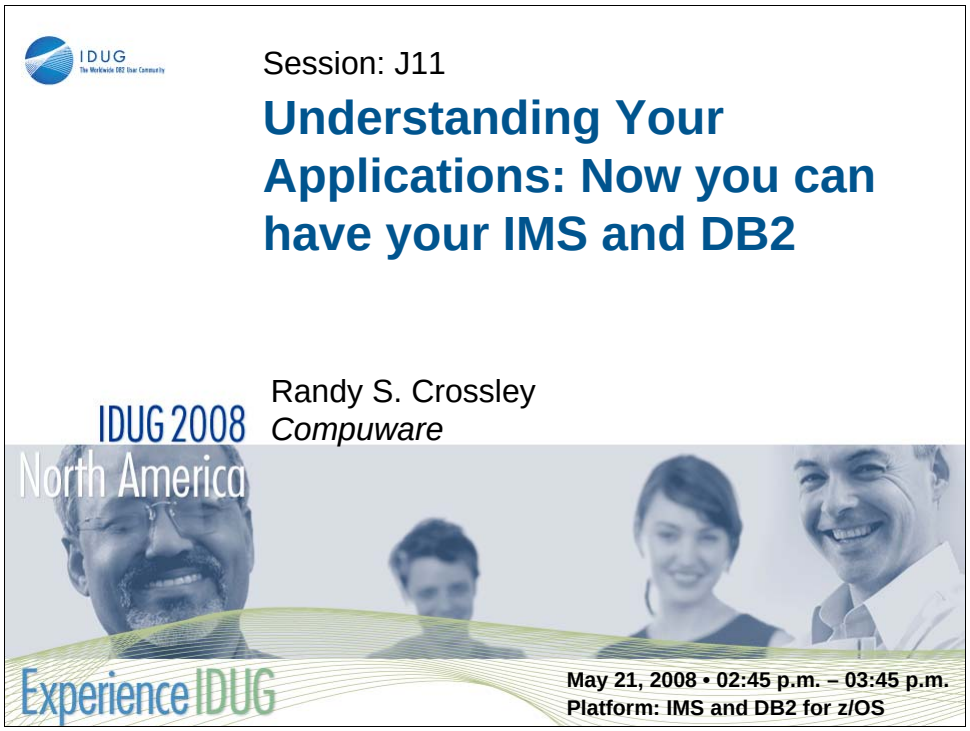
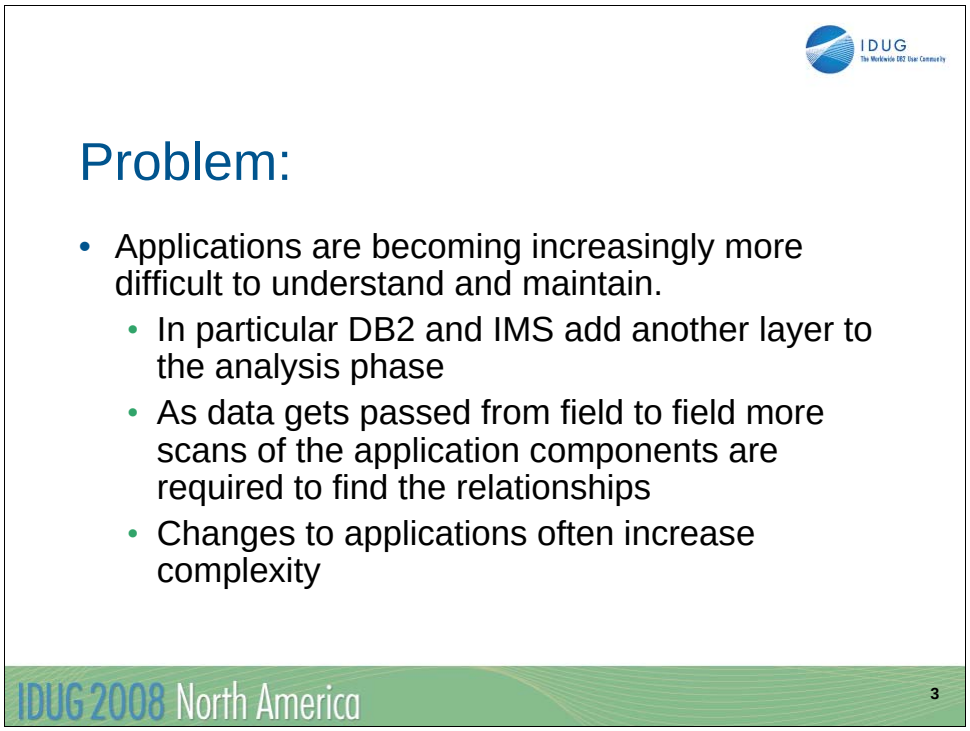


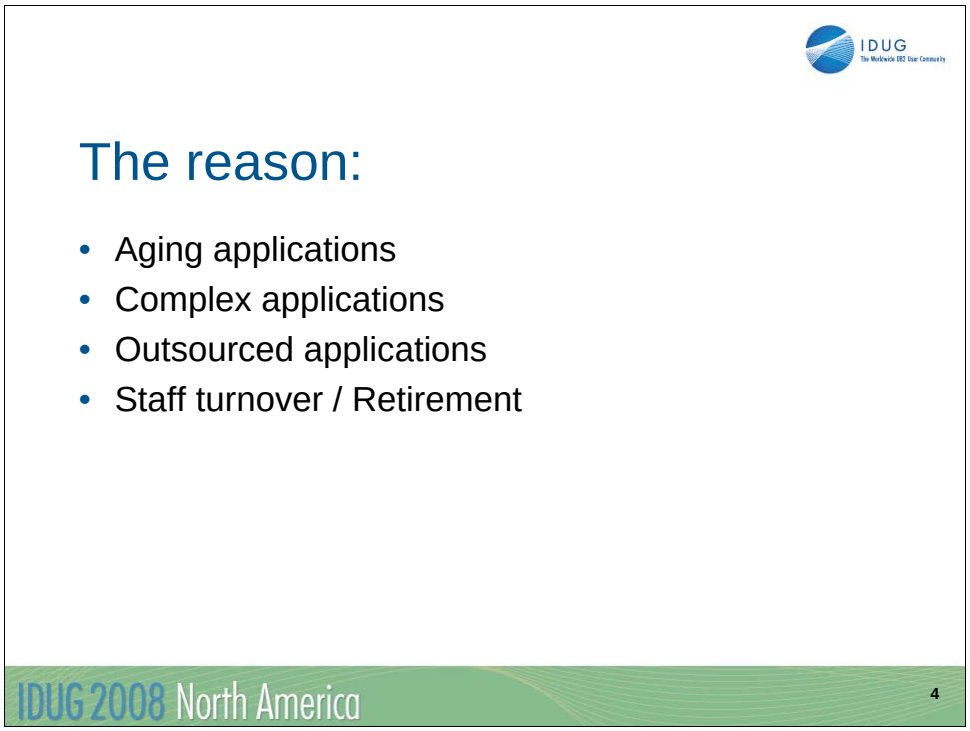
Understanding critical mainframe applications can be difficult. When IMS and DB2 are introduced into the mix, it further complicates this issue. Determining application relationships to and from DB2 and IMS entities becomes particularly difficult. Ever try to trace a DB2 column back to the related program data items? DevEnterprise, along with the recent addition of being able to collect DB2 information, has now introduced improved IMS support. You will now see valuable information on your IMS databases, including PCB and PSB information. For online IMS applications the Transaction to Program relationship will be identified. The Impact analysis function of DevEnterprise can now assist greatly in identifying the application relationships to the DB2 and IMS entities.

Objectives:

- Identifying the inter-relationships of application components
- Producing impact analysis of database fields and columns
- Creating graphical views of the database and application entities
- Base line program complexity
- Identifying code flaws that may potentially affect application quality

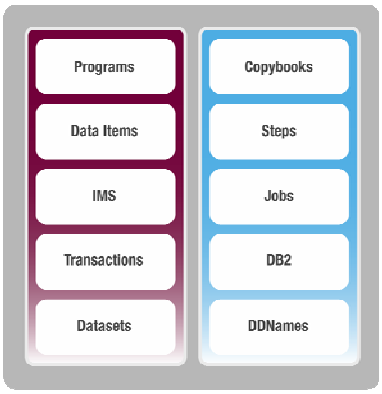


Are you making a simple code change like renaming or expanding a field or changing a DB2 table, and need to know the effect on the other components of your application? Are you building a new application and need to know what data is available? Or do you need to locate potential relationships between data to help with a data migration project? Application relationships are critical to any major maintenance project. Typically identifying these relationships is a tedious and manual effort. Often times relationships go un-identified causing production problems. As more changes take place in an application, complexity increases, making an already difficult task even more trying.



There are several reasons contributing to this issue. The combination of aging applications and staff turnover is one major area. Often times those with the most knowledge leave before being able to fully transition that information over.

What makes up your application?

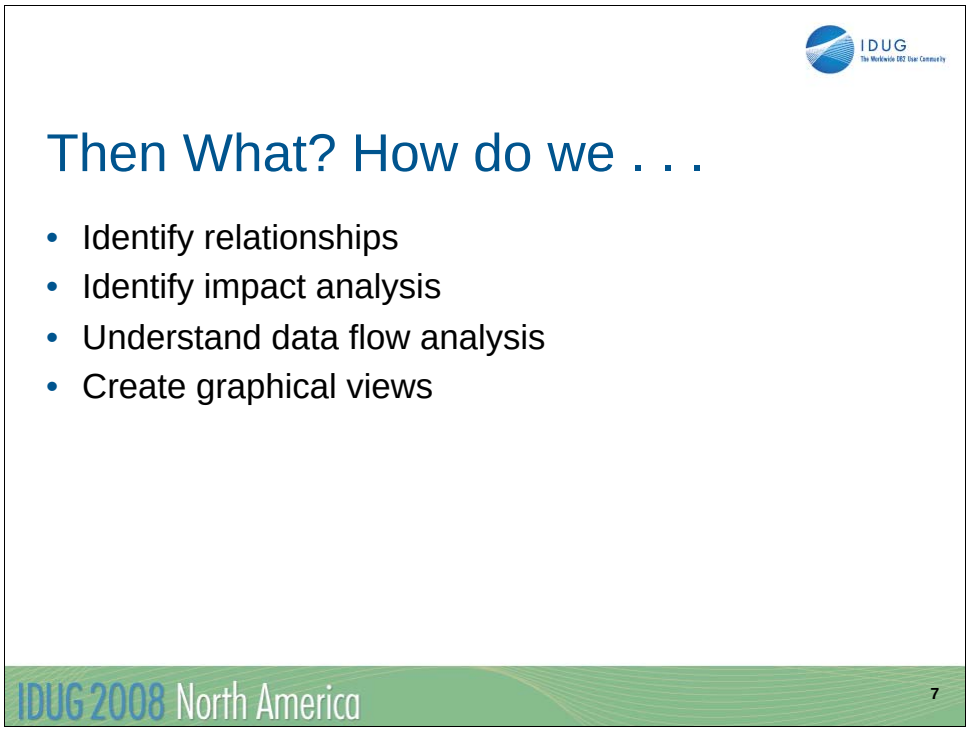


An application is made up of many entities. Is it an online application or batch? Where is the data located? Do I need JCL in addition to the source and copybooks?.

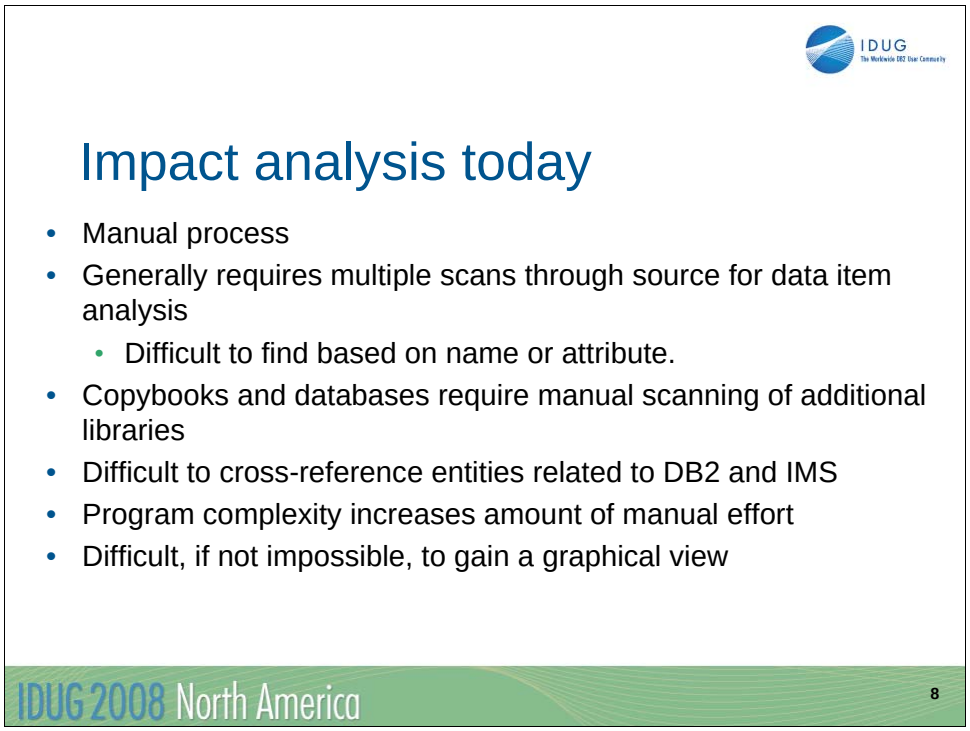
How do we gather this data?

- Scan source libraries.
- Scan JCL and PROCS.
- Review documentation.
- Work with team members to “share” the knowledge.

Who knows where this information is and how do I get to it? These are all questions you need to ask before you even get started with identifying the application relationships.

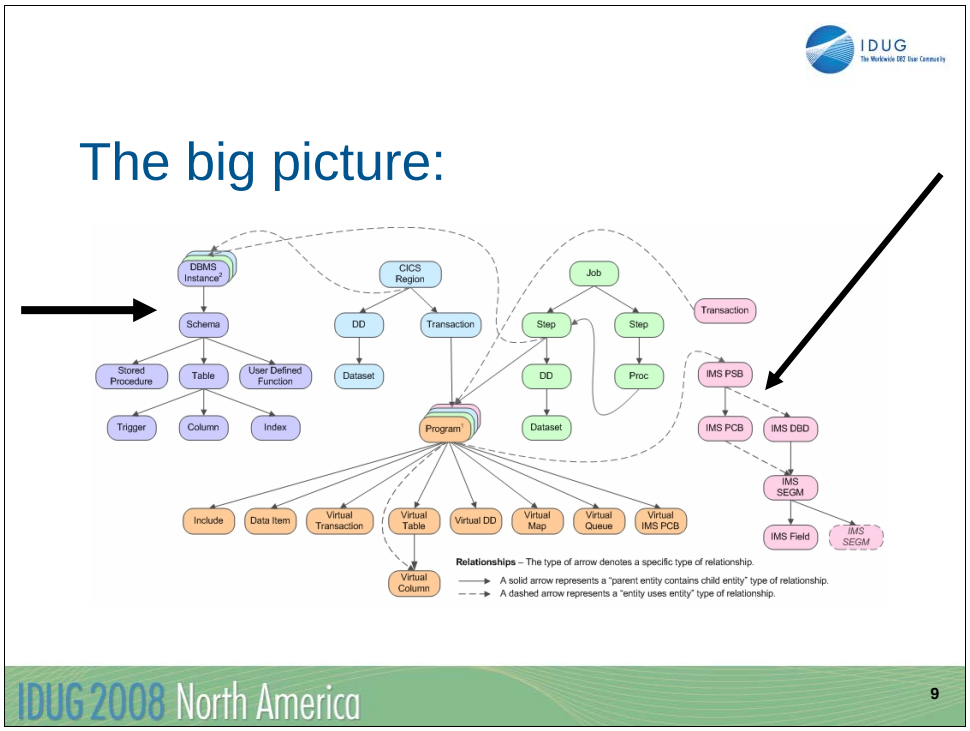


OK, now that we have the information, how do we do the following?



Impact analysis generally requires the scanning of source, copybooks, and databases. It can get very difficult when the name doesn't conform to the item. It might be simple to identify date fields, for example, but not all data names will be as easy to locate.

Because the information is scattered throughout various files (source, database, JCL) the effort to cross reference all information can become very time consuming.

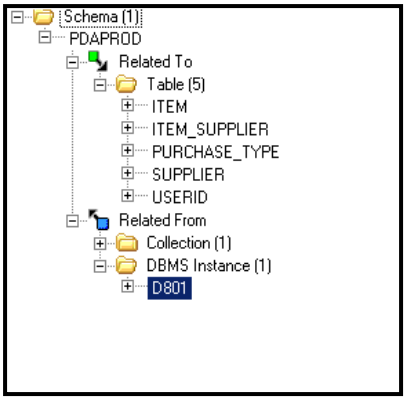


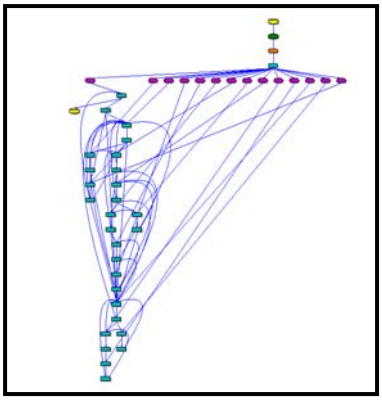
This diagram represents all the possible entities associated with an application. A solid area in this diagram represents a “parent entity contains a child entity” type of relationship. A dashed arrow represents a “entity uses entity” type of relationship.

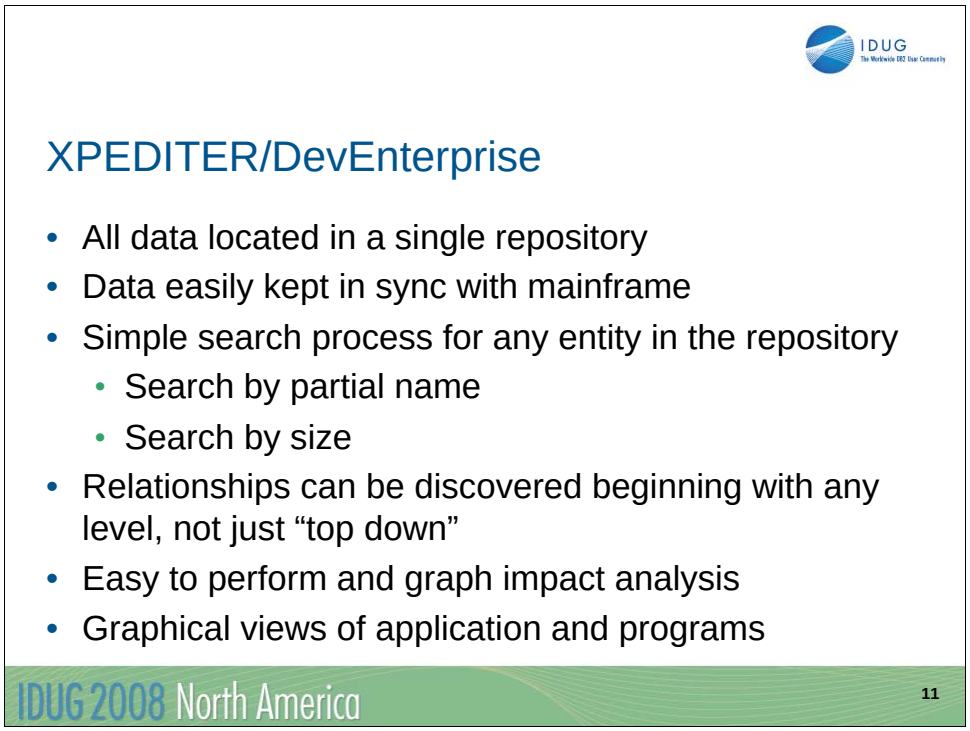
With the Metadata Analyzer, you can collect metadata from all of your batch, CICS, DB2, COBOL, PL/I, IMS, and Assembler applications—automatically, behind the scenes.

Multiple users can simultaneously access the information they each need to determine the impact of changing includes, jobs, Procs, datasets, DB2 columns, fields, etc. . . even if they cross applications!

The solution: DevEnterprise





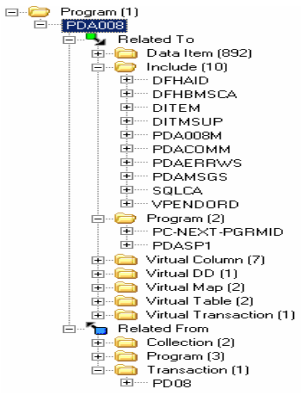


Administrators set up collections to gather metadata, and guest users simply search the repository for metadata that matches what they are looking for. Collections can be automated and setup to only collect data that has been updated since the last collection. This allows to easily keep the repository in sync with the data on the mainframe.

Search’s can be done on partial names or even by the size of the data item.

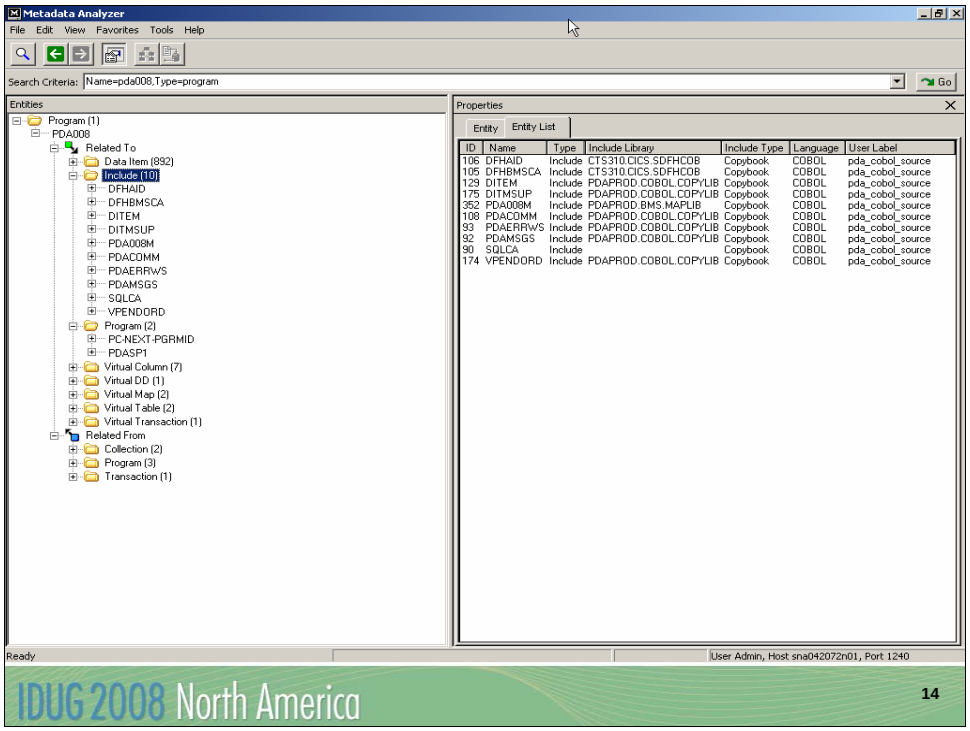
The tree view of an application lets you quickly see how many programs, copybooks, and datasets exist within the application. This information is produced from a “one click” search of the repository.

DevEnterprise: Tree View - Program



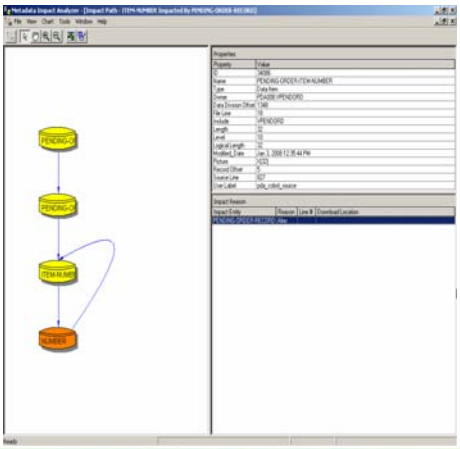
- All relationships displayed in the tree for the program
  - 892 data items
  - 10 copybooks
- Can easily see what copybooks program uses
  - What programs are called from the program
  - What transactions call the program

Expanding the tree lets us see what entities are directly related within the application. For example, I see how many data items and copybooks are related to the program I have expanded. Again, one click, and I now know exactly what copybooks are used by the program.



Selecting an item from the tree produces the “entity list” on the right. I not only what copybooks are used by the program, but I can also see the library the are being called from.

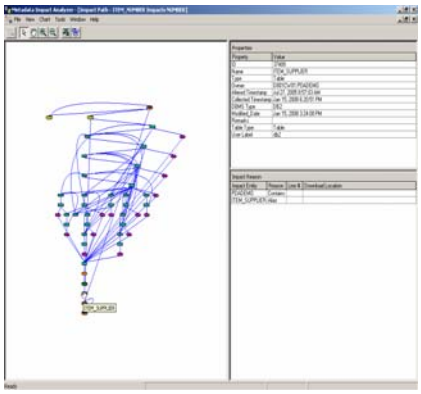
DevEnterprise:
Impact Analysis- Tracing a data item



- Graphical flow of data item to data item
- Able to see impact of alias related to data item
- Can bring up source and see it in context

What will be impacted if I change this DB2 Column or Data Item?

DevEnterprise:
Impact Analysis- Tracing a column



- Simple to see what data items can be impacted by a change to a DB2 column
- How would you identify this flow without DevEnterprise?

Graphical view of the impact analysis of a DB2 Column.

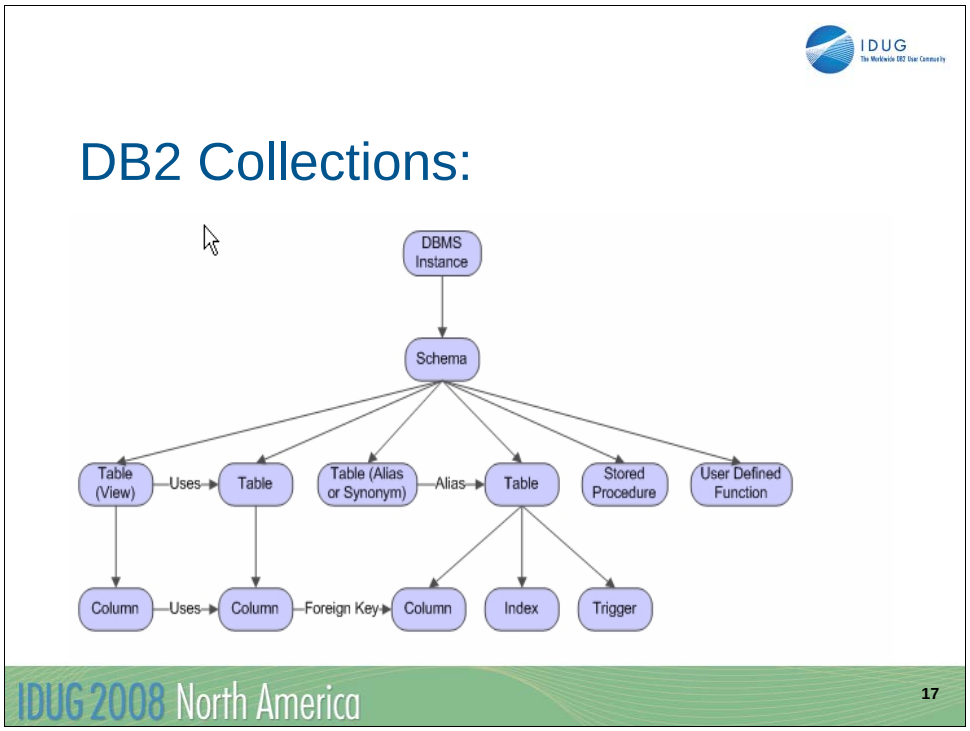
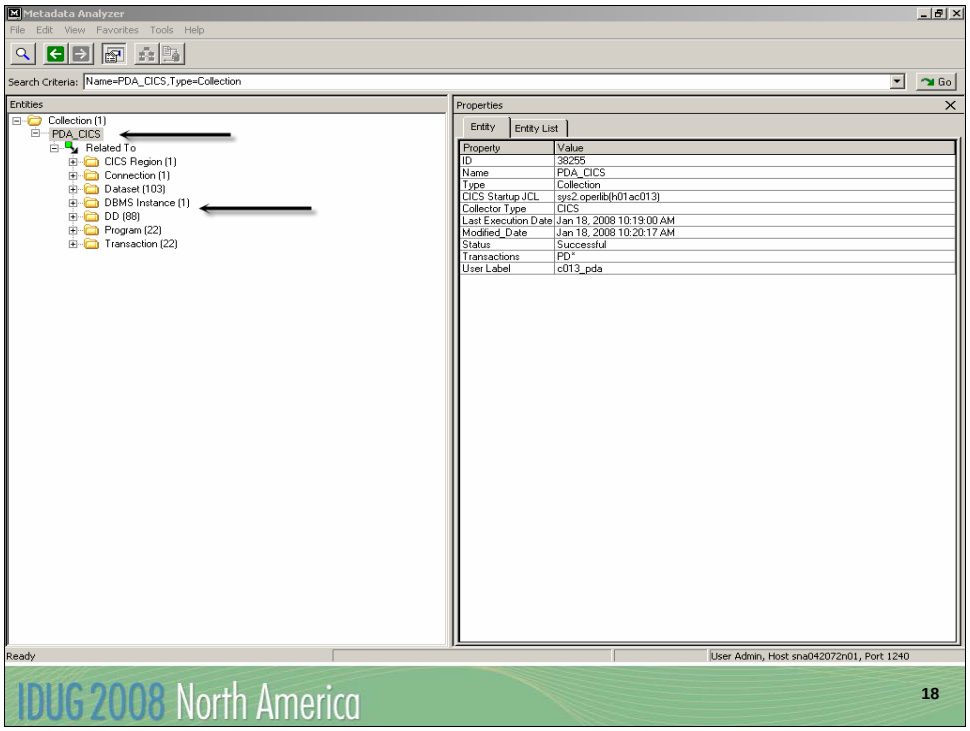
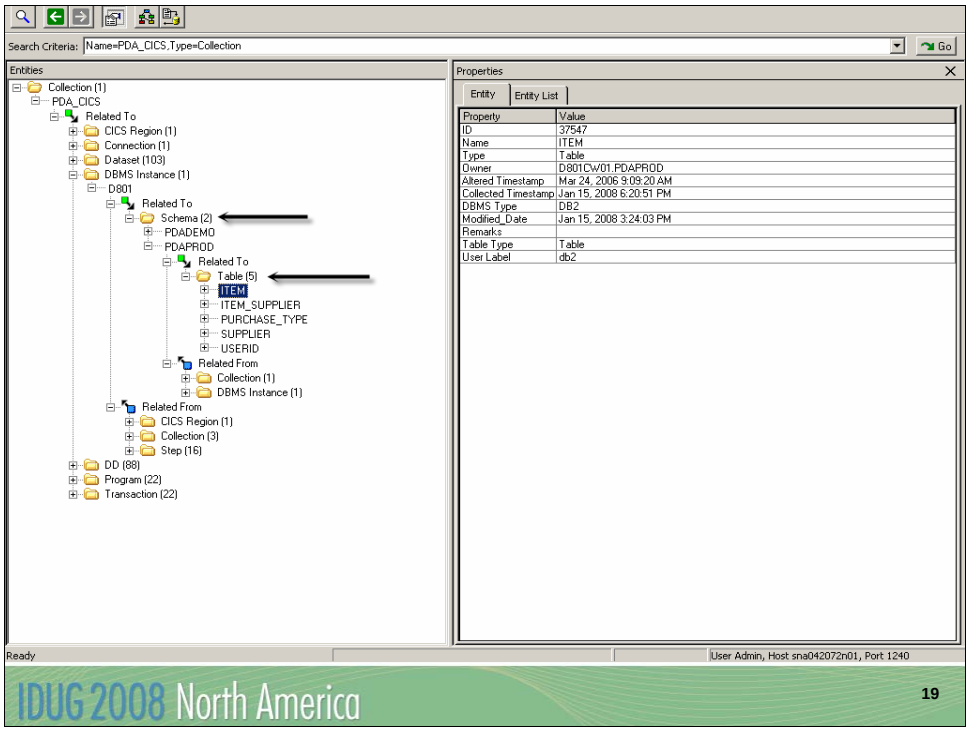


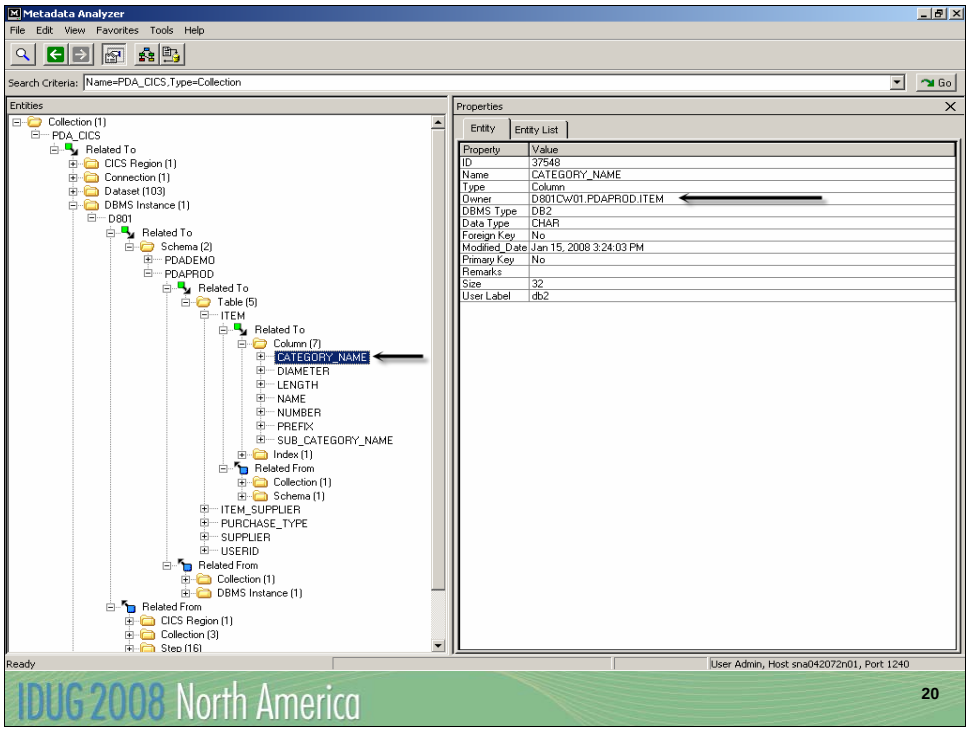
Diagram of DB2 relationships. The instance represents the DB2 subsystem to be collected.



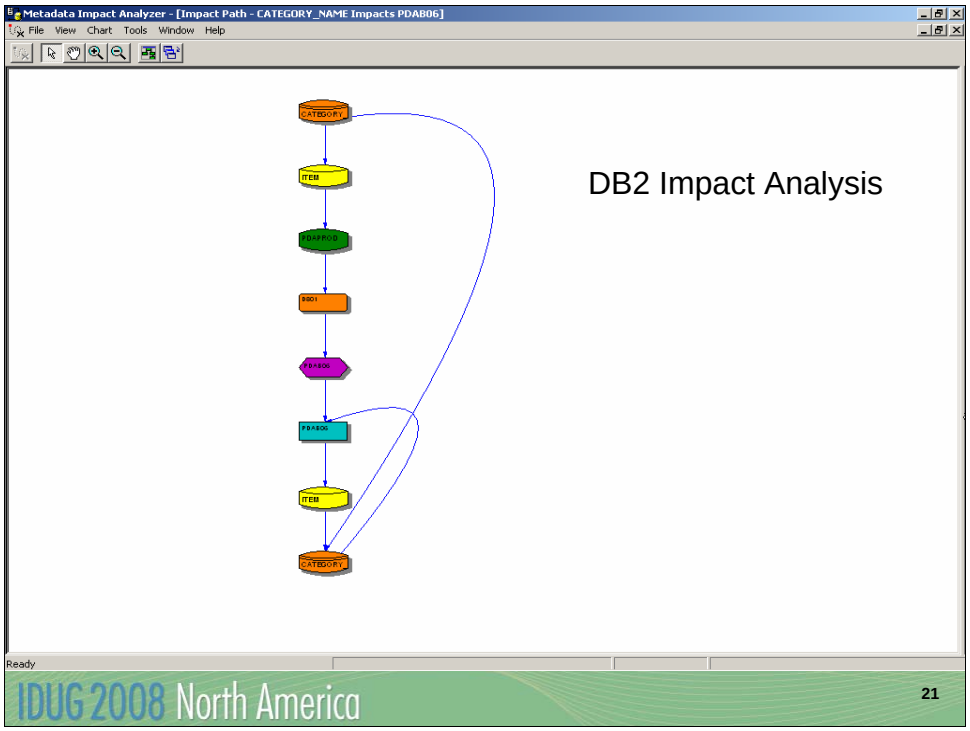
Another one click search on the DB2 collection produces the tree view of the DB2 entities.



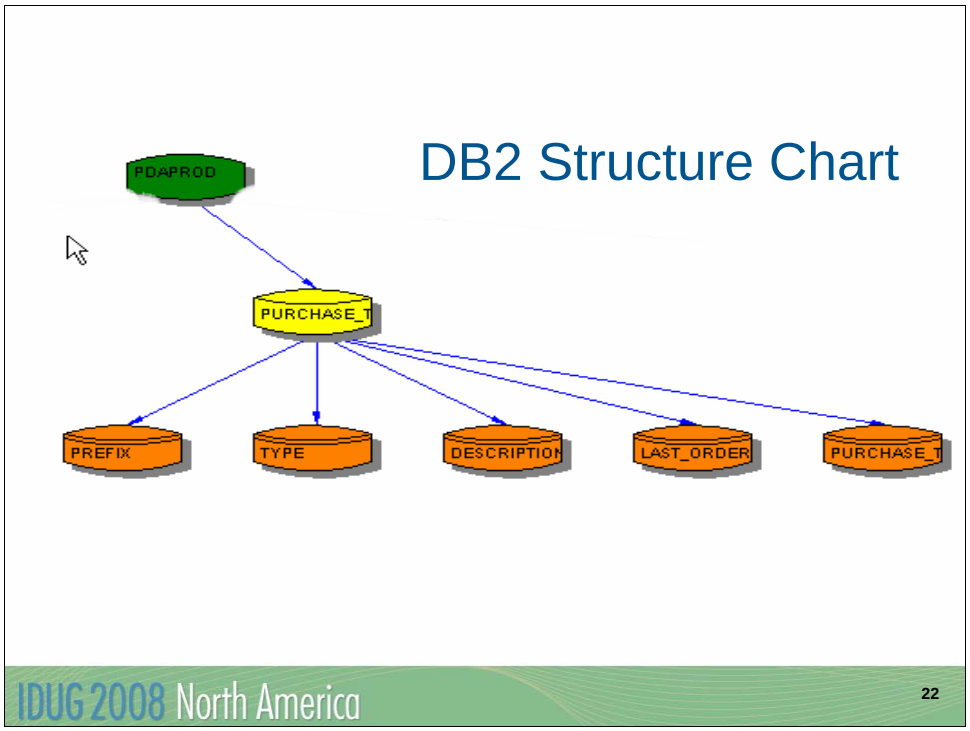
Expanding the tree to view the related entities.



Further expanding down to the COLUMN level. The entity list allows us to see owning or “parent” entity.



Taking it a step further. Producing impact analysis on the column lets us see a graphical flow from COLUMN to the PROGRAM.



Example of DB2 structire chart on a SCHEMA name showing TABLE and COLUMNS.

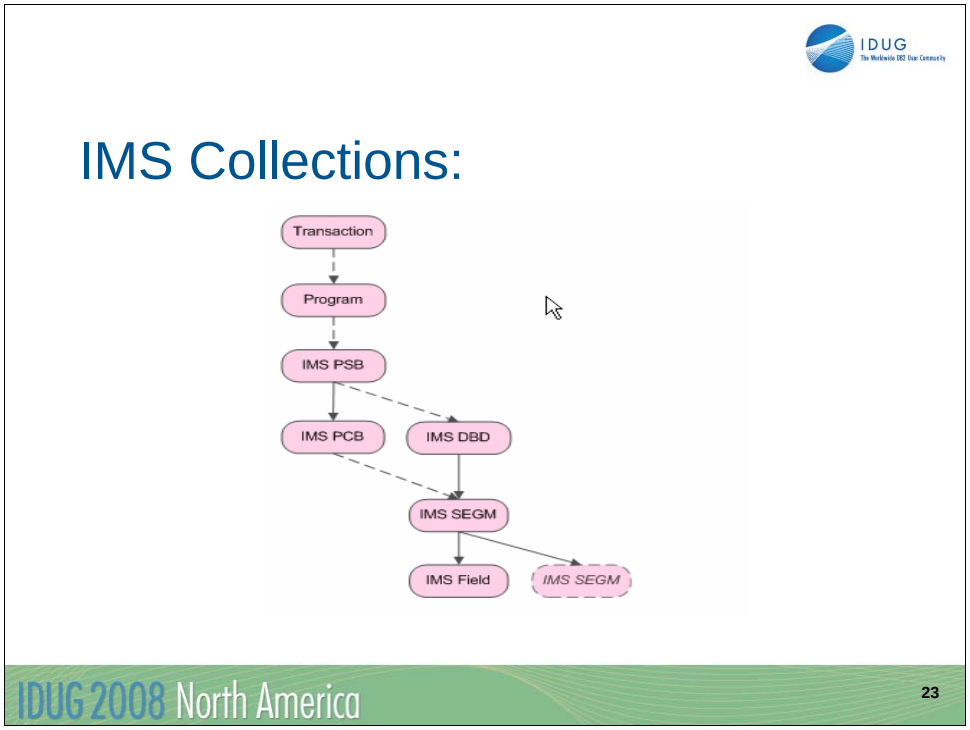
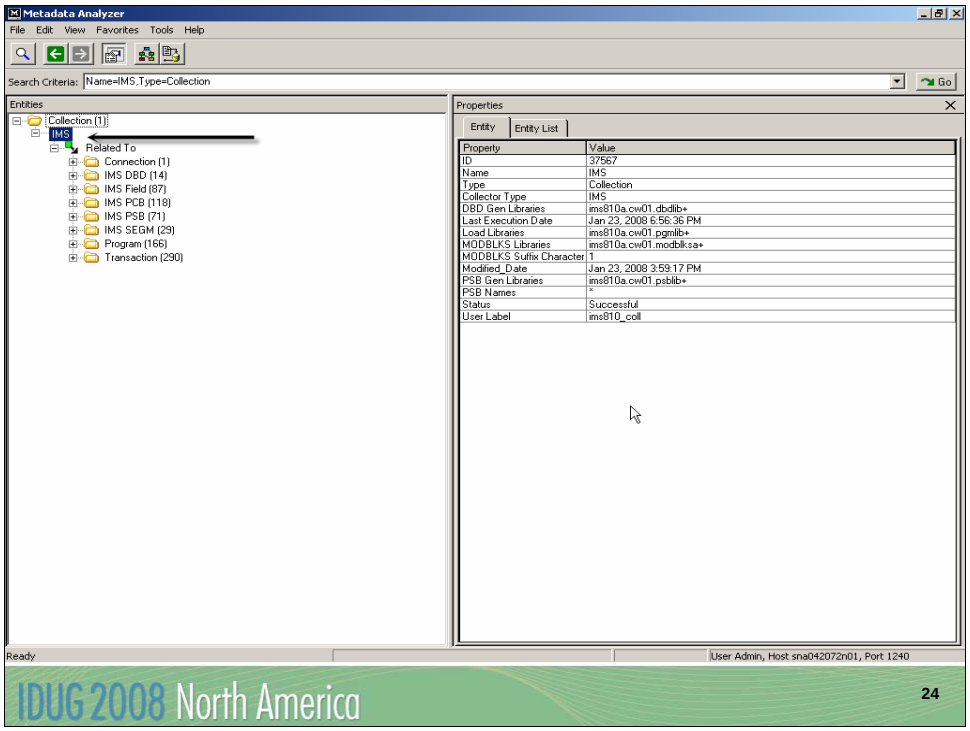
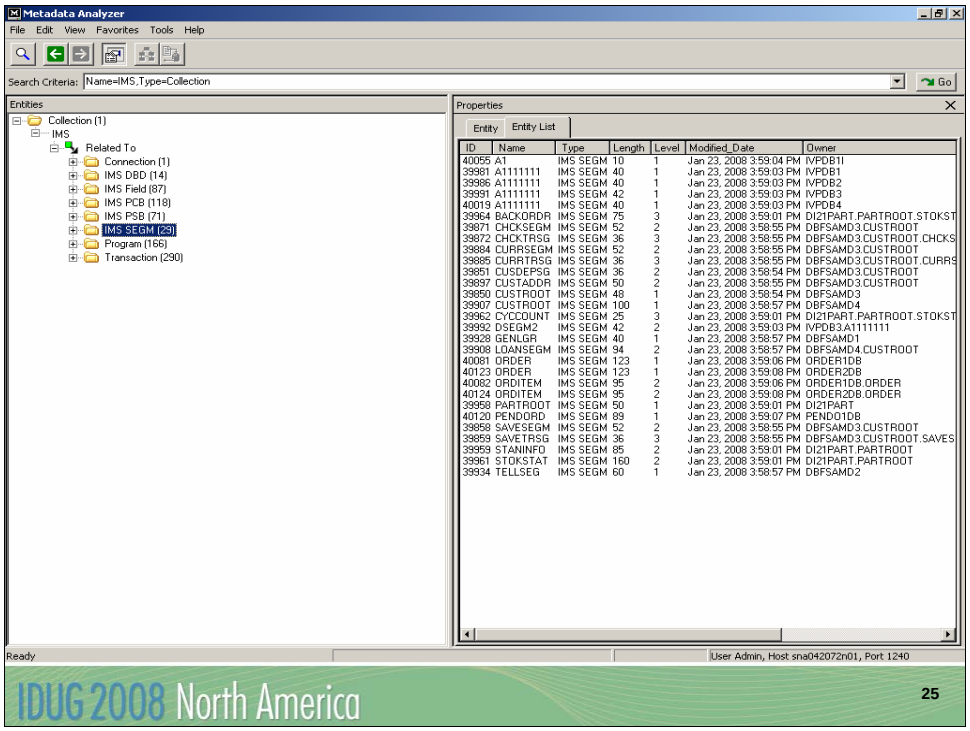


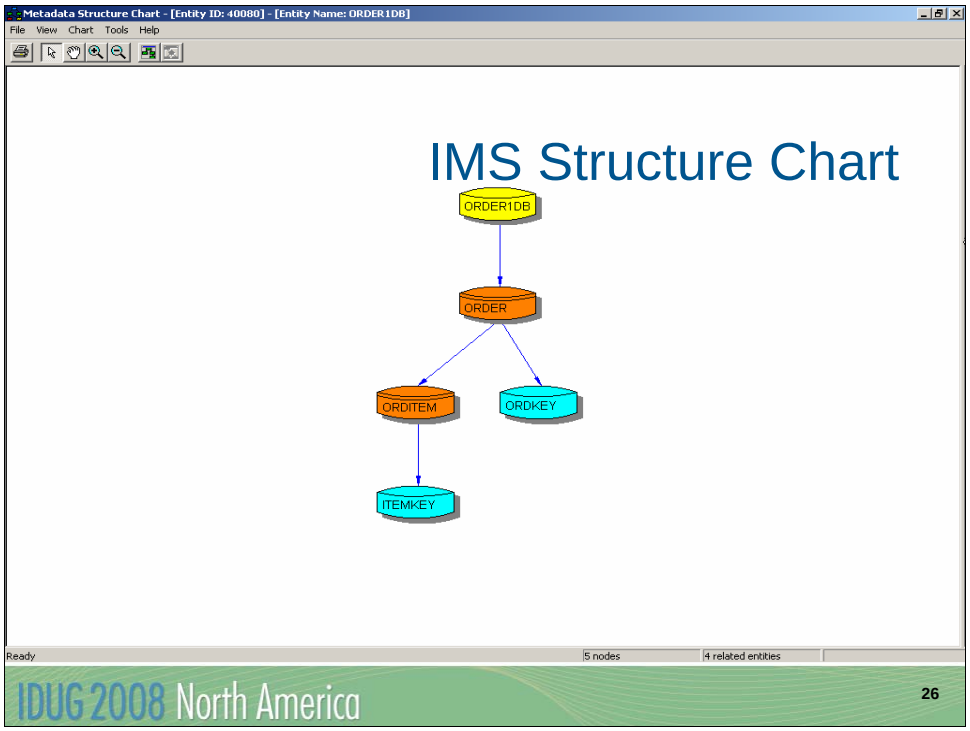
Diagram of IMS relationships.



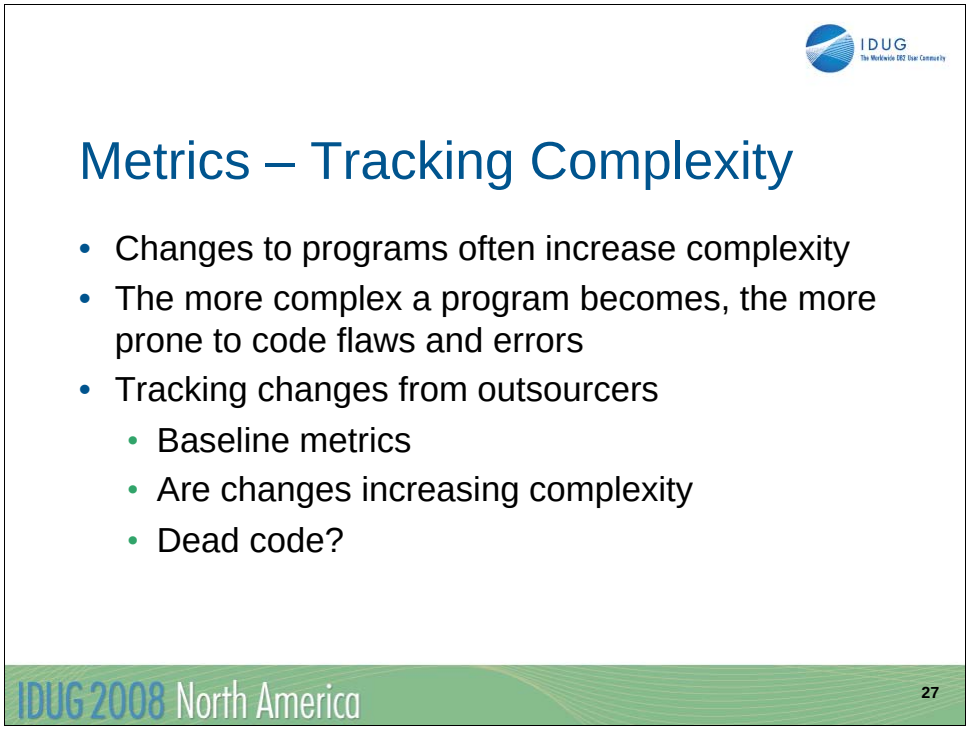
Another one click search on the IMS collection produces the tree view of the IMS entities.



Selecting the SEGMENT entity produces the entity list on the right. Easy to see each SEGMENT name on the owning IMS DBD.



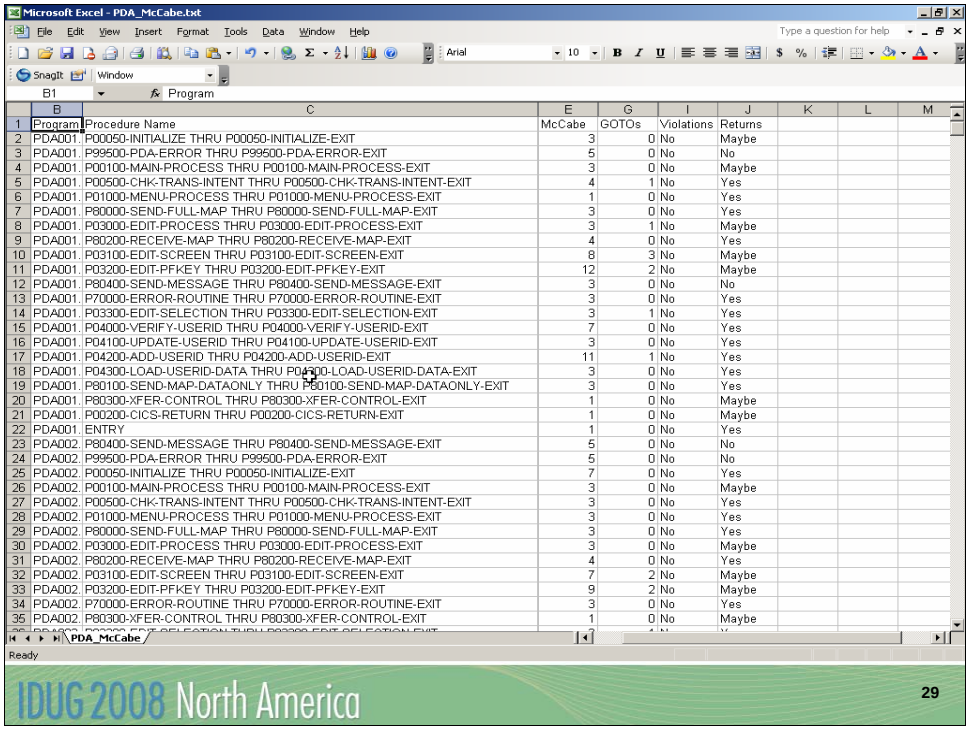
Example of IMS structure chart.



Advantages of tracking metrics.

DevEnterprise: Metrics - McCabe

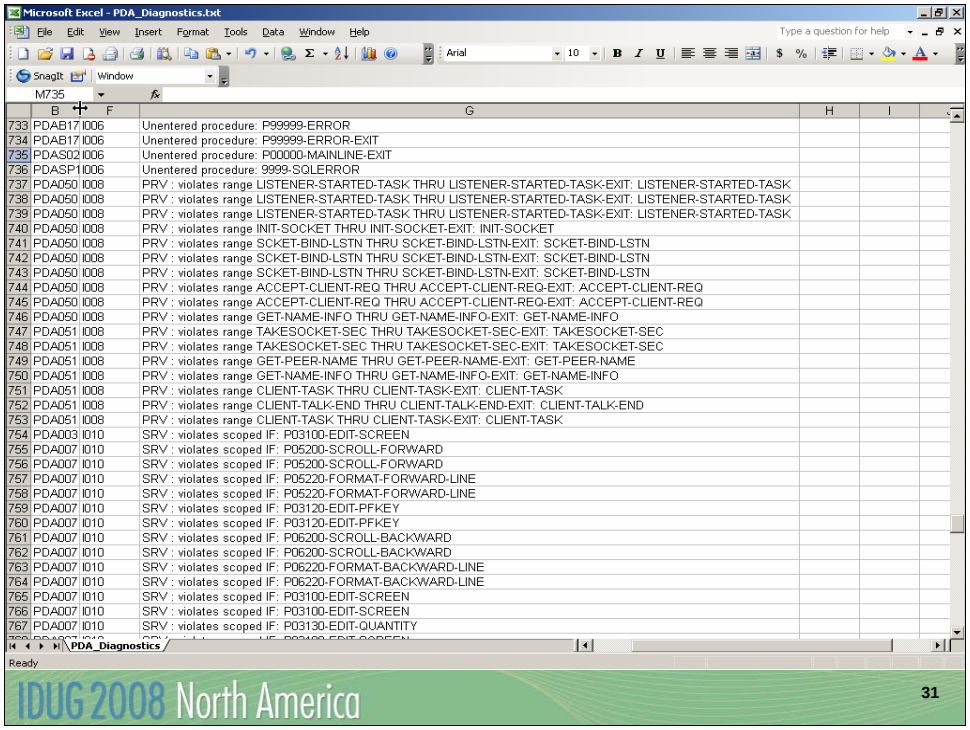
- Base line current complexity of individual program
- Track changes to code for increased complexity
- If outsourced, are you getting optimal coding for you cost?
- Quality gates: Are they being met?



Program	Procedure Name	McCabe	GOTOs	Violations	Returns
PDA001	P00050-INITIALIZE THRU P00050-INITIALIZE-EXIT	3	0	No	Maybe
PDA001	P99500-PDA-ERROR THRU P99500-PDA-ERROR-EXIT	5	0	No	No
PDA001	P00100-MAIN-PROCESS THRU P00100-MAIN-PROCESS-EXIT	3	0	No	Maybe
PDA001	P00500-CHK-TRANS-INTENT THRU P00500-CHK-TRANS-INTENT-EXIT	4	1	No	Yes
PDA001	P01000-MENU-PROCESS THRU P01000-MENU-PROCESS-EXIT	1	0	No	Yes
PDA001	P80000-SEND-FULL-MAP THRU P80000-SEND-FULL-MAP-EXIT	3	0	No	Yes
PDA001	P03000-EDIT-PROCESS THRU P03000-EDIT-PROCESS-EXIT	3	1	No	Maybe
PDA001	P80200-RECEIVE-MAP THRU P80200-RECEIVE-MAP-EXIT	4	0	No	Yes
PDA001	P03100-EDIT-SCREEN THRU P03100-EDIT-SCREEN-EXIT	8	3	No	Maybe
PDA001	P03200-EDIT-PFKEY THRU P03200-EDIT-PFKEY-EXIT	12	2	No	Maybe
PDA001	P80400-SEND-MESSAGE THRU P80400-SEND-MESSAGE-EXIT	3	0	No	No
PDA001	P70000-ERROR-ROUTINE THRU P70000-ERROR-ROUTINE-EXIT	3	0	No	Yes
PDA001	P03300-EDIT-SELECTION THRU P03300-EDIT-SELECTION-EXIT	3	1	No	Yes
PDA001	P04000-VERIFY-USERID THRU P04000-VERIFY-USERID-EXIT	7	0	No	Yes
PDA001	P04100-UPDATE-USERID THRU P04100-UPDATE-USERID-EXIT	3	0	No	Yes
PDA001	P04200-ADD-USERID THRU P04200-ADD-USERID-EXIT	11	1	No	Yes
PDA001	P04300-LOAD-USERID-DATA THRU P04300-LOAD-USERID-DATA-EXIT	3	0	No	Yes
PDA001	P80100-SEND-MAP-DATAONLY THRU P80100-SEND-MAP-DATAONLY-EXIT	3	0	No	Yes
PDA001	P80300-XFER-CONTROL THRU P80300-XFER-CONTROL-EXIT	1	0	No	Maybe
PDA001	P00200-CICS-RETURN THRU P00200-CICS-RETURN-EXIT	1	0	No	Maybe
PDA001	ENTRY	1	0	No	Yes
PDA002	P80400-SEND-MESSAGE THRU P80400-SEND-MESSAGE-EXIT	5	0	No	No
PDA002	P99500-PDA-ERROR THRU P99500-PDA-ERROR-EXIT	5	0	No	No
PDA002	P00050-INITIALIZE THRU P00050-INITIALIZE-EXIT	7	0	No	Yes
PDA002	P00100-MAIN-PROCESS THRU P00100-MAIN-PROCESS-EXIT	3	0	No	Maybe
PDA002	P00500-CHK-TRANS-INTENT THRU P00500-CHK-TRANS-INTENT-EXIT	3	0	No	Yes
PDA002	P01000-MENU-PROCESS THRU P01000-MENU-PROCESS-EXIT	3	0	No	Yes
PDA002	P80000-SEND-FULL-MAP THRU P80000-SEND-FULL-MAP-EXIT	3	0	No	Yes
PDA002	P03000-EDIT-PROCESS THRU P03000-EDIT-PROCESS-EXIT	3	0	No	Maybe
PDA002	P80200-RECEIVE-MAP THRU P80200-RECEIVE-MAP-EXIT	4	0	No	Yes
PDA002	P03100-EDIT-SCREEN THRU P03100-EDIT-SCREEN-EXIT	7	2	No	Maybe
PDA002	P03200-EDIT-PFKEY THRU P03200-EDIT-PFKEY-EXIT	9	2	No	Maybe
PDA002	P70000-ERROR-ROUTINE THRU P70000-ERROR-ROUTINE-EXIT	3	0	No	Yes
PDA002	P80300-XFER-CONTROL THRU P80300-XFER-CONTROL-EXIT	1	0	No	Maybe

Code Flaws: Potential “gotcha”

- Identifying potential code flaws to help prevent future issues
- What may seem “ok” today, could be a problem farther down the road.
  - Perform range violations
  - Dead Code
  - Unexecutable Code


Microsoft Excel - PDA_Diagnostics.txt
File Edit View Insert Format Tools Data Window Help
Type a question for help
SnagIt Window
M735
B F G H I
733 PDAB17 I006 Unentered procedure: P99999-ERROR
734 PDAB17 I006 Unentered procedure: P99999-ERROR-EXIT
735 PDAS02 I006 Unentered procedure: P00000-MAINLINE-EXIT
736 PDASP1 I006 Unentered procedure: 9999-SQLERROR
737 PDA050 I008 PRV : violates range LISTENER-STARTED-TASK THRU LISTENER-STARTED-TASK-EXIT: LISTENER-STARTED-TASK
738 PDA050 I008 PRV : violates range LISTENER-STARTED-TASK THRU LISTENER-STARTED-TASK-EXIT: LISTENER-STARTED-TASK
739 PDA050 I008 PRV : violates range LISTENER-STARTED-TASK THRU LISTENER-STARTED-TASK-EXIT: LISTENER-STARTED-TASK
740 PDA050 I008 PRV : violates range INIT-SOCKET THRU INIT-SOCKET-EXIT: INIT-SOCKET
741 PDA050 I008 PRV : violates range SCKET-BIND-LSTN THRU SCKET-BIND-LSTN-EXIT: SCKET-BIND-LSTN
742 PDA050 I008 PRV : violates range SCKET-BIND-LSTN THRU SCKET-BIND-LSTN-EXIT: SCKET-BIND-LSTN
743 PDA050 I008 PRV : violates range SCKET-BIND-LSTN THRU SCKET-BIND-LSTN-EXIT: SCKET-BIND-LSTN
744 PDA050 I008 PRV : violates range ACCEPT-CLIENT-REQ THRU ACCEPT-CLIENT-REQ-EXIT: ACCEPT-CLIENT-REQ
745 PDA050 I008 PRV : violates range ACCEPT-CLIENT-REQ THRU ACCEPT-CLIENT-REQ-EXIT: ACCEPT-CLIENT-REQ
746 PDA050 I008 PRV : violates range GET-NAME-INFO THRU GET-NAME-INFO-EXIT: GET-NAME-INFO
747 PDA051 I008 PRV : violates range TAKESOCKET-SEC THRU TAKESOCKET-SEC-EXIT: TAKESOCKET-SEC
748 PDA051 I008 PRV : violates range TAKESOCKET-SEC THRU TAKESOCKET-SEC-EXIT: TAKESOCKET-SEC
749 PDA051 I008 PRV : violates range GET-PEER-NAME THRU GET-PEER-NAME-EXIT: GET-PEER-NAME
750 PDA051 I008 PRV : violates range GET-NAME-INFO THRU GET-NAME-INFO-EXIT: GET-NAME-INFO
751 PDA051 I008 PRV : violates range CLIENT-TASK THRU CLIENT-TASK-EXIT: CLIENT-TASK
752 PDA051 I008 PRV : violates range CLIENT-TALK-END THRU CLIENT-TALK-END-EXIT: CLIENT-TALK-END
753 PDA051 I008 PRV : violates range CLIENT-TASK THRU CLIENT-TASK-EXIT: CLIENT-TASK
754 PDA003 I010 SRV : violates scoped IF: P03100-EDIT-SCREEN
756 PDA007 I010 SRV : violates scoped IF: P05200-SCROLL-FORWARD
756 PDA007 I010 SRV : violates scoped IF: P05200-SCROLL-FORWARD
757 PDA007 I010 SRV : violates scoped IF: P05220-FORMAT-FORWARD-LINE
758 PDA007 I010 SRV : violates scoped IF: P05220-FORMAT-FORWARD-LINE
759 PDA007 I010 SRV : violates scoped IF: P03120-EDIT-PFKEY
760 PDA007 I010 SRV : violates scoped IF: P03120-EDIT-PFKEY
761 PDA007 I010 SRV : violates scoped IF: P06200-SCROLL-BACKWARD
762 PDA007 I010 SRV : violates scoped IF: P06200-SCROLL-BACKWARD
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764 PDA007 I010 SRV : violates scoped IF: P06220-FORMAT-BACKWARD-LINE
765 PDA007 I010 SRV : violates scoped IF: P03100-EDIT-SCREEN
766 PDA007 I010 SRV : violates scoped IF: P03100-EDIT-SCREEN
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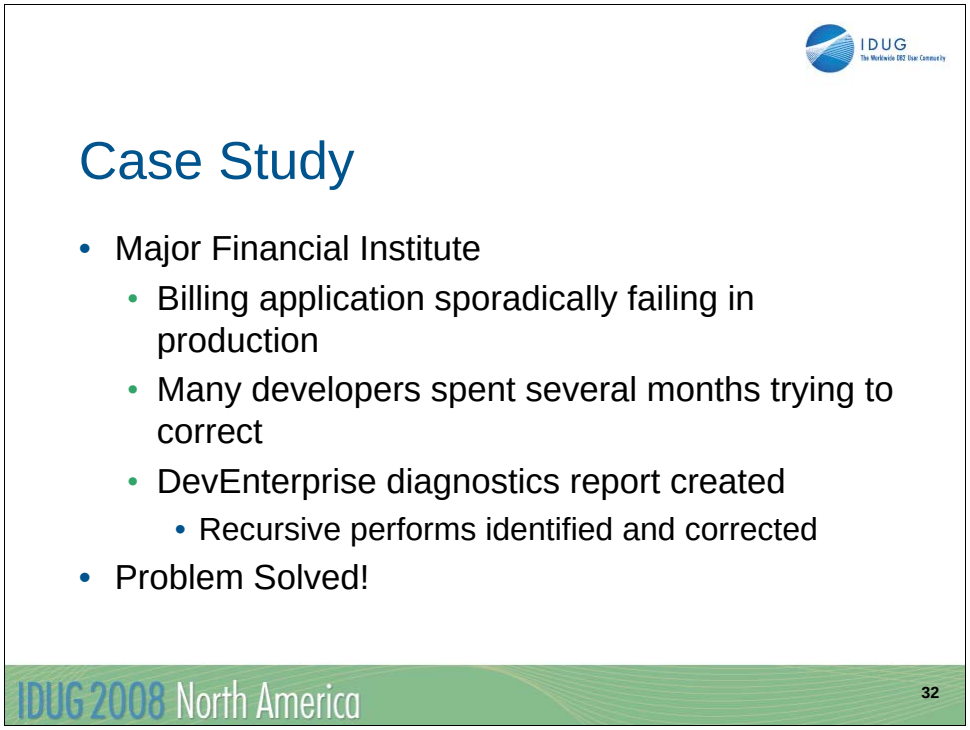
PDA_Diagnostics
Ready
IDUG 2008 North America
31



Would like to close with a case study regarding the value of metrics.

IDUG
The Worldwide DB2 User Community

Questions???

Productivity Gains

- Reduced manual effort
- Repository dynamically synchronized with mainframe
- Relationships are maintained in repository
- Programmers work independently
- Reduced cost / mips
- Hard dollar savings

Session J11

Understanding Your Applications: Now you can have your IMS and DB2

Randy Crossley

Compuware

Randy.Crossley@compuware.com