

...Out of the Garage

Christopher F. Burns, Sr. 

cburns@inuendo.us



@InuendoData



Inuendo.us

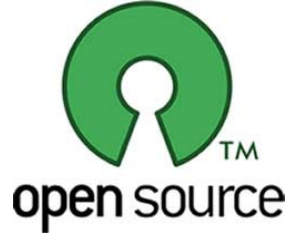




## Why are we here ?.....

RUNDOWN
Y ASK Y
SAM ADAMS
LAST TIME
STATI
GET IT UP
SOURCE
GOT THE FUNC
BLAME THE REF
57 STATES
CLASS WARFARE
MORE...

- To actually start using the Inuendo strategy instead of just learning about it.
- To develop an initial strategy from the prism points outward.
- To break monolithic record layouts into reusable pieces.
- To learn the fundamentals of real time synchronization and transaction synthesis.
- To build a solid foundation for future steps.
- Others ?



## On tap....

RUNDOWN
Y ASK Y
<b>SAM ADAMS</b>
LAST TIME
STATI
GET IT UP
SOURCE
GOT THE FUNC
BLAME THE REF
57 STATES
CLASS WARFARE
MORE...

- Quick recap of the Inuendo project.
  - Review download & installation.
  - Tour of the open source code.
- Our first crack at it.
  - Class/property maintenance.
  - Replication triggers.
  - Transaction synthesis.
- Next steps
- Q & A



...Out of the Garage

Quick recap

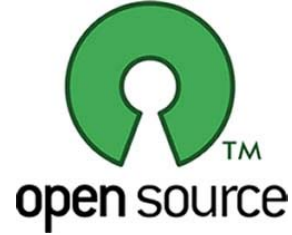




## Previously, on [*your sitcom here*].....

RUNDOWN
Y ASK Y
SAM ADAMS
LAST TIME
STATI
GET IT UP
SOURCE
GOT THE FUNC
BLAME THE REF
57 STATES
CLASS WARFARE
MORE...

- Inuendo is a strategy for virtualizing physical data into classes that represent entities in the supply chain.
  - OO design at the data level.
- All entities are created equal and subordinate to a parent entity.
  - The Founder is the highest possible parent.
  - Each entity has a header with unique ID and metadata.
- Data is organized by its type.
  - One property/value subtable for each type.
- Every change to every value of every property is historically captured in the subtables and time indexed.
- All data is created, updated and retrieved using centralized functions.
  - Retrieval functions may reflect a moment in time.



## Status of open source project..

- Became available April, 2012.
  - Updated twice annually for feature adds and various bug fixes.
- Download from GitHub
  - <https://github.com>
  - SAVF for installation.
  - Source code for forking, pull requests.
  - Installation guide, tech reference.
  - Legacy data re-engineering example.

RUNDOWN
Y ASK Y
SAM ADAMS
LAST TIME
STATI
GET IT UP
SOURCE
GOT THE FUNC
BLAME THE REF
57 STATES
CLASS WARFARE
MORE...

## INSTALLATION INSTRUCTIONS

Download the installation save file INUENDOINS.SAVF to your hard drive in an easy to reach directory, such as the root of C:

On your IBM i:

- Create a save file on your IBM i: CRTSAVF FILE(MYLIB/INUENDOINS)

From your desktop PC:

- Open the DOS command prompt
- FTP a.b.c.d <enter> (where a.b.c.d is the IP address of your IBM i)
- Enter user and password as prompted
- BIN <enter>
- PUT C:\INUENDOINS.SAVF MYLIB/INUENDOINS.SAVF <enter>
- QUIT <enter>

Back to your IBM i:

- Restore the installation objects to QTEMP: RSTOBJ OBJ(\*ALL) SAVLIB(INUENDOINS) DEV(\*SAVF) SAVF(MYLIB/INUENDOINS) MBROPT(\*ALL) ALWOBJDIF(\*ALL) RSTLIB(QTEMP)
- Ensure that QTEMP is in your library list: ADDLIB LIB(QTEMP)
- Enter the command INSINUDB and prompt with F4.

**Consistent with  
other IBM i  
downloads.**

Click to add notes



Install Inuendo Database (INSINUDB)

Type choices, press Enter.

Object Library . . . . .	_____	Name
Data Library . . . . .	_____	Name
Owner User Profile . . . . .	_____	Name
AES Encryption Passphrase . . . . .	_____	

---

Enable Journaling . . . . .	<u>*NO</u>	*NO, *YES
-----------------------------	------------	-----------

F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel    F13=How to use this display    Bottom  
F24=More keys



Work with Objects Using PDM

S06BA2CP

Library . . . . . JONESOBJ      Position to . . . . .  
Position to type . . . . .

Type options, press Enter.

- 2=Change      3=Copy
- 8=Display description      4=Delete      5=Display      7=Rename
- 9=Save      10=Restore      11=Move ...

Opt	Object	Type	Attribute	Text
—	QCLSRC	*FILE	PF-SRC	Control Language Source
—	QCMDSRC	*FILE	PF-SRC	Command Source
—	QCPYSRC	*FILE	PF-SRC	RPG Copy Source (Modern)
—	QDDSSRC	*FILE	PF-SRC	Data Description Specification Source
—	QMNUSRC	*FILE	PF-SRC	Menu Source
—	QRPGLESRC	*FILE	PF-SRC	RPG Program Source (Modern)
—	QSRVSR	*FILE	PF-SRC	Service Program Binder Source
—	QTXSRC	*FILE	PF-SRC	SQL Scripts & General Public License

Bottom

Parameters or command

- ===>
- F3=Exit      F4=Prompt      F5=Refresh      F6=Create
- F9=Retrieve      F10=Command entry      F23=More options      F24=More keys



Work with Members Using PDM

S06BA2CP

File . . . . . QRPGLSRC  
Library . . . . . JONESOBJ      Position to . . . . . \_\_\_\_\_

Type options, press Enter.  
2=Edit            3=Copy   4=Delete 5=Display            6=Print            7=Rename  
8=Display description   9=Save   13=Change text   14=Compile   15=Create module...

Opt	Member	Type	Text
—	CLASSMNT	SQLRPGLE	Class Maintenance
—	STDENTAGGR	SQLRPGLE	Standard Entity Aggregate Functions
—	STDENTGRP	SQLRPGLE	Standard Entity Group Functions
—	STDENTINP	SQLRPGLE	Standard Entity Input Functions
—	STDENTOUT	SQLRPGLE	Standard Entity Output Functions
—	STDENTRULE	SQLRPGLE	Standard Entity Business Rules
—	STDENTSQL1	SQLRPGLE	Standard Entity SQL Wrappers
—	STDENTSQL2	SQLRPGLE	Standard Entity SQL Wrappers

More...

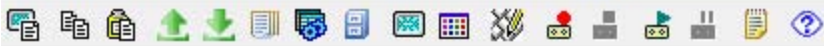
Parameters or command  
===> \_\_\_\_\_  
F3=Exit            F4=Prompt            F5=Refresh            F6=Create  
F9=Retrieve        F10=Command entry    F23=More options      F24=More keys





A - 5250 Display

File Edit View Communication Actions Window Help



SQL source members

Work with Members Using PDM

S06BA2CP




File . . . . . QXTSRC  
Library . . . . . JONESOBJ Position to . . . . .

Type options, press Enter.  
2=Edit 3=Copy 4=Delete 5=Display 6=Print 7=Rename  
8=Display description 9=Save 13=Change text 14=Compile 15=Create module...

Opt	Member	Type	Text
—	GPL	TXT	GNU General Public License
—	INUENDO	SQL	Create Database Objects
—	STDENTAGGR	SQL	SQL Functions For STDPRPAGGR
—	STDENTGRP	SQL	SQL Functions For STDENTGRP
—	STDENTINP	SQL	SQL Functions For STDENTINP
—	STDENTOUT	SQL	SQL Functions For STDENTOUT
—	STDENTRULE	SQL	SQL Functions For STDENTRULE
—	STDENTUTIL	SQL	SQL Functions For STDENTUTIL


More...

Parameters or command  
==>  
F3=Exit F4=Prompt F5=Refresh F6=Create  
F9=Retrieve F10=Command entry F23=More options F24=More keys



System i Navigator

File Edit View Help



Environment: My Connections

S06ba2cp

Schemas

APLUS8F21

INUENDODEV

JONESDTA

JONESOBJ

All Objects

Aliases

Column Masks

Constraints

Functions

Global Variables

Indexes

Journal Receivers

Journals

Procedures

Row Permissions

Sequences

SQL Packages

Tables

Triggers

Types

Views

XML Schema Repository

QGPL

QSYS2

QUSRSYS

RPG21

RPTMOD

RPTMODSRC

I.gemko.com: Functions

Database: S06ba2cp

Schema: JONESOBJ

Name	Specific Name	Type	Returns	Input Parameters	Fenced	Secure	Prog
ANCESTOR	ANCESTOR	External	BIGINT	2	No	No	*LIE
COPYENTITY	COPYENTITY	External	BIGINT	2	No	No	*LIE
DELETEENTITY	DELETEENTITY2	External	CHAR()	2	No	No	*LIE
DELETEENTITY	DELETEENTITY1	External	CHAR()	1	No	No	*LIE
DUPENTITY	DUPENTITY	External	BIGINT	4	No	No	*LIE
DUPENTITY	DUPENTITYND	External	BIGINT	3	No	No	*LIE
DUPENTITY	DUPENTITYN	External	BIGINT	2	No	No	*LIE
DUPENTITY	DUPENTITYAD	External	BIGINT	3	No	No	*LIE
DUPENTITY	DUPENTITYA	External	BIGINT	2	No	No	*LIE
ENTITYAVG	ENTITYAVGM	External	DECIMAL()	4	No	No	*LIE
ENTITYAVG	ENTITYAVG	External	DECIMAL()	3	No	No	*LIE
ENTITYCOUNT	ENTITYCOUNTM	External	DECIMAL()	3	No	No	*LIE
ENTITYCOUNT	ENTITYCOUNT	External	DECIMAL()	2	No	No	*LIE
ENTITYMAX	ENTITYMAXM	External	DECIMAL()	4	No	No	*LIE
ENTITYMAX	ENTITYMAX	External	DECIMAL()	3	No	No	*LIE
ENTITYMIN	ENTITYMINM	External	DECIMAL()	4	No	No	*LIE
ENTITYMIN	ENTITYMIN	External	DECIMAL()	3	No	No	*LIE
ENTITYSUM	ENTITYSUMM	External	DECIMAL()	4	No	No	*LIE
ENTITYSUM	ENTITYSUM	External	DECIMAL()	3	No	No	*LIE
FIREDBYPGM	FIREDBYPGM	External	CHAR()	1	No	No	*LIE
FIREDBYPROC	FIREDBYPROC2	External	CHAR()	2	No	No	*LIE
FIREDBYPROC	FIREDBYPROC1	External	CHAR()	1	No	No	*LIE
GETCLASS	GETCLASS	External					
GETDATE	GETDATEM	External					
GETDATE	GETDATE	External					
GETDATEA	GETDATEAM	External					
GETDATEA	GETDATEA	External					
GETDATEN	GETDATENM	External	NUMERIC()	4	No	No	*LIE
GETDATEN	GETDATEN	External	NUMERIC()	3	No	No	*LIE
GETDATX	GETDATXM	External	DATE	3	No	No	*LIE

My Tasks - I.gemko.com

Databases tasks

Add a connection

Select schemas to display

Import data into a table

1 - 30 of 112 objects

Preloaded SQL functions

Overloaded functions:

- GET, PUT operations
- ID Resolution

## Subtable GET functions

These functions retrieve values from the data type subtables for the specified EntityID and Property nickname that was in effect at a specified Moment in time.

Function **getDate** – returns *date*

`getDate(EntityID entityID, Property note, Moment timestamp)`

`getDate(EntityID entityID, Property note)`

Returns the VALUE column from subtable ENTDATE for the combination of **EntityID** and **Property** that was in effect at the specified **Moment**. If **Moment** is not specified, the current system time stamp is assumed.

**Property** may be one of the following:

- A valid nickname for a *date* type property associated with the class of the **EntityID**.
- A period delimited path of cascading link property nicknames followed by a valid nickname for a *date* type property associated with the class of the rightmost link property in the cascading path.

Exports for RPG	STIDENTINP(GETDATE)
Exports for SQL	STDENTSQLE(GETDATE3) STDENTSQLE(GETDATE2)

## 2. Data Types Legend

DATA TYPES LEGEND		
<i>Inuendo type</i>	Native type	Primary uses
<i>entityID</i>	Bigint	Unique ID or Parent ID in ENTHEAD. Entity ID in all data type subtables.
<i>flag</i>	Char(1)	VALUE column in subtable ENTFLAG. STATUS column in ENTHEAD.
<i>job</i>	Char(6)	CREATEJNUM column in ENTHEAD. CHANGEJNUM column in all data type subtables.
<i>legacyN</i>	Bigint	LEGACYN column in ENTHEAD.
<i>link (same as entityID)</i>	Bigint	VALUE column in subtable ENTLINK.
<i>name</i>	Char(10)	CREATEJNAM column in ENTHEAD. CHANGEJNAM column in all data type subtables.
<i>nickname</i>	Varchar(14)	CLASS column in ENTHEAD. PROPERTY column in all data type subtables.
<i>note</i>	Varchar(254)	VALUE column in subtable ENTNOTE. DESCRIPTOR column in ENTHEAD. Period delimited property path used in GET functions.
<i>notx (encrypted note)</i>	Varchar(254)	VALUE column in subtable ENTNOTX.
<i>number</i>	Decimal(23,5)	VALUE column in subtable ENTNUMB.
<i>user</i>	Char(18)	CHANGEUSER column in all data type subtables. CREATEUSER column in ENTHEAD.



## Table structures (cont.)

### Table **ENTDATE** – Entity Dates

Contains one for each historical change in value made to each Property of type DATE for each Class. The row contains time, user and program stamps for audit and time travel purposes.

Column	Type	Description
EntityID	<i>entityID</i>	Database wide unique identifier. Must exist in ENTHEAD.
Property	<i>nickname</i>	The associative name of the Property. Must be a valid Property nickname for the Class of this EntityID.
Value	<i>date</i>	The value assigned to the property for this entity.
ChangeTime	<i>timestamp</i>	The system time stamp when the value was assigned.
ChangeJnam	<i>name</i>	IBM i job name which assigned this value to the property.
ChangeUser	<i>user</i>	User ID which assigned this value to the property.
ChangeJnum	<i>job</i>	IBM i job number which assigned this value to the property.
ChangeProg	<i>name</i>	IBM i program name which assigned this value to the property.
Primary key	EntityID, Property, ChangeTime	

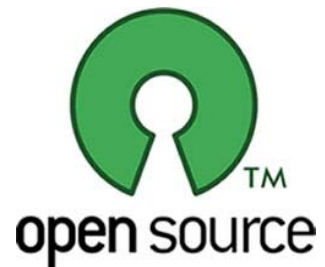
Click to add notes





...Out of the Garage

A first crack at it





## Our first crack.....

RUNDOWN
Y ASK Y
SAM ADAMS
LAST TIME
STATI
GET IT UP
SOURCE
GOT THE FUNC
BLAME THE REF
57 STATES
CLASS WARFARE
MORE...

- State/province master from aging ERP software package.
  - Code & name only
- Simple class with no properties.
  - Subordinate to the Founder, probably.
  - Code will be Alpha Legacy ID in ENTHEAD.
  - Name will be Descriptor in ENTHEAD.
- If they're needed in future, we'll be ready !
- No immediate plans for app retrofit.
  - For now, we'll just replicate real time to Inuendo virtual tables.
- But first we must create a STATE class.



## Class maintenance...

- Create, change and delete class and property nicknames in ENTPROP table.
  - Used by all standard I/O functions.
  - Deletes allowed if not used at all.
- Currently available for 5250 only.
  - Browser based (probably PHP) planned.
  - Need open source community assistance.
- Option 1 on Inuendo main menu.

RUNDOWN
Y ASK Y
SAM ADAMS
LAST TIME
STATI
GET IT UP
SOURCE
GOT THE FUNC
BLAME THE REF
57 STATES
CLASS WARFARE...
MORE...



INUENDO

INUENDO Menu

Select one of the following:

1. Class/Property Maintenance
2. Set Session Moment
3. Display Session Moment
4. Clear Session Moment
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
90. Sign off

Selection or command

==> \_

F3=Exit F4=Prompt F9=Retrieve F12=Cancel  
F13=Information Assistant F16=System main menu

MA A

MW

20/007

Opts: C=Change D=Delete P=Properties

Class Maintenance

CLASSMNT 20:29:44  
CFB 4/25/17

Find: \_\_\_\_\_

Op	Class	Description
—	ADDRBOOK	ADDRESS BOOK
—	ADDRESS	STANDARD ADDRESS
—	ARAGING	ACCOUNTS RECEIVABLE AGING CODE
—	ARCALLREP	ACCOUNTS RECEIVABLE CALL REP
—	ARTERMS	ACCOUNTS RECEIVABLE TERMS CODE
—	CARRIER	DELIVERY CARRIER
—	CLASSERROR	CLASS ERROR OR VIOLATION
—	COMPANY	COMPANY / BUSINESS UNIT
—	CONSBILL	CONSOLIDATED BILLING CODE
—	CORPGROUP	CORPORATE GROUP
—	COUNTRY	COUNTRY CODES
—	CUSTCLASS	CUSTOMER CLASS
—	CUSTCOMMIT	CUSTOMER COMMITMENT CODE
—	CUSTCONTRACT	CUSTOMER CONTRACT CODE
—	CUSTGLCODE	CUSTOMER GENERAL LEDGER CODE
—	CUSTOMER	CUSTOMER MASTER

For sample purposes only. Not in open source.

Press

More...

F3=Exit

F6=Create

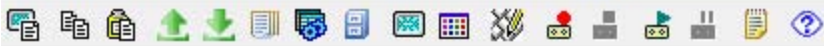
ENTER=Continue





A - 5250 Display

File Edit View Communication Actions Window Help



**Adding a Class**

Opts: C=Change D=Delete P=Properties

**Class Maintenance**

CLASSMNT 20:29:44  
CFB 4/25/17

Find: \_\_\_\_\_

Op	Class	Description
—	ADDRBOOK	ADDRESS BOOK
—	ADDRESS	STANDARD ADDRESS
—	ARAGING	ACCOUNTS RECEIVABLE AGING CODE
—	ARCALLREP	ACCOUNTS RECEIVABLE CALL REP
—	ARTERMS	ACCOUNTS RECEIVABLE TERMS CODE
—	CARRIER	DELIVERY CARRIER
—	CLASSERROR	CLASS ERROR OR VIOLATION
—	COMPANY	COMPANY / BUSINESS UNIT

Press ENTER to ADD

F12=Cancel

<u>Class</u>	<u>Description</u>
STATE	STATE / PROVINCE
<u>Parent Class</u>	(or blank for any class)

F3=Ex

MA A

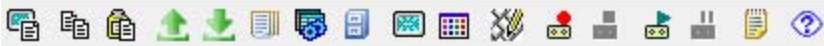
MW

18/042



A - 5250 Display

File Edit View Communication Actions Window Help



Drill down to properties

Opts: C=Change D=Delete P=Properties

Class Maintenance

Find: \_\_\_\_\_

CLASSMNT 20:34:46  
CFB 4/25/17

Op	Class	Description
—	CUSTSUBCLASS	CUSTOMER SUB CLASS
—	DATATYPE	STANDARD DATA TYPE W/SUBTABLE
—	FOBCODE	FREIGHT ON BOARD CODE
—	FOUNDER	DATABASE FOUNDER
—	GEOCODE	GEOGRAPHICAL CODE
—	HOLDMATRIX	HOLD CODE MATRIX CODE
—	INCREMENT	INCREMENTAL TRANSACTION FOR LEGACY BUCKET
—	PAYMENTCODE	PAYMENT CODE
—	PHONE	STANDARD PHONE
—	PRICEDISC	PRICE DISCOUNT CODE
—	PROPERROR	PROPERTY ERROR OR VIOLATION
—	REBATECLASS	REBATE CLASS
—	ROUTE	DELIVERY ROUTE
—	SALESREP	SALES REPRESENTATIVE
—	SHIPTO	SHIP TO LOCATION
P	STATE	STATE / PROVINCE

More...

F3=Exit

F6=Create

ENTER=Continue

MA A

MW

03/010



Class: STATE  
Desc: STATE / PROVINCE  
Opts: C=Change D=Delete

Class Maintenance	
CLASSMNT	20:35:24
CFB	4/25/17

0	Property	Type	Seqn	Description
---	----------	------	------	-------------

NO PROPERTIES TO DISPLAY

Press

Bottom

F3=Exit	F6=Create	F12=Cancel	F20=Resquence	ENTER=Continue
MA	A	MW		01/001

Class: STATE  
Desc: STATE / PROVINCE  
Opts: C=Change D=Delete

Class Maintenance	
CLASSMNT	20:35:24
CFB	4/25/17

0	Property	Type	Seqn	Description
---	----------	------	------	-------------

NO PROPERTIES TO DISPLAY

Round robin

Press ENTER to ADD

F4=Types

F12=Cancel

Property	Type	Seqn	Description
GOVERNOR	NOTE	10	NAME OF CURRENT GOVERNOR

|

+-----> FREEFORM VARIABLE LENGTH CHARACTER (254)

Class: STATE  
Desc: STATE / PROVINCE  
Opts: C=Change D=Delete

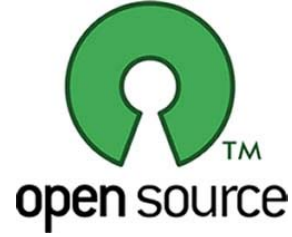
Class Maintenance  
CLASSMNT 20:39:21  
CFB 4/25/17

0	Property	Type	Seqn	Description
	GOVERNOR	NOTE	10	NAME OF CURRENT GOVERNOR

Can re-sequence as desired (change option).  
Can delete if no values have ever been assigned.

Best of all...can add during business hours !

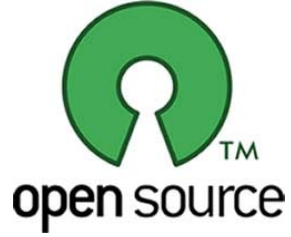
Bottom



## Real time replication...

- Rule #1: You need to become comfortable with using triggers.
  - Without them, it is not feasible to address each and every program which updates the candidate legacy file.
  - Some companies turn one or two bad experiences into a lifetime ban against triggers. That is unfortunate (for them).
- Rule #2: No avoiding Rule #1.
- Rule #3: Learn how to shoot safely by practicing in test environment.

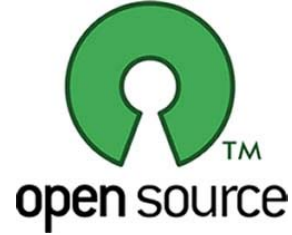
RUNDOWN
PROPERTY RIGHTS
2 <sup>ND</sup> AMENDMENT
VOTER ID
'N SYNCH
ALWAYS RIGHT
TRANNIES
HOLD MY SPOT
DIRTY WORK
NEXT TIME
Q & A
BOTTOM



# Identity resolution is #1 priority.....

RUNDOWN
PROPERTY RIGHTS
2 <sup>ND</sup> AMENDMENT
VOTER ID
'N SYNCH
ALWAYS RIGHT
TRANNIES
HOLD MY SPOT
DIRTY WORK
NEXT TIME
Q & A
BOTTOM

- Need a unique key in legacy file consistent with new class relationships.
  - Example: Customer within Company.
- OR a reliable place to hide a copy of the unique Entity ID within legacy record.
  - Determines whether newEntity() is used.
  - Use this approach as your last resort, however.
- Ambiguity is your enemy. Repeat this phrase.
  - Legacy order numbers that roll over, etc.
- Once identity established and new entities created, the rest is mostly PUT functions.
- Use MONITOR on un-reliable legacy data or where date conversions needed.

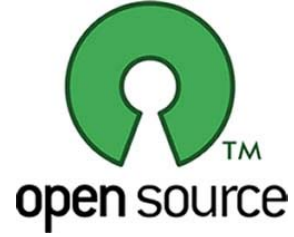


## Synchronization triggers.....

RUNDOWN
PROPERTY RIGHTS
2 <sup>ND</sup> AMENDMENT
VOTER ID
'N SYNCH
ALWAYS RIGHT
TRANNIES
HOLD MY SPOT
DIRTY WORK
NEXT TIME
Q & A
BOTTOM

- Capture insert, delete and update events on legacy data file.
- Requirements:
  - Know (or determine) the Parent ID.
  - Desired Class must have been defined.
  - Legacy ID must be unique.
- Create new Entity if it does not exist.
- Set value of associated Properties.
- Should be error proof & efficient.
- Initial load can be achieved with phantom SQL update statement (set column equal to itself).
- **Demonstrate SYNSTATE program here.**



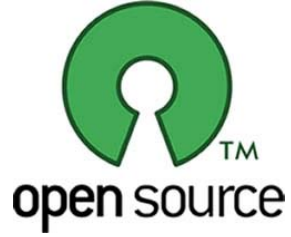


## Our second crack.....

RUNDOWN
PROPERTY RIGHTS
2 <sup>ND</sup> AMENDMENT
VOTER ID
'N SYNCH
ALWAYS RIGHT..
TRANNIES
HOLD MY SPOT
DIRTY WORK
NEXT TIME
Q & A
BOTTOM

- Customer master from same ERP.
- Want better visibility of maintenance.
- Want justification for “buckets”.
  - Welcome to Transaction Synthesis.
- Want to keep similar addresses consistent across related customers.
- Want to normalize properties (fields) with a limited number of valid values.
- No immediate plans for app retrofit.

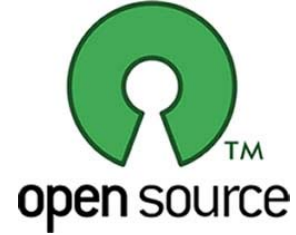




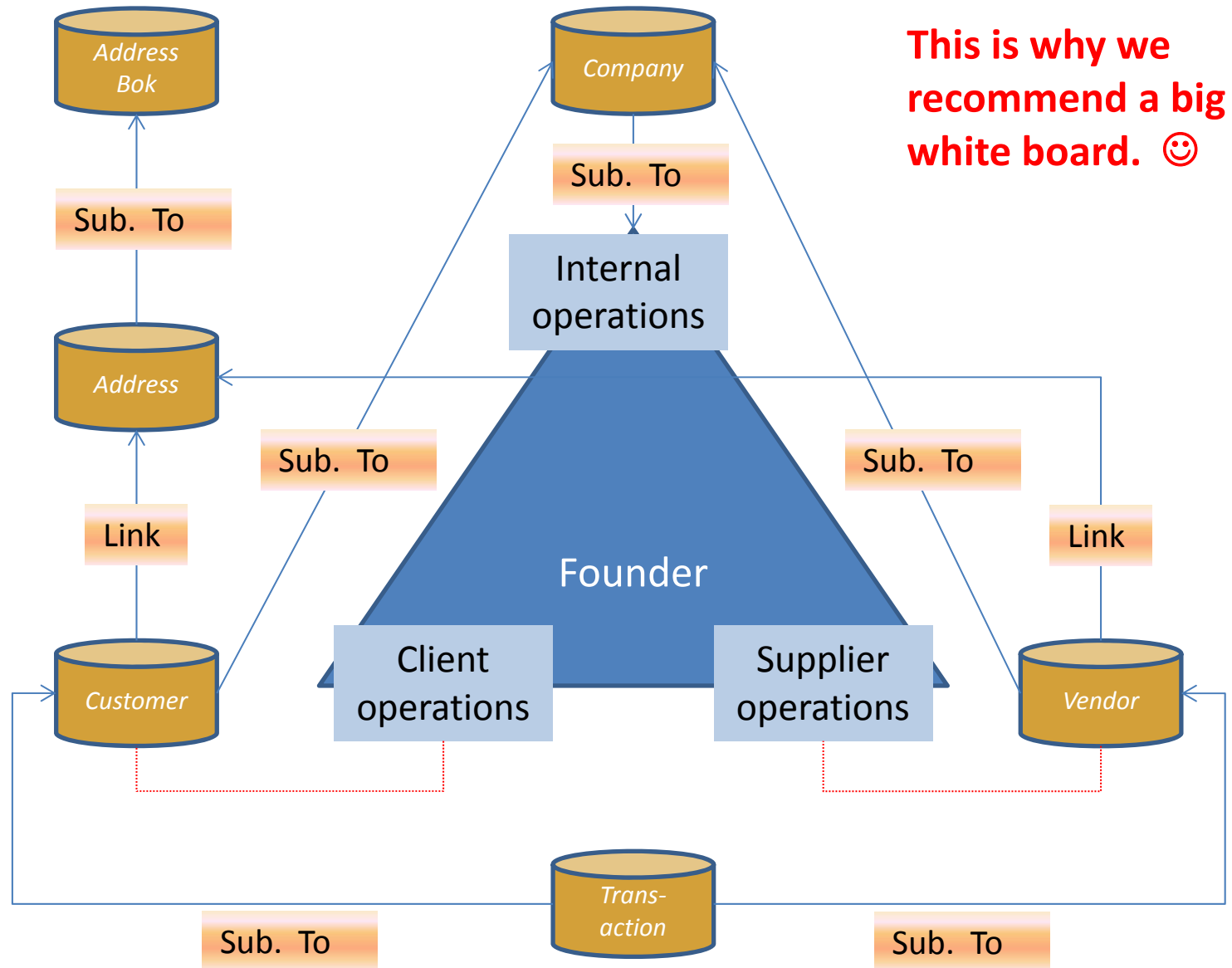
## Customer Master layout....

RUNDOWN
PROPERTY RIGHTS
2 <sup>ND</sup> AMENDMENT
VOTER ID
'N SYNCH
ALWAYS RIGHT.
TRANNIES
HOLD MY SPOT
DIRTY WORK
NEXT TIME
Q & A
BOTTOM

- Over 200 fields
  - Flags, addresses, buckets, amounts, etc.
  - Multiple classes, not one big class
- Will involve all data type subtables.
- Customer unique within Company in ERP database.
  - Wish to replicate that relationship.
  - Will need a Company class, probably subordinate to the Founder.
  - Customer will be subordinate to Company.
- Show Excel file with legacy record layout.



RUNDOWN
PROPERTY RIGHTS
2 <sup>ND</sup> AMENDMENT
VOTER ID
'N SYNCH
ALWAYS RIGHT
TRANNIES
HOLD MY SPOT
DIRTY WORK
NEXT TIME
Q & A
BOTTOM

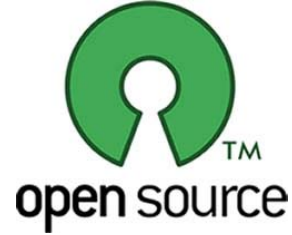




# Transaction synthesis.....

RUNDOWN
PROPERTY RIGHTS
2 <sup>ND</sup> AMENDMENT
VOTER ID
'N SYNCH
ALWAYS RIGHT
TRANNIES
HOLD MY SPOT
DIRTY WORK
NEXT TIME
Q & A
BOTTOM

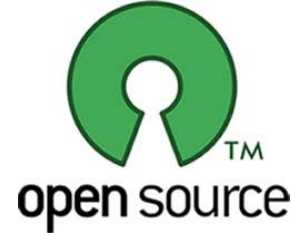
- Captures deltas to legacy buckets and converts them to transaction entities.
  - Example – Customer YTD sales.
  - Difference between before and after image, if any.
- Subordinate to the class of the legacy business entity.
- Generally contain the following properties:
  - Nickname (NOTE type) indicative of which legacy bucket.
  - Quantity of type NUMB.
  - Amount of type NUMB.
  - Effective date (if different from creation).
- Business rule(s) to calculate sum over a date range for a specified Entity ID/Nickname combination.
  - Typically SQL function(s) on a \*SRVPGM export.
- Single transaction class could accommodate many legacy object types.
- A good fiscal calendar is recommended.



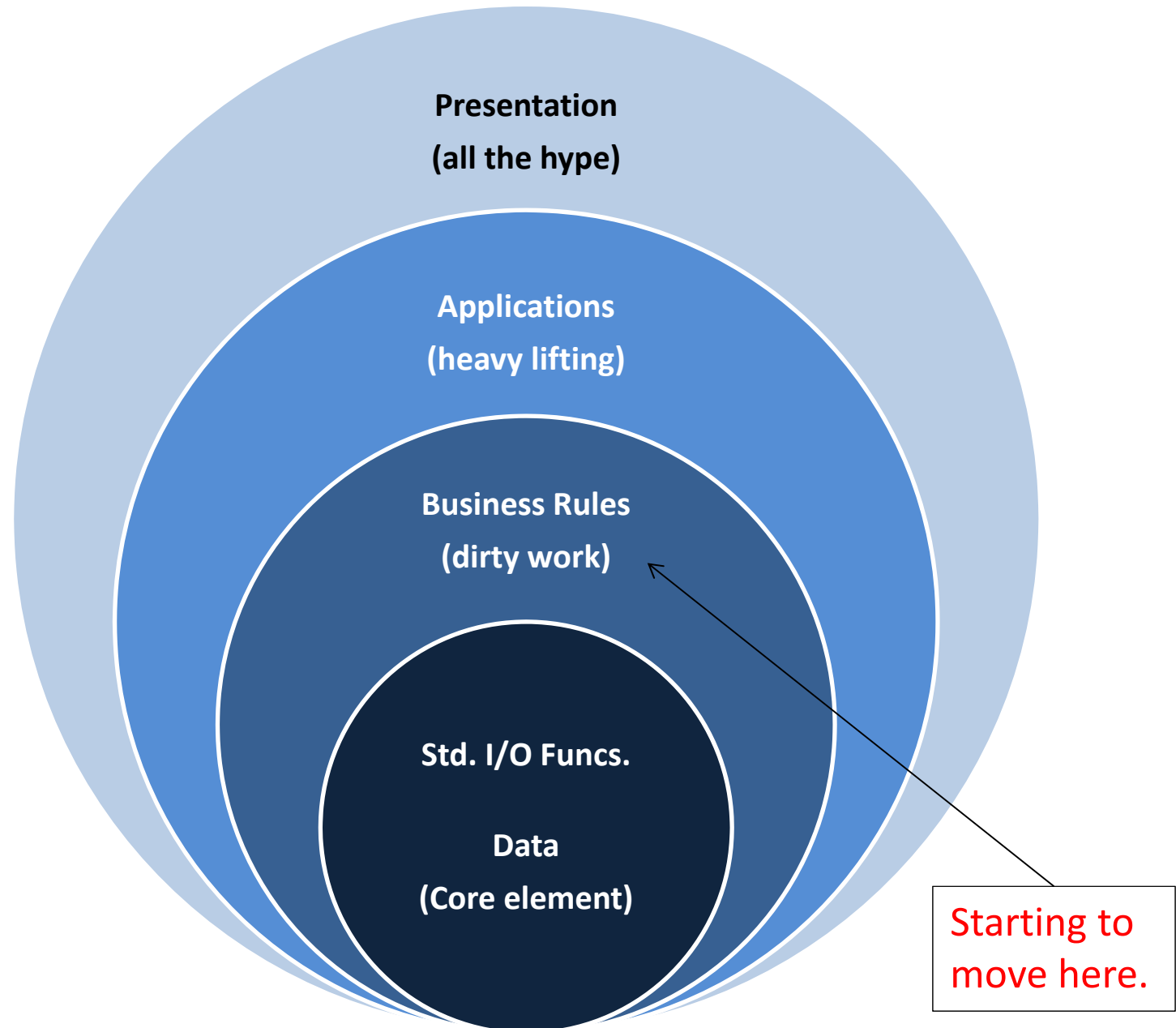
## Other synch considerations....

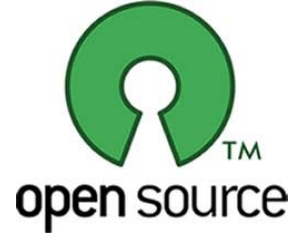
- Condition all PUT functions on whether the value of the legacy field changed.
  - Reduces overhead.
- For LINK properties whose entities haven't been migrated yet, reserve a place holder for them using newEntity.
  - Of course, must define their Class first.
- On first synch, capture "before" images of buckets and produce a backdated transaction for historical purposes.
  - That way, business rules produce same results.
- **Demonstrate SYNCUST program here.**

RUNDOWN
PROPERTY RIGHTS
2 <sup>ND</sup> AMENDMENT
VOTER ID
'N SYNCH
ALWAYS RIGHT
TRANNIES
HOLD MY SPOT
DIRTY WORK
NEXT TIME
Q & A
BOTTOM



RUNDOWN
PROPERTY RIGHTS
2 <sup>ND</sup> AMENDMENT
VOTER ID
'N SYNCH
ALWAYS RIGHT
TRANNIES
HOLD MY SPOT
DIRTY WORK
NEXT TIME
Q & A
BOTTOM

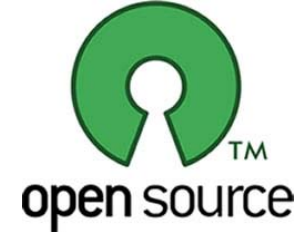




## Where the car goes from here.....

RUNDOWN
PROPERTY RIGHTS
2 <sup>ND</sup> AMENDMENT
VOTER ID
'N SYNCH
ALWAYS RIGHT
TRANNIES
HOLD MY SPOT
DIRTY WORK
NEXT TIME
Q & A
BOTTOM

- Summation functions on synthesized transactions are the first example of the next layer of business rules.
- Some will be common with other shops, some will be unique to your business.
- Especially useful if shared across functional areas.
- Combination of Standard I/O Functions and business rules are the key components in an application refit.
- We'll have another follow up soon.



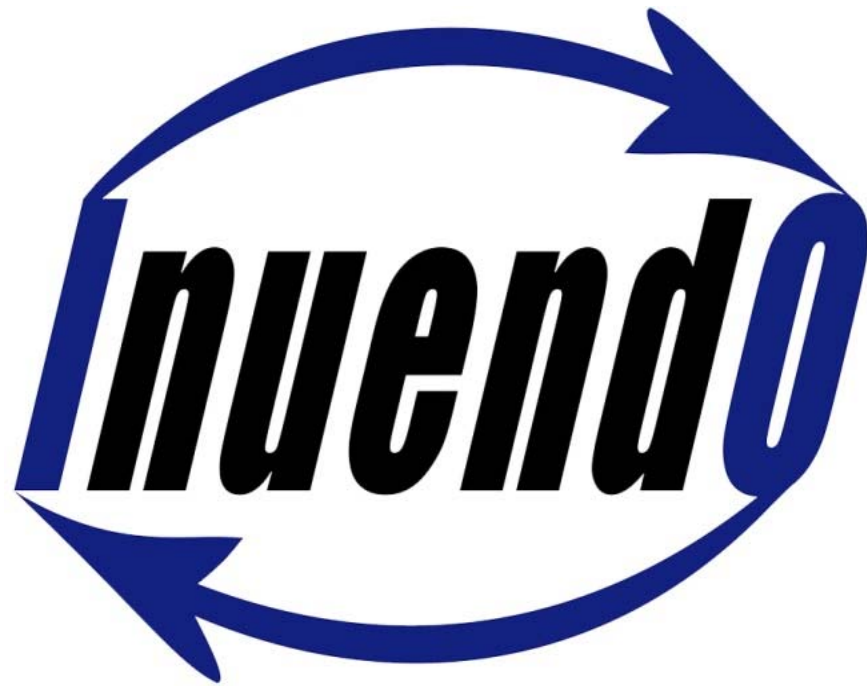
# Questions

(and hopefully answers)

RUNDOWN
PROPERTY RIGHTS
2 <sup>ND</sup> AMENDMENT
VOTER ID
'N SYNCH
ALWAYS RIGHT
TRANNIES
HOLD MY SPOT
DIRTY WORK
NEXT TIME
Q & A
BOTTOM







@InuendoData

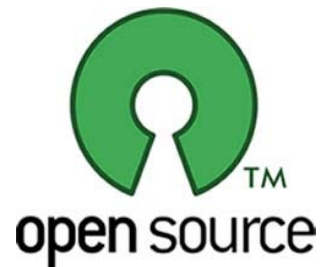
...Out of the Garage

Thank you for your attention !

Christopher F. Burns, Sr.



cburns@inuendo.us





...Out of the Garage

Live time travel demo





But, just in case technology fails.....

- New Inuendo database installed in time machine partition on 10/19.
- State and Customer masters replicated on 10/19 using triggers from demo.
- Daily maintenance performed on customer 200 in company 1.
- Simple Inuendo compliant customer inquiry program written.
- We will browse this customer using four different settings of QDATE.

RUNDOWN
PROPERTY RIGHTS
2 <sup>ND</sup> AMENDMENT
VOTER ID
'N SYNCH
ALWAYS RIGHT
TRANNIES
HOLD MY SPOT
DIRTY WORK
NEXT TIME
Q & A
BOTTOM



Time Machine maintenance				
Date	Customer	Change made	Old value	New Value
10/19/2012		Initial population		
10/20/2012	200	Address line 2		Locker #18A
10/20/2012	200	Country		USA
10/20/2012	200	AP Contact	Herb Alton	Boris the Animal
10/21/2012	200	Address line 3		Where "K" hides his neurolizer
10/21/2012	200	Zip Code	02722-0109	77777-8888
10/21/2012	200	AP Contact	Boris the Animal	It's just "BORIS"
10/22/2012	200	City	Fall River	New York
10/22/2012	200	St/Prov	MA	NY
10/22/2012	200	PO Contact	Margo Smithers	Grandpa Kait
10/23/2012	200	Name	Manufacturing Solutions	We are the Men in Black
10/23/2012	200	Address line 1	P.O. Box 109	MIB Headquarters
10/23/2012	200	PO Phone	617-678-7556	716-250-5536

Session A - [24 x 80]

FileEditViewCommunicationActionsWindowHelp

Host: 10.10.200.47Port: 23Workstation ID:

After changing QDATE to 10/18/12

Work with System Status

TIMEMACH  
10/18/12 20:55:14

% CPU used . . . . . : .0  
Elapsed time . . . . . : 00:00:01  
Jobs in system . . . . . : 4779  
% perm addresses . . . . . : .007  
% temp addresses . . . . . : .010

Auxiliary storage:  
System ASP . . . . . : 46.61 G  
% system ASP used . . . : 84.1487  
Total . . . . . : 46.61 G  
Current unprotect used : 2301 M  
Maximum unprotect . . . : 2356 M

Type changes (if allowed), press Enter.

System Pool	Pool Size (M)	Reserved Size (M)	Max Active	-----DB----- Fault	Pages	---Non-DB--- Fault	Pages
1	290.71	134.29	+++++	.0	.0	.0	.0
2	711.23	32.71	36	.0	.0	.0	.0
3	533.80	.00	57	.0	.0	.0	.0
4	.25	.00	5	.0	.0	.0	.0

Bottom

Command  
==> CALL PGM(CUSTINQ)

F3=ExitF4=PromptF5=RefreshF9=RetrieveF10=RestartF12=Cancel

F19=Extended system statusF24=More keys

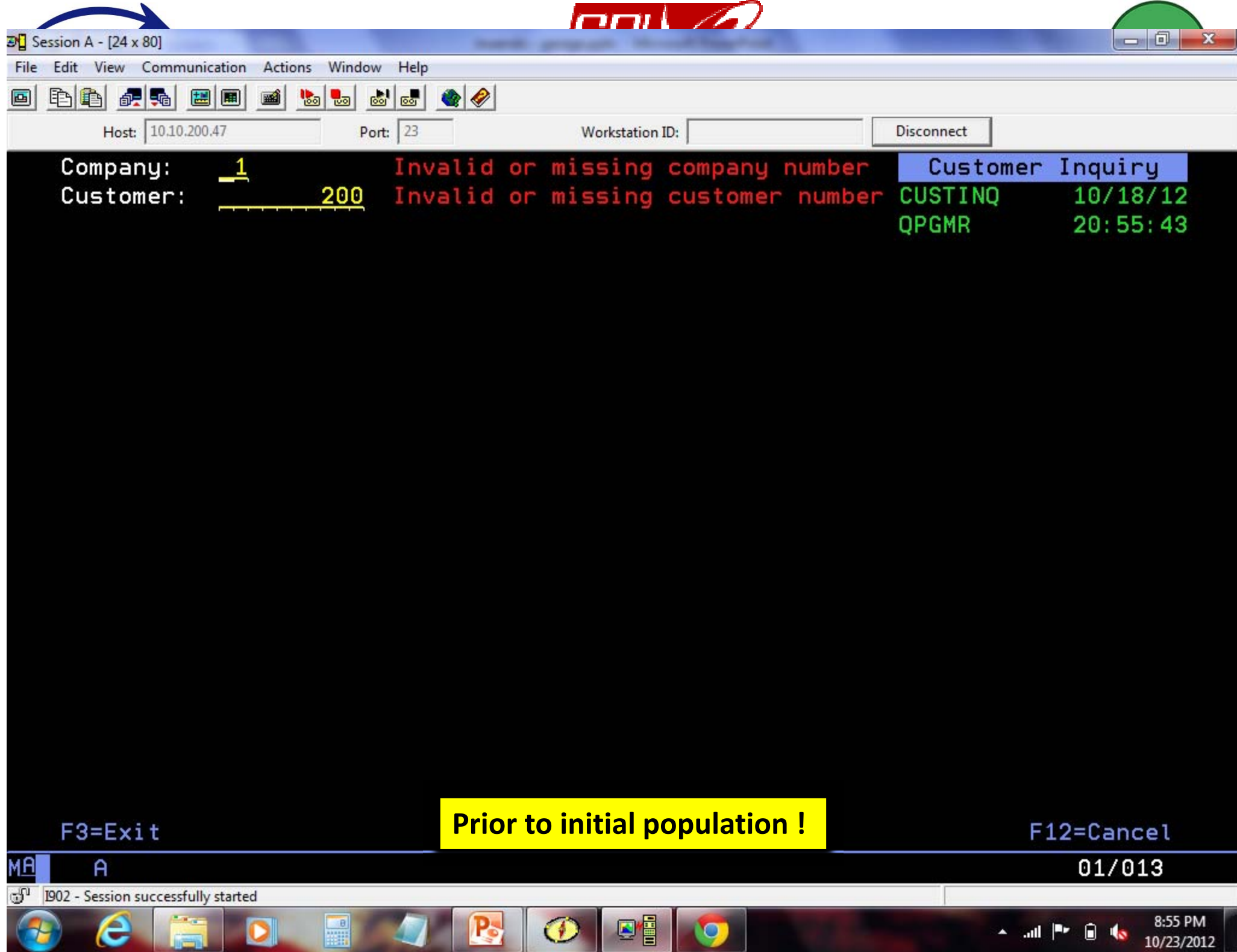
MAA

21/007

1902 - Session successfully started

8:55 PM  
10/23/2012









Host: 10.10.200.47

Port: 23

Workstation ID:

After changing QDATE to 10/19/12

## Work with System Status

TIMEMACH

10/19/12 20:53:20

```
% CPU used . . . . . : .4
Elapsed time . . . . . : 00:00:01
Jobs in system . . . . . : 4778
% perm addresses . . . . . : .007
% temp addresses . . . . . : .010
```

## Auxiliary storage:

```
System ASP . . . . . : 46.61 G
% system ASP used . . . : 84.1399
Total . . . . . : 46.61 G
Current unprotect used : 2299 M
Maximum unprotect . . . : 2356 M
```

Type changes (if allowed), press Enter.

System Pool	Pool Size (M)	Reserved Size (M)	Max Active	-----DB----- Fault	Pages	---Non-DB--- Fault	Pages
1	296.65	134.29	+++++	.0	.0	.0	.0
2	677.19	32.70	36	.0	.0	.0	.0
3	561.89	.00	57	.0	.0	.0	.0
4	.25	.00	5	.0	.0	.0	.0

Bottom

## Command

==&gt; CALL PGM(CUSTINQ)

F3=Exit F4=Prompt F5=Refresh F9=Retrieve F10=Restart F12=Cancel  
F19=Extended system status F24=More keys

MA A

21/007

1902 - Session successfully started



Session A - [24 x 80]

FileEditViewCommunicationActionsWindowHelp

Host: 10.10.200.47Port: 23Workstation ID: Disconnect

Company: 1Customer: 200

Customer Inquiry

CUSTINQ 10/19/12

QPGMR 20:54:19

Name: Manufacturing Solutions

Address: P.O. Box 109

City: Fall River

St/Prov: MA

Postal: 02722-0109

Phone: A/C Pfx Line Extn Contact

Purch: 617 678 7556 0000 Margo Smithers

Acc Pay: 617 679 4710 0000 Herb Alton

Fax: 617 679 4700 0000

F3=Exit

Changes up through Moment

F12=Cancel

MA A

01/013

1902 - Session successfully started

8:54 PM 10/23/2012



Host: 10.10.200.47

Port: 23

Workstation ID:

After changing QDATE to 10/20/12

## Work with System Status

TIMEMACH

10/20/12 20:52:14

```
% CPU used . . . . . : .0
Elapsed time . . . . . : 00:00:01
Jobs in system . . . . . : 4777
% perm addresses . . . . . : .007
% temp addresses . . . . . : .010
```

```
Auxiliary storage:
System ASP . . . . . : 46.61 G
% system ASP used . . . : 84.1333
Total . . . . . : 46.61 G
Current unprotect used : 2299 M
Maximum unprotect . . . : 2356 M
```

Type changes (if allowed), press Enter.

System Pool	Pool Size (M)	Reserved Size (M)	Max Active	-----DB-----	---Non-DB---		
				Fault	Pages	Fault	Pages
1	296.65	134.29	+++++	.0	.0	.0	.0
2	677.19	32.70	36	.0	.0	.0	.0
3	561.89	.00	57	.0	.0	.0	.0
4	.25	.00	5	.0	.0	.0	.0

Bottom

## Command

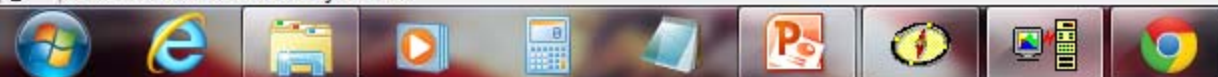
==&gt; CALL PGM(CUSTINQ)

F3=Exit F4=Prompt F5=Refresh F9=Retrieve F10=Restart F12=Cancel  
 F19=Extended system status F24=More keys

MA A

21/007

1902 - Session successfully started





Session A - [24 x 80]

FileEditViewCommunicationActionsWindowHelp

Host: 10.10.200.47Port: 23Workstation ID: Disconnect

Company: 1Customer: 200

Customer Inquiry

CUSTINQ 10/20/12

QPGMR 20:52:44

Name: Manufacturing Solutions

Address: P.O. Box 109Locker #18A

City: Fall River

St/Prov: MA

Postal: 02722-0109

Phone: A/C Pfx Line Extn Contact

Purch: 617 678 7556 0000 Margo Smithers

Acc Pay: 617 679 4710 0000 Boris the Animal

Fax: 617 679 4700 0000

F3=Exit

Changes up through Moment

F12=Cancel

MA A

01/013

1902 - Session successfully started

8:52 PM10/23/2012



Session A - [24 x 80]

FileEditViewCommunicationActionsWindowHelp

Host: 10.10.200.47Port: 23Workstation ID: Disconnect

Company: 1Customer: 200

Customer Inquiry

CUSTINQ 10/21/12

QPGMR 20:51:38

Name: Manufacturing Solutions

Address: P.O. Box 109

Locker #18A

Where "K" hides his neurolizer

City: Fall River

St/Prov: MA

Postal: 77777-8888

Phone: A/C Pfx Line Extn Contact

Purch: 617 678 7556 0000 Margo Smithers

Acc Pay: 617 679 4710 0000 It's just "BORIS"

Fax: 617 679 4700 0000

F3=ExitChanges up through MomentF12=Cancel

MA A01/013

1902 - Session successfully started

8:51 PM10/23/2012





Host: 10.10.200.47

Port: 23

Workstation ID:

After changing QDATE to 10/22/12

## Work with System Status

TIMEMACH

10/22/12 20:49:46

```
% CPU used . . . . . : 26.3
Elapsed time . . . . . : 00:00:01
Jobs in system . . . . . : 4777
% perm addresses . . . . . : .007
% temp addresses . . . . . : .010
```

```
Auxiliary storage:
System ASP . . . . . : 46.61 G
% system ASP used . . . : 84.0957
Total . . . . . : 46.61 G
Current unprotect used : 2304 M
Maximum unprotect . . . : 2348 M
```

Type changes (if allowed), press Enter.

System Pool	Pool Size (M)	Reserved Size (M)	Max Active	-----DB-----	---Non-DB---		
				Fault	Pages	Fault	Pages
1	296.65	134.21	+++++	.0	.0	.0	.0
2	677.19	32.69	36	.0	.0	35.7	134.9
3	561.89	.00	57	.0	.0	.0	.0
4	.25	.00	5	.0	.0	.0	.0

Bottom

## Command

==&gt; CALL PGM(CUSTINQ)

F3=Exit F4=Prompt F5=Refresh F9=Retrieve F10=Restart F12=Cancel  
 F19=Extended system status F24=More keys

MA A

21/007

1902 - Session successfully started



Session A - [24 x 80]

FileEditViewCommunicationActionsWindowHelp

Host: 10.10.200.47Port: 23Workstation ID: Disconnect

Company: 1Customer: 200

Customer Inquiry

CUSTINQ 10/22/12

QPGMR 20:50:21

Name: Manufacturing Solutions

Address: P.O. Box 109

Locker #18A

Where "K" hides his neurolyzer

City: New York

St/Prov: NY

Postal: 77777-8888

Phone: A/C Pfx Line Extn Contact

Purch: 617 678 7556 0000 Grandpa Kait

Acc Pay: 617 679 4710 0000 It's just "BORIS"

Fax: 617 679 4700 0000

F3=ExitChanges up through MomentF12=Cancel

MA A01/013

1902 - Session successfully started

8:50 PM10/23/2012





Host: 10.10.200.47

Port: 23

Workstation ID:

After changing QDATE to 10/23/12

## Work with System Status

TIMEMACH

10/23/12 20:48:07

```
% CPU used . . . . . : .7
Elapsed time . . . . . : 00:09:36
Jobs in system . . . . . : 4775
% perm addresses . . . . . : .007
% temp addresses . . . . . : .010
```

## Auxiliary storage:

```
System ASP . . . . . : 46.61 G
% system ASP used . . . : 84.1425
Total . . . . . : 46.61 G
Current unprotect used : 2309 M
Maximum unprotect . . . : 2348 M
```

Type changes (if allowed), press Enter.

System Pool	Pool Size (M)	Reserved Size (M)	Max Active	-----DB-----	---Non-DB---		
				Fault	Pages	Fault	Pages
1	308.88	134.30	+++++	.0	.0	1.0	16.1
2	671.07	32.69	36	.3	.9	2.0	6.8
3	555.78	.00	57	.0	.0	.1	.3
4	.25	.00	5	.0	.0	.0	.0

Bottom

## Command

==&gt; CALL PGM(CUSTINQ)

F3=Exit F4=Prompt F5=Refresh F9=Retrieve F10=Restart F12=Cancel  
F19=Extended system status F24=More keys

MA A

21/007

1902 - Session successfully started



