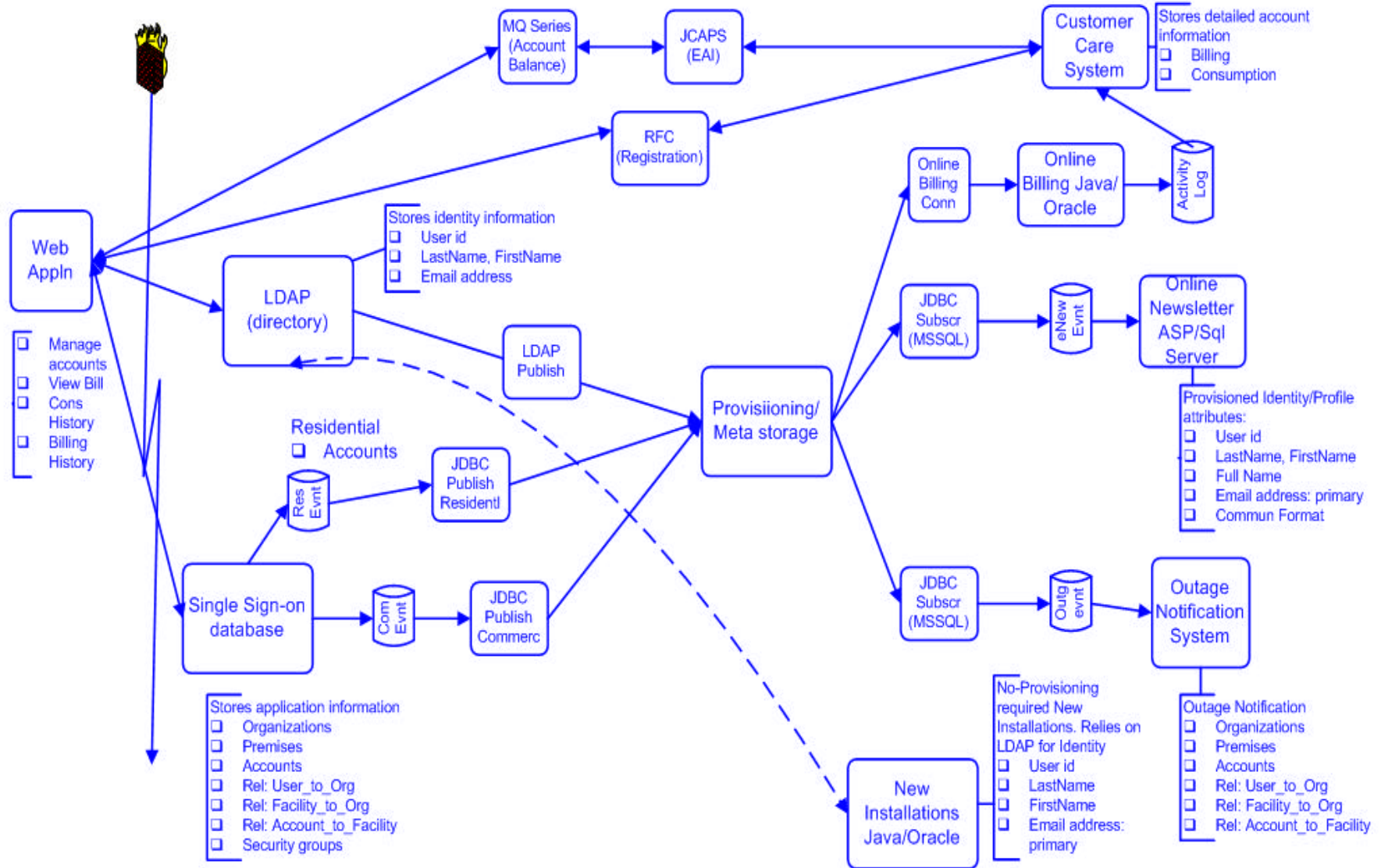
**Driver Set:** DriverSet.idm.services [Activation](#)

The diagram shows a central vertical bar labeled "Identity Vault" with a compass rose icon. It is connected to several drivers: two JDBC drivers (SSO Driver and eNews), an Online Acct Driver (Loopback), an EMC Driver (LDAP), two more JDBC drivers (SSO Commercial and ONUS), and a CCS driver (Loopback).

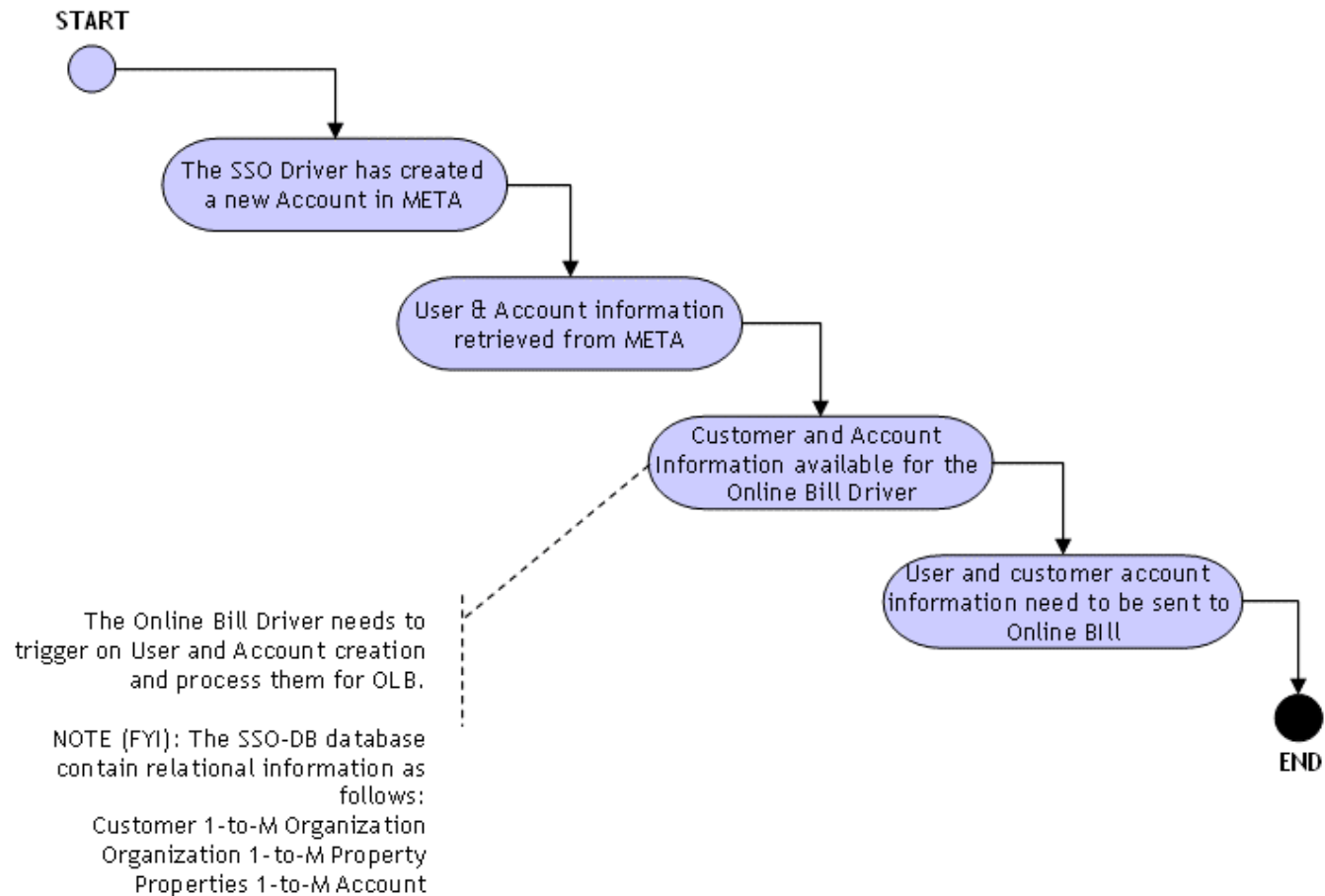
**Running on server(s):**  
▶ 1-NDS.services

**Buttons:**  
Add Driver  
Delete Driver  
Information

# Provisioning Information Flow



# Provisioning Connector Event Definitions: Online Bill



# Provisioning Connector Event Specifications



## Outage Notification Functionality Matrix – SSO Driver (Organization)

•Reference	•Description	•Direction	•Priority	•Comments
•1.0	•When a new organization is created in SSO, the organization needs to be created in META.	•Publisher	•High	•The attributes that need to be created (in organizations) are: org-name  •CN is organization_oid  •The schema will be extended to accommodate the bch related information in the META tree.
•2.0	•When an organization is modified in SSO, the respective organization information needs to be updated in META.	•Publisher	•High	•The attributes that need to be updated are: org-name, deleted-flag

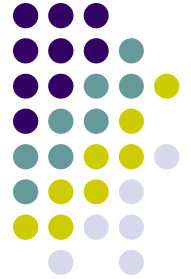
# Provisioning Connector Specification – Data Mapping



## Outage Notification Data Mapping – SSO Driver

•SSO Data Elements	•META Data Elements	•Comments
<ul style="list-style-type: none"> <li>•dirxml_org_view</li> <li>•organization_oid</li> <li>•name_tx</li> <li>•deleted_fl</li>   <li>•dirxml_fac_view</li> <li>•facility_oid</li> <li>•name_tx</li> <li>•deleted_fl</li>   <li>•dirxml_acct_view</li> <li>•account_oid</li> <li>•account_number_tx</li> <li>•deleted_fl</li> <li>•closed_fl</li> <li>•ccs_installation_id_tx (SLID)</li> <li>•ccs_account_type_cd</li> </ul>	<ul style="list-style-type: none"> <li>•organization</li> <li>•CN</li> <li>•org-name</li> <li>•deleted-flag</li>   <li>•facilities</li> <li>•CN</li> <li>•fac-name</li> <li>•deleted-flag</li>   <li>•sso-account</li> <li>•account-oid</li> <li>•CN</li> <li>•deleted-flag</li> <li>•closed-account-flag</li> <li>•acct-slid</li> <li>•ccs-account-type-cd</li> </ul>	<ul style="list-style-type: none"> <li>•Note that dirxml_org_view, dirxml_fac_view, and dirxml_acct_view are physical views in the SSO database and emc-organization, emc-facilities, and sso-account are schema extensions in META that extends the Group class in order to accommodate membership.</li> </ul>

# Provisioning Connector Logic



- . Add Account
- . Add Organization
- . Add Facility
- . Add Relationship (Group)
  - User to Organization
  - Facility to Organization
  - Account to Facility
- . Delete Account
- . Delete Organization
- . Delete Facility
- . Delete Relationship (Group)
- . Modify Account
- . Modify Organization
- . Modify Facility
- . Modify Relationship (Group)



# Application Design Considerations



Profile & Account

Home > Your Account

Andrew Hanna [Edit Profile]

Account No. 14535 Smart

Account Home Bill Consumption Payment History

home test9cPRDTEST1

Current Bill - Nov 2009 \$92.50

View PDF bill [12 Kb] ?

1 Payment Received \$92.50 CR

BALANCE Ways to Pay \$0.00

Billing Preferences

Bill Format: Online Bill + Paper Bill Turn off your paper bill ?

Equal Payment Plan: Set up ?

Pre-Authorized Payments: Set up ?

Consumption

Period: Jan 23, 2006 - Jan 19, 2007

Total Consumption: 1999 kWh

Daily Average: 34 kWh / day

View Consumption History

View Meter Reading

Adding account changes your view ?

+ Add Account

Edit Account

Subscriptions & Services

eNewsletters

Manage your email newsletter subscriptions. We have newsletters for both residential and business customers.

Get Connected

If you're building or renovating, place an online request to add, upgrade or remove an electrical service connection at your property.

Moving

If you're moving or closing an existing account, complete our online form.

Outage Resources

Find out where the current outages are located, learn how to prepare for outages, and more.

Applications



# Design Features and Challenges

- Separation of front end and back end systems
- Synchronization of Meta interface storage



- Application Registration collects application data
- Application Software handles race conditions
- Reconciliation of provisioning errors

# Project Management Subcontracting Connector Build



- Terms of Engagement
- Proof of concept
- All support staff pre-booked
- Designated Project Room (Control Centre)
- Knowledge Transfer: Consultants were shadowed
- Acceptance and Support
- Contractor feedback

# Conclusions



- Invest the time to understand the interface
- Engage most respected designers in decision.
- Engage vendors on proof of concept.
- Publish and subscribe model most suited for high volume
- Keeping Identity, Common and Application data separate is key to scalability
- Minimizes dependencies across interface architecture
- Provisioning errors will occur so do reconciliations