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Connecting the dots… identifying business unit drivers (mainframe)

and using them for capacity planning!

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SHARE in Boston

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Prelude

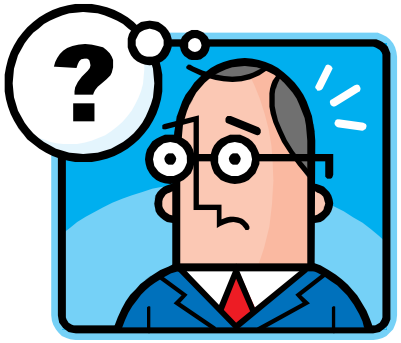
- This is somewhat technical –
  - Primarily mainframe / z/OS oriented presentation
  - Some twists for distributed => z/OS measurement
  - Not all-inclusive – mainframe data has too much, too far-sweeping for a ~45 minute session
  - Like the BBC World Service states = *“The main points, once again…”*

Questions… ???

- Problems with isolating work along lines of business?
- Where is it coming from?
- Who's / what's causing it to occur?
- What impact does it have on z/OS capacity and tuning?

More questions …???

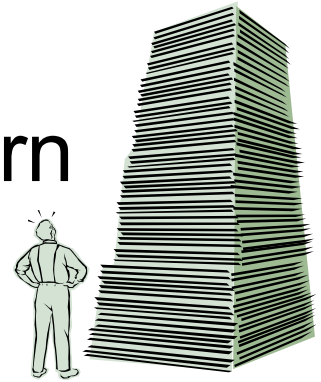
- Subsystems
  - IMS
  - CICS
  - DB2
  - MQSeries
  - WebSphere
- Distributed links
  - DDF, Application Directed Activity, or APPDIRAC



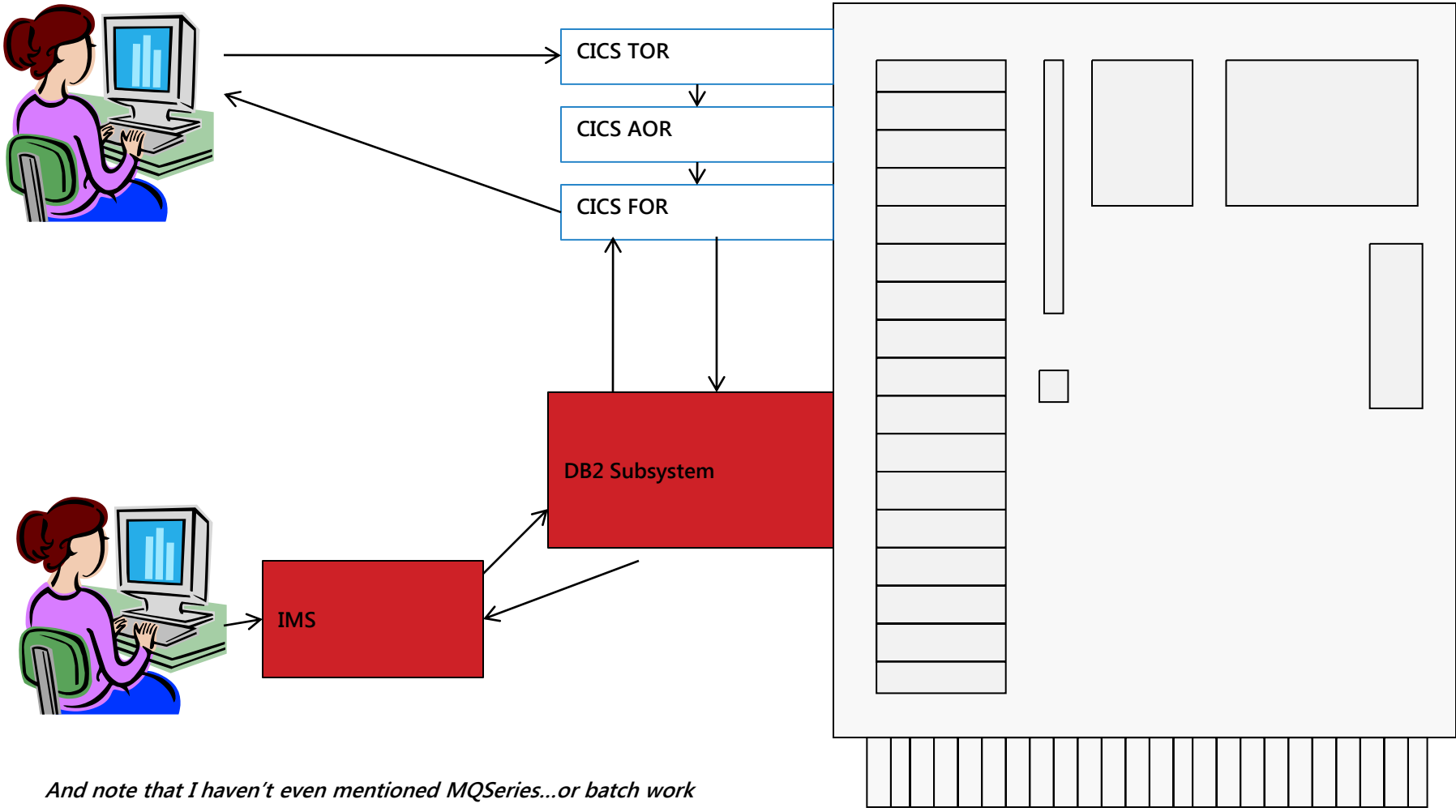
Adding to the mix….

There's an overwhelming amount of raw data …

… and a major effort's needed to turn it into some useful *INFORMATION !*

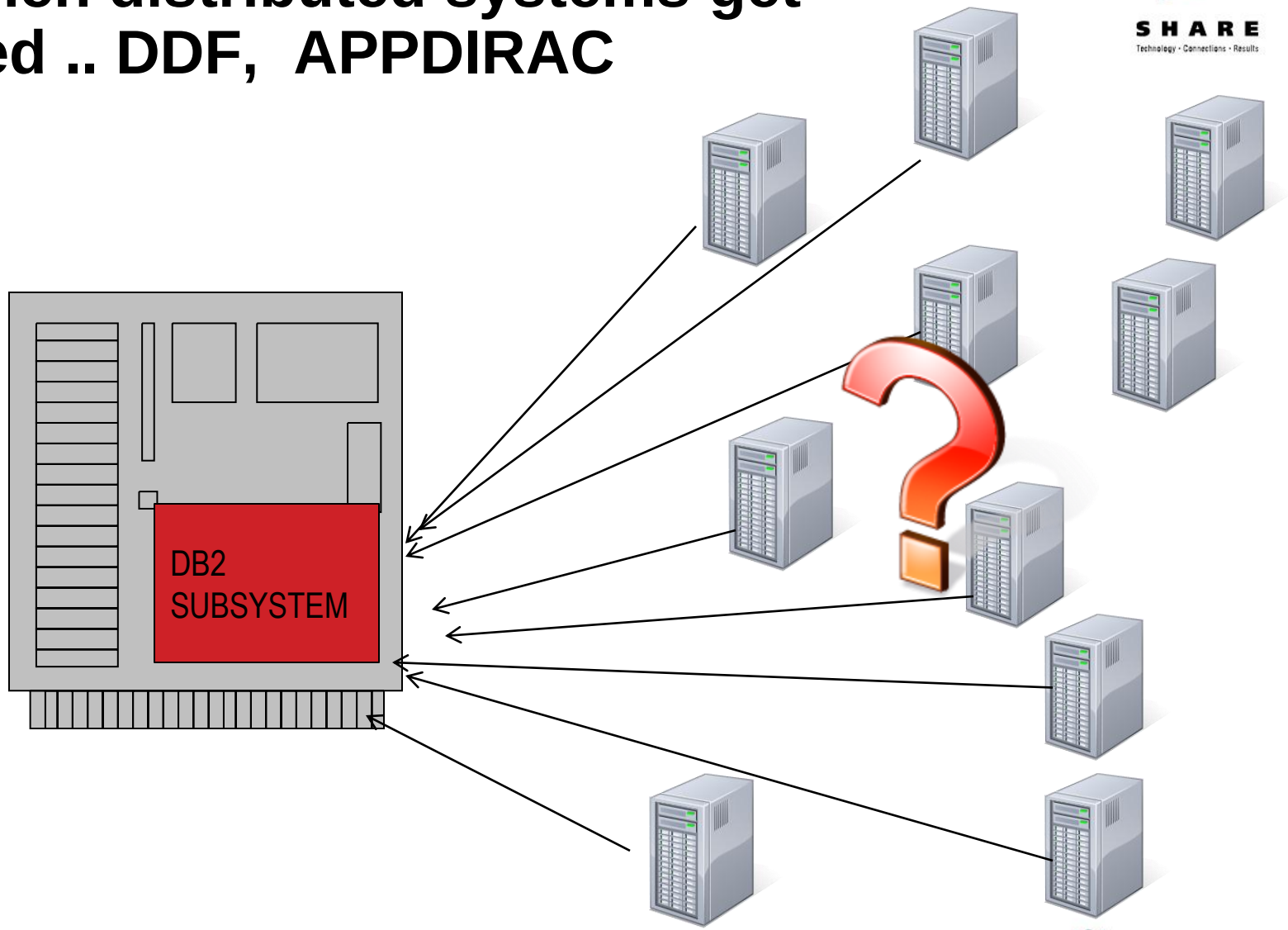


To start… on z/OS alone….



And note that I haven't even mentioned MQSeries…or batch work

And when distributed systems get involved .. DDF, APPDIRAC



Most critical challenges…

- Tying all this subsystem data together to represent normal business work processes

And …

- Identifying the business activities that generate it, and those that they support!

Let’s start to connect the dots

- Data sources that we have available
- Those we must refine, and set parameters for
- Those we must set up in order to exploit

The business objective of connecting the dots in our ocean of data….

Payroll

Human Resources

Manufacturing

Marketing

Finance

Accounting

Performance …

Capacity requirements …

Resource acquisition ….

Shipping

Operations

Sales

****

This can be Multi-faceted

(as can anything else here)

Cost containment !!! !!!!! $$

IS/IT/Telecom

Before I go on ….

You're going to have to sit back and think about this ….

And you're probably going to have to ask some questions …

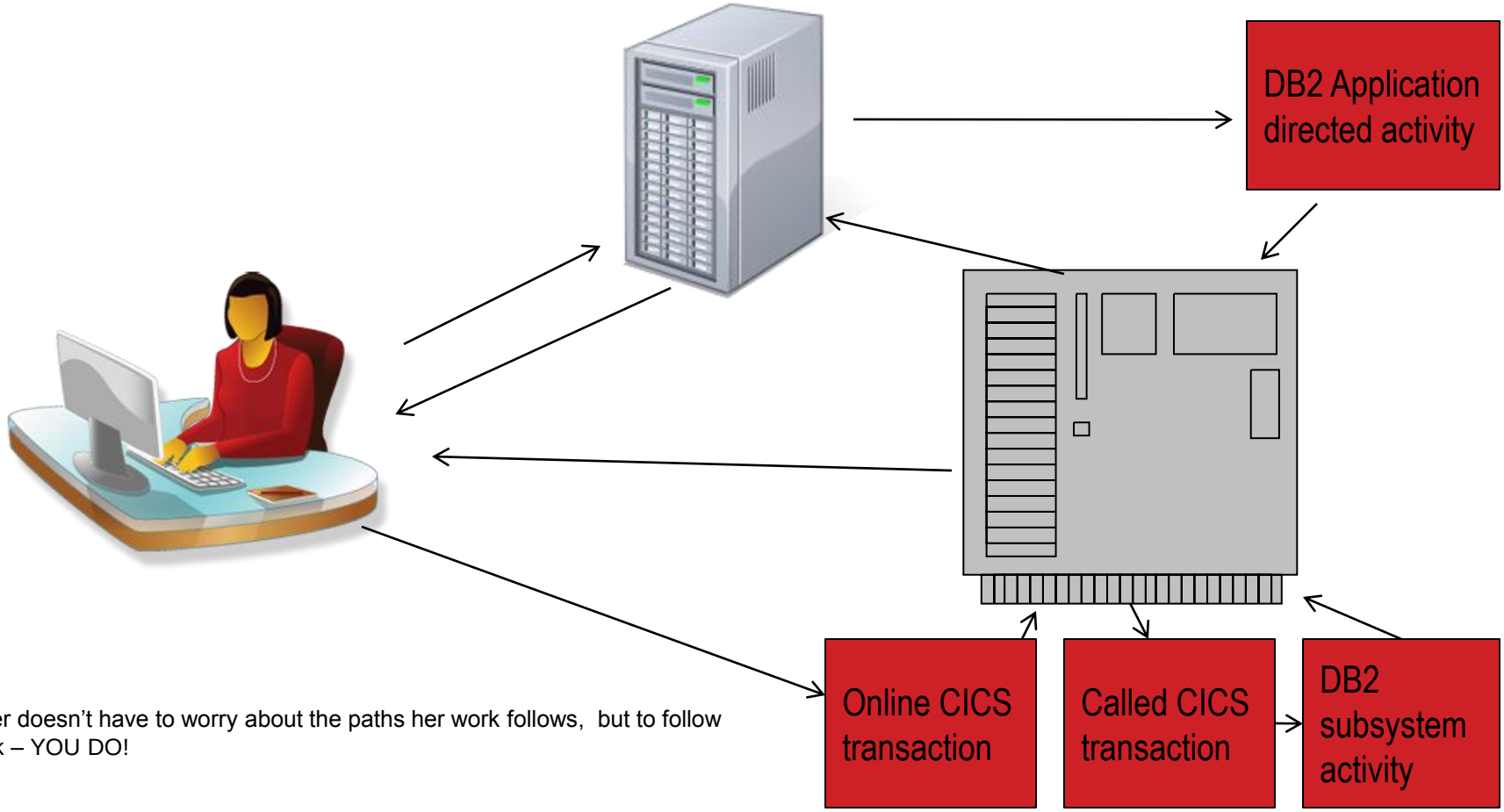
Questions you need to ask

- What are (and aren't) the CRITICAL – "Loved One" applications and business drivers?
- How do they run?
  - High level – systems, platforms
  - Lower levels – subsystems, servers
- Can we identify them?

Connecting the dots ….

- A single transaction – as viewed by the end user – can touch many points
- Users consider a “transaction” to be a single process
- Measurement, capacity planning, and performance analysis requires a horizontal approach --

“But, it’s all ONE transaction, or interaction??”



This user doesn’t have to worry about the paths her work follows, but to follow her work – YOU DO!

Questions you need to ask

- What are the CRITICAL – “Loved One” applications and business drivers?
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First of all , BATCH !

- Easiest to identify, assuming standards are in place
- Many fields that you can use to identify ownership
- Quite simple – Fields in SMF type 30 identification section and usage stats from that record.

Batch

- Categorization can include
  - Account code
  - Submitter
  - Job Name (or part of job name)
  - Initiator class
  - RACFID
  - Service Class
  - Report Class

Next – the subsystems

- CICS
- DB2
- IMS
- MQSeries
- WebSphere

- Remember – some of these CAN and do interconnect -

CICS - high level information

- SMF 30 – region-level activity
  - Critical to have its interval recording active
  - Does not contain individual transactional data
  - CAN be useful if a CICS processing region is dedicated to one line-of-business , or “LOB”

CICS – lower level (transactions)

- Extremely powerful, but some assembly required! Sources include …
  - CMP 110 performance records
  - MainView for CICS
  - The Monitor from Allen Systems Group
- Literally scores of fields to key on!
- Let’s look at some of them …

What's Available?

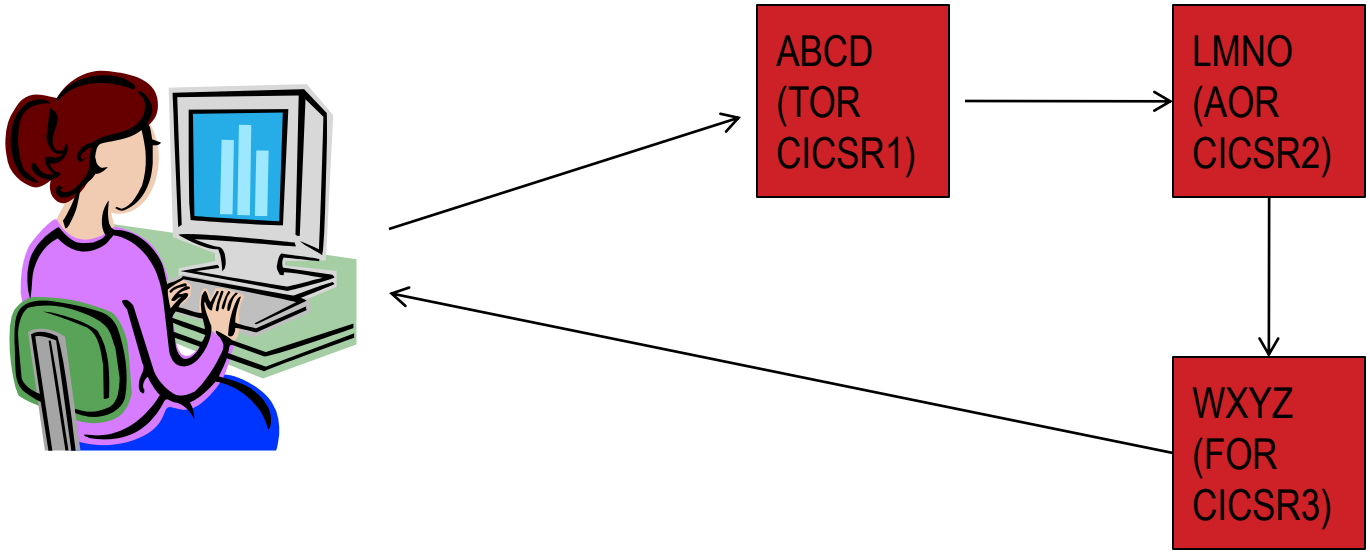
- Just to start –
  - Resources used (CPU, I/O)
  - Response time
  - Calls to other subsystems (more on that)
  - More than enough fields to use as keys to build line-of-business reporting units

Transaction name, terminal it ran on, program name, user-id, special user field, type of transaction, priority, group ID, IP address, server name, remote system ID, 20-40 more depending on input source

MRO – Multi-Region Operation in CICS

- Transactions may trigger other CICS transactions running on other CICS regions
- One transaction can link to another one..
- Here are dots to connect – different transactions triggered by one CICS transaction
- UOWID (in MXG) – Unit of Work ID; composite with UOWIDCHR, UOWTIME

So… an MRO scenario (CICS only)



Simply – as the transaction travels – using the UOWID – link all three together, calculate response times, CPU times, and so forth…

So you've tied it all together – and connected the dots

- What now? Assuming you've identified work by region and transaction (there are other fields)

- Fields for establishing ownership - this is not all of them…
  - The CICS Terminal name
  - The program name executed
  - User-id
  - Special customizable user application field

CICS fields for identifying ownership

- Digging through the CMP 110 – additional fields
  - LUNAME
  - Remote System ID
  - Client ID address

- TMON and MainView for CICS data have other fields that can be used for identifying ownership – consult your manuals

Now – what about CICS calling other subsystems?

- DB2 – most common, most of interest
- MQSeries
- IMS

DB2 requires accounting trace records to be active – they can be voluminous

DB2 SMF transactional information

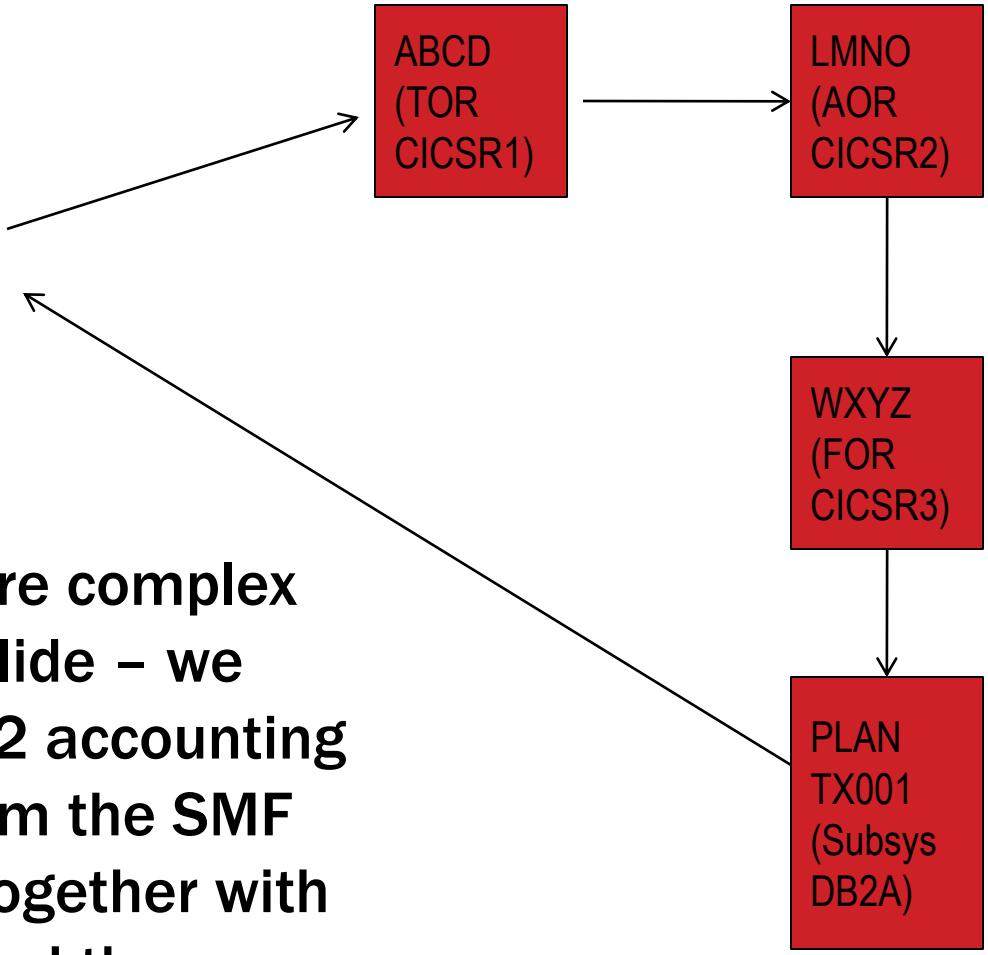
- SMF record type 100
  - System-wide information
- SMF record type 101
  - Transactional detail information
  - A few notes….
  - Reference the START TRACE command

DB2 info --

- Statistics trace for type 100
  - For class 1

- Accounting traces critical
  - SMF 101 account record for DB2
  - For class 1 and 2
  - Package info – class 7 and 8
  - Package buffer info – class 10 (optional)

a scenario (CICS – DB2)



This is a little more complex than a previous slide – we must add the DB2 accounting information – from the SMF 101 – and tie it together with the UOW info found there.

So we tie --

- The UOWID fields from the 110 records for CICS (or TMON or MV/CICS)

- Along with the UOWID fields from the 101 records

  - Adding CPU time, carving response time, and I/O
  - Delineating the two subsystems (performance measurement)
  - Declare ownership of the “transaction” by the CICS transaction

DB2 data – more keys to isolate and identify ownership

- Connection type -
  - 12 different types, including CICS connection
  - If DB2 is called by IMS, CICS, or MQSeries, usually the connection type is set by the caller
  - But there are many fields to determine ownership or classification

Plan, package, correlation id, end user work station, authorization id, CICS connecting transaction, IMS PSB, and others

A review

- CICS transactions that call other CICS transactions
  - UOW fields – link them together, the calling transaction becomes the “head of the chain” and the identifier
- CICS transactions that call DB2
  - The same, match/join/sort on UOW fields

Now what …

- You've asked questions …
  - Who owns the transactions?
  - Is there a way – some other criteria, that makes this transaction / transaction set peculiar to a particular line of business?
- Group them together as "applications"
- Use these applications to drive your capacity plan …

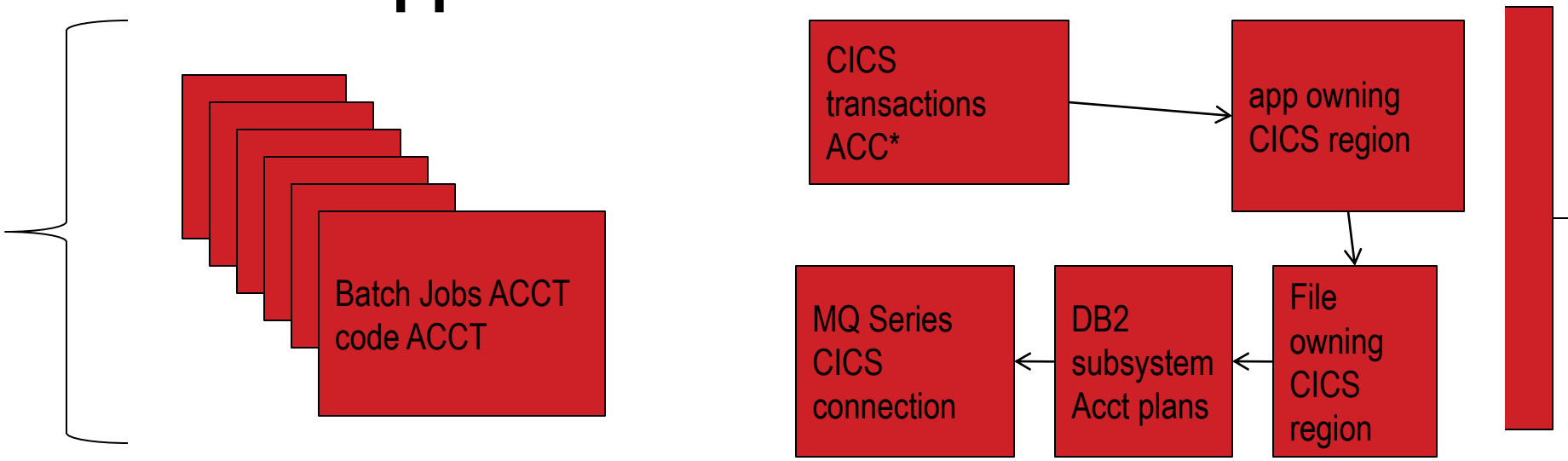
Let's examine a few more…

- CICS-MQ connection

- MQSeries employs SMF 115 & 116 records
  - Seven connection types (similar to DB2)
  - Commonly used fields
    - Correlation-ID
    - CICS Transaction

  - MQSeries has IMS, Channel, Server connections as well

Business Application ACCT



But you might also have IMS activity spawned from CICS – identify these by connection type, PSB or MPP..

You have more dots to connect !

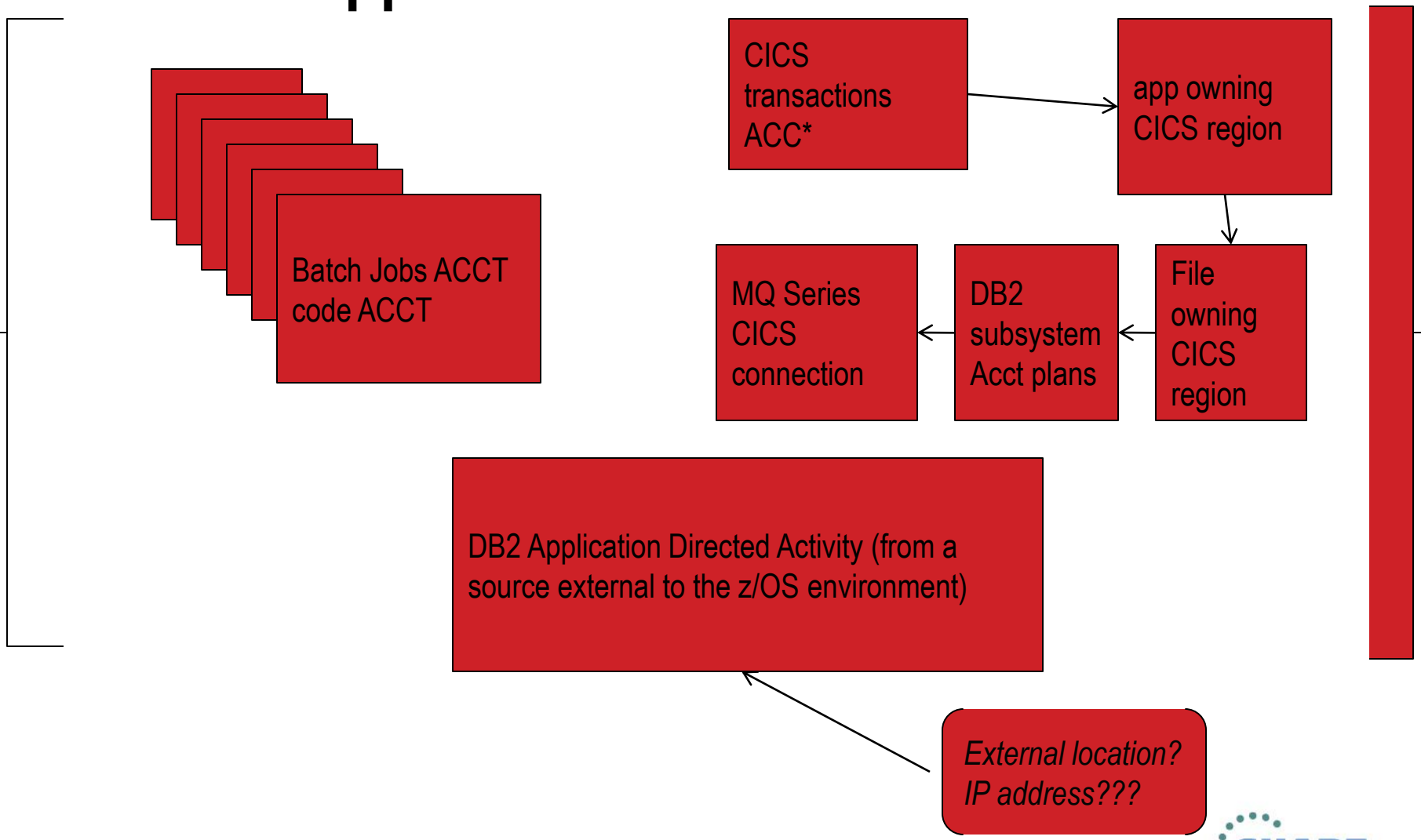
But … DB2 from Distributed Systems?

- SMF 101 record contains “too much”!
  - Connection type = usually APPDIRAC
  - Identifies it quickly, usually has no other connection
  - It comes in “from the outside” of the mainframe

But … DB2 from Distributed Systems?

- SMF 101 record contains many fields
  - Identifiers? – just a small set
    - Correlation-id passed from the requestor
    - End-user id,
    - End user workstation
    - DB2 Operator ID,
    - DB2 Authorization ID
    - Location
    - Plan
    - Package
    - And a compendium of accounting fields

Business Application ACCT



Notes on IMS

- Can be matched to DB2, CICS, MQSeries
- Various key fields available for identification
  - Transaction
  - PSB
  - Class
  - Node
  - Lterm
  - Authorization ID
  - Signon security value
- Matching more difficult – timestamp match

Notes on IMS

- Most common sources of raw input for transactional data =
  - IMS logs
  - Also – MainView for IMS Type x'FA' records

Notes on WebSphere

- Uses SMF type 120 and 121
- No connection via UOWID, solitary
  - J2EE container name and activity
  - Websphere transactional data activity can include =
  - Cell - Node - Server - Instance
- No real “dots to connect” to other subsystems

General notes…

- If you DON'T have a tool in place, start out by matching UOW fields – from different sources.
- You would "work backwards" – the DB2 connection type is CICS, what transaction has a common UOWID, e.g.
- Talk with your applications developers!

General comments

- Make an effort to determine who owns what
  - Better communication within the enterprise
  - Everyone now knows the capacity planner
  - You know your user community

- Inform your communities of their own DP activity
  - They may be surprised
  - Anomaly or expected behavior?

The end result….

- Lines of business are identified
- Subsystem uses are identified within lines of business
- Better grip on resource usage =
  - Better performance
  - More business agility
  - Better resource control & use
  - Improved resource acquisition processes

You won't lose your way……if you do it correctly !!!!!!