Filling the Logical Integration Void

E-Business Enterprise Application Integration Workshop

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Care Data Systems

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Outline (30 minutes)

- What does *Logical* Integration it look like?
- How Serious Is It When it's not Planned For?
- Two Key LIC Standards: Ids and Codes
- Control Strategies for Integrating Identifiers and Codes
- How they fit into data and process integration
- Success Stories
- Conclusions

Current Chart Location Equals <any>   Enterprise ID Equals <any>   First Begins With <an

all Pts by EID - 20 items

ent ID	Name	Birthdate	Designation	SSI	Sex	Enterprise ID
81	JACKMAN, LAWRENCE PAUL	11/11/1930	I		M	P102
71	BAILIFF, NORMAN JEFFREY	07/10/1938	I		M	P103
29	NEESON, STEWART LIAM	09/12/1918	I		M	P104
41	ROURKE, LINDA ROSE	12/30/1916	I		F	P105
47	KENDRICK, LINNE VANICE	12/23/1924	I		F	P106
97	PARKER, RUTH ANNE	11/23/1911	I		F	P107
17	PETERSON, LAVOYCE ANNA	06/03/1962	I		F	P108
99	ROYCE, RICKY LOUIS	07/12/1920	I		F	P109

Timeline: Standard Profile for ROURKE, LINDA ROSE (451641)

Layout   Time Range

1997
January   Febru

Time Scale   Dec 22   Dec 29   Jan 5   Jan 12   Jan 19   Jan 26   Fe

Visits

Reports

Pathology

Pharmacy

Lab
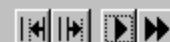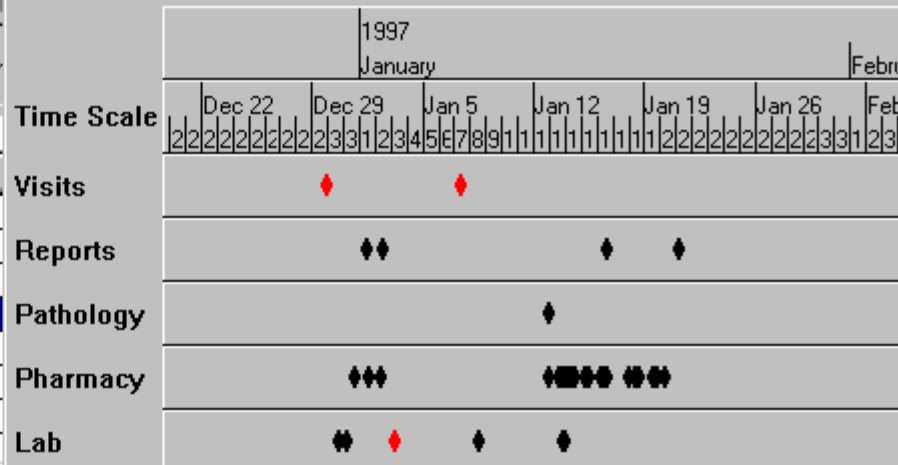
Detail Page...   Attachments...

Ready

Patient Notebook for: ROURKE, LINDA ROSE (451641)

Notebook for: ⦿ Complete Record   ○ Selected Visit

Selected Encounter Info

Patient ID 451641   SSN   Birthdate 12/30/1916

Account # 17396060   Sex F   Admit Date 1/7/97 11:39:00

Name LINDA   ROSE   ROURKE

Admit Type INPATIENT   Address 6473 BRIARCLIFF DR.

Admit Diagnosis AAA ABDOMINAL AORTIC ANEURYSM

Days Since Admit 36.96   WEST POINT   CA   06366

Admit Source PHYSICIAN REFERRAL/   Phone (310)304-5496

                                         Work

Expected Discharge

Discharged?   Date   Emergency

1 of 2

Patient and Selected Visit Info

Contacts   Identifiers   Accesses

Patient
Visit
Insurance
Lab
Pathol
Pharm
Reports
Extras

How Serious?

- In Standalone Systems
- In Integration Projects

Development Methodology Applied to Standalone Developments

- **Project Definition**
- **Analysis and Elaboration**
- **Construction and Refactoring**
- **Testing**
- **Deployment**
- **Party, Promotions, etc.**

Development Methodology Applied to Integration Projects

- **Construction and Refactoring**
  - Discover that not all participants use the same Ids and code sets
  - Discover that nobody will retool or retrain
  - Do some quick and dirty ID mapping by matching traits
  - Add a custom back-end protocol to map order numbers
  - Do some quick and dirty Code mapping by matching terms
- **Testing**
  - Discover unacceptable duplication rates
  - Start a perpetual cleanup project
  - Discover the analysis team can't deal with the disintegrity
- **Deployment**
  - Get sued for wrongly sharing info or amputating wrong guy
  - Examples from Other domains?

Two Key Standard Logical Integration Components

- Person Identification Service
- Terminology Query Service

Standard Component Specs for Healthcare:
The Person Identification Service (PIDS)

- IdMgr
- ProfileAccess
- IdentifyPerson
- IdentityAccess
- SequentialAccess
- CorrelationMgr

- *Find or Register Ids*
- *Get Corresponding IDs*

All Aspects of Person Identifier
Management and Mapping

Standard Component Specs for Healthcare:
The Terminology Query Service (TQS)

- LexExplorer
- CodingSchemeLocator → *Translate Codes*
- ValueDomainLocator
- AdvancedQueryAccess
- CodingSchemeVersion

All Aspects of Codes-and-Terms Mapping

Control Strategies for Integrating Identifiers and Codes

Three general approaches for maintaining integrity of identifiers or codes throughout an arbitrarily large Enterprise
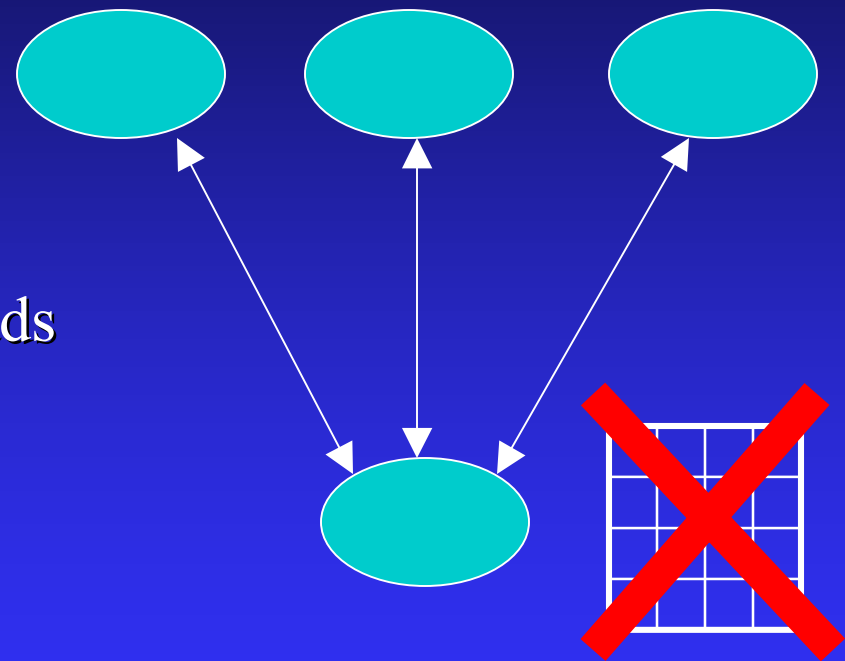
Control Strategies for
Enterprise Identifier and Code Management

- Central Assigner
- Passive Correlation
- Active Correlation

Central Assigner

A Central Manager Manages Ids and codes
in Enterprise-Wide *Canonical* Domains

Each participant
consults the
Assigner for all ads
and updates

Benefits

- Most Elegant! No translations

Limitations

- Requires a change in vendor ego and interfacing. Vendors like their systems to be the "Master" or nothing.

- Requires massive initial cleanup *and* conversion of Ids!

Passive Correlation

Correlates Source Ids and codes based on source profiles with zero effects on sources; Maintains a central cross-reference

Benefits

- Noninvasive - Zero Effects on Sources.

- Maximum autonomy.

- Least Cost

Limitations

- Participants see only the objects they create

- No sharing of "state" across the participants' workpiece instances

- Excellent for ODS architecture but useless for workflow integration
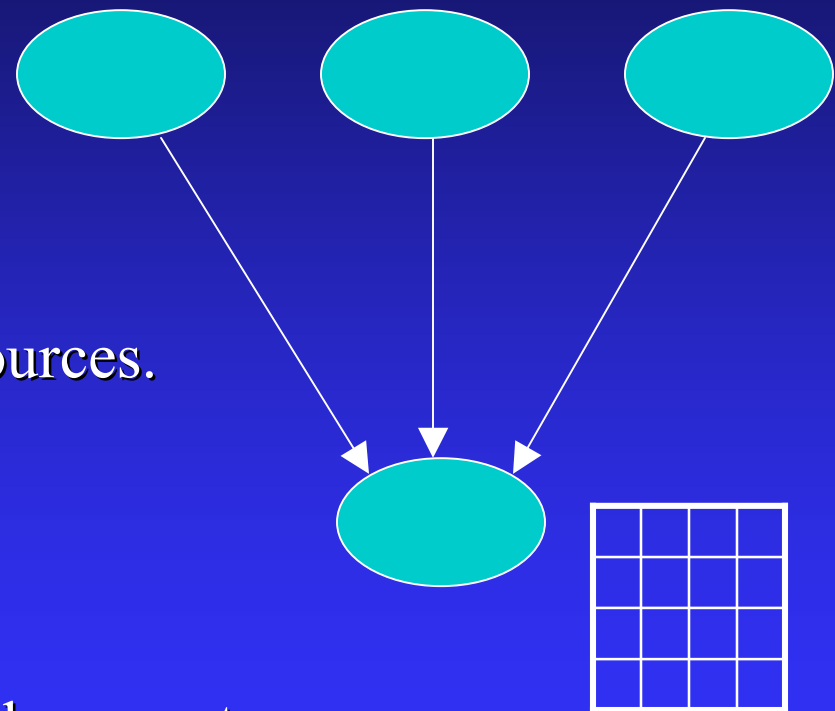
Active Correlation
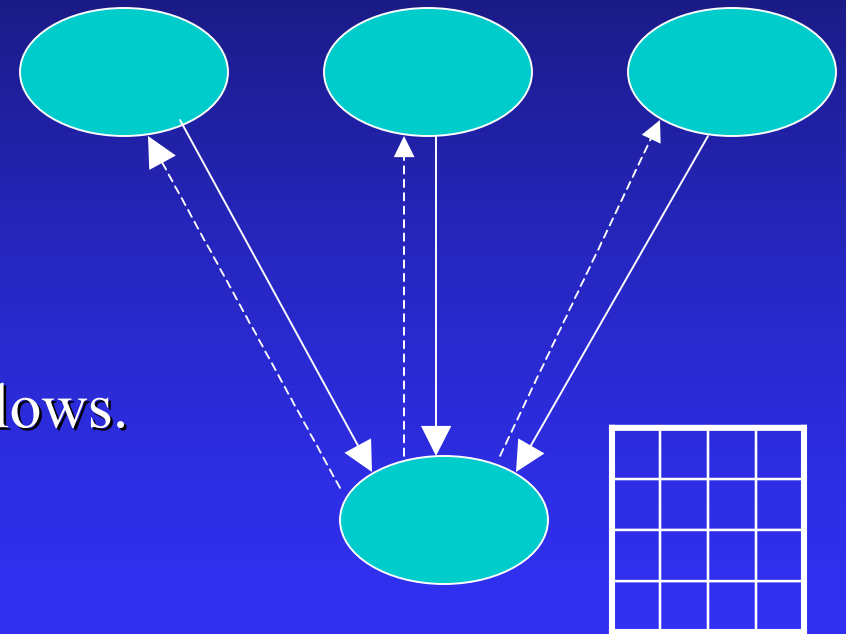
Dynamically Adds Ids, replicates master profiles, and converts codes into participants

Benefits

- Can share state and support workflows.
- Moderate autonomy

Limitations

- Participants need to have inbound 'new'' and 'set'' methods or wrappers

Data-Level Integration into an Operational Data Store
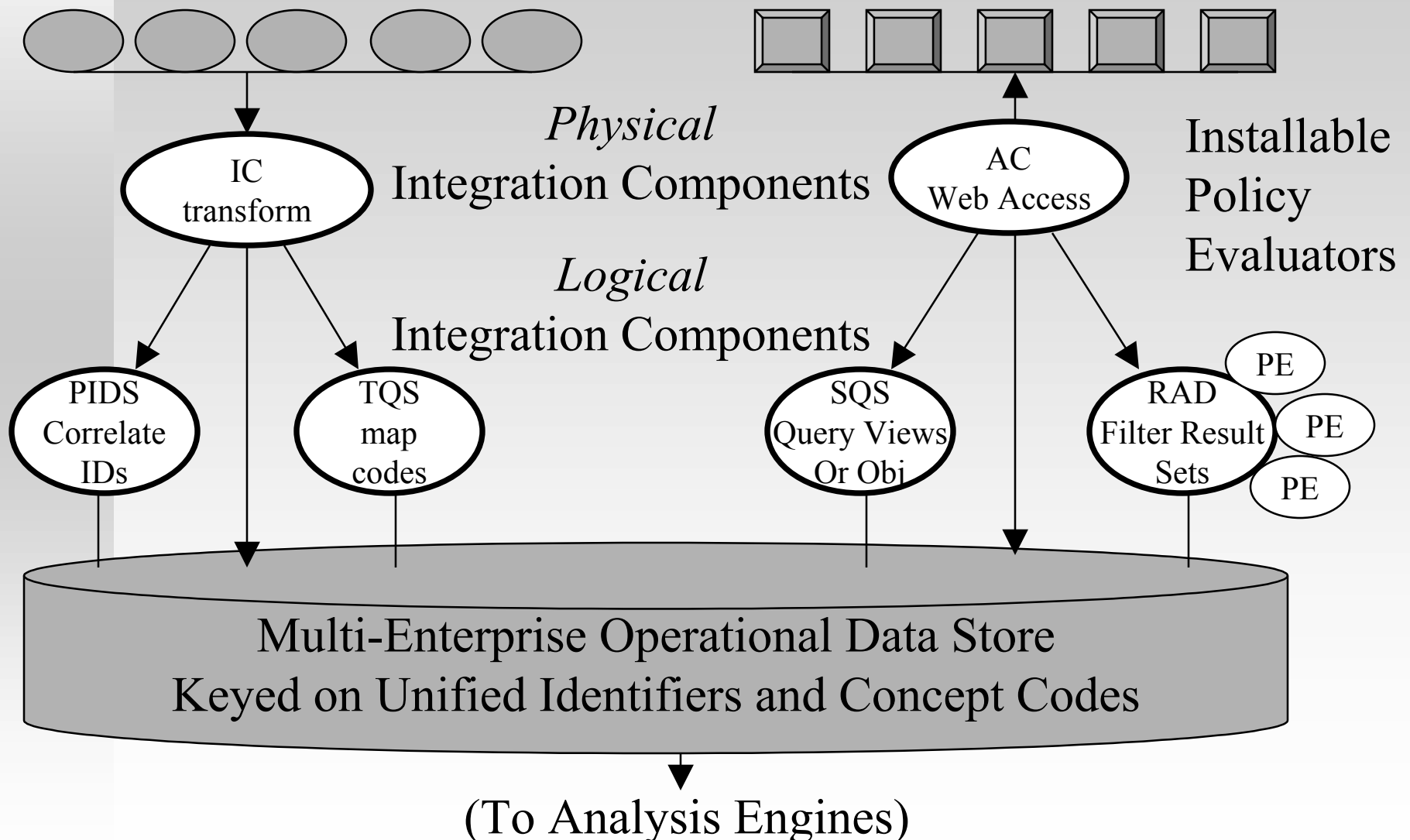
ODS is best architecture for

- Severe Heterogeneity
- High Operational Volumes with Functional Specialization
- Political or Financial Requirement for Autonomy
- Analytical Flexibility

Component-Based Codeless ODS Construction
Best Control Strategy is Backend-Passive Correlation

Anything-Based Participant Systems

AC: Browser & Wireless Users

Physical Integration Components

IC transform

AC Web Access

Installable Policy Evaluators

Logical Integration Components

PIDS Correlate IDs

TQS map codes

SQS Query Views Or Obj

RAD Filter Result Sets

PE

PE

PE

Multi-Enterprise Operational Data Store
Keyed on Unified Identifiers and Concept Codes

(To Analysis Engines)

St. Joseph's Regional Health Systems, Stockton, CA

Overview

- ◆ ODS Architecture with Background passive ID correlation
- ◆ 40+ feeds from healthcare providers
- ◆ Access by 80+ physician practices
- ◆ Now converting to Web Applets for Docs and Servlets for patients

Logical Components by

- ◆ OMG PIDS-compliant real-time ID correlation by CDS
- ◆ Simple Code mappings declared in the integration engine
- ◆ Consistent clinical observation and diagnoses codes *by edict*

Zero lines of Code

University of Michigan Hospitals CareWeb Repository

Overview

- ODS Architecture with Background passive ID correlation
- 70+ feeds from numerous healthcare providers
- Currently enhancing CDR and apps to create order communications across multiple placer and filler applications
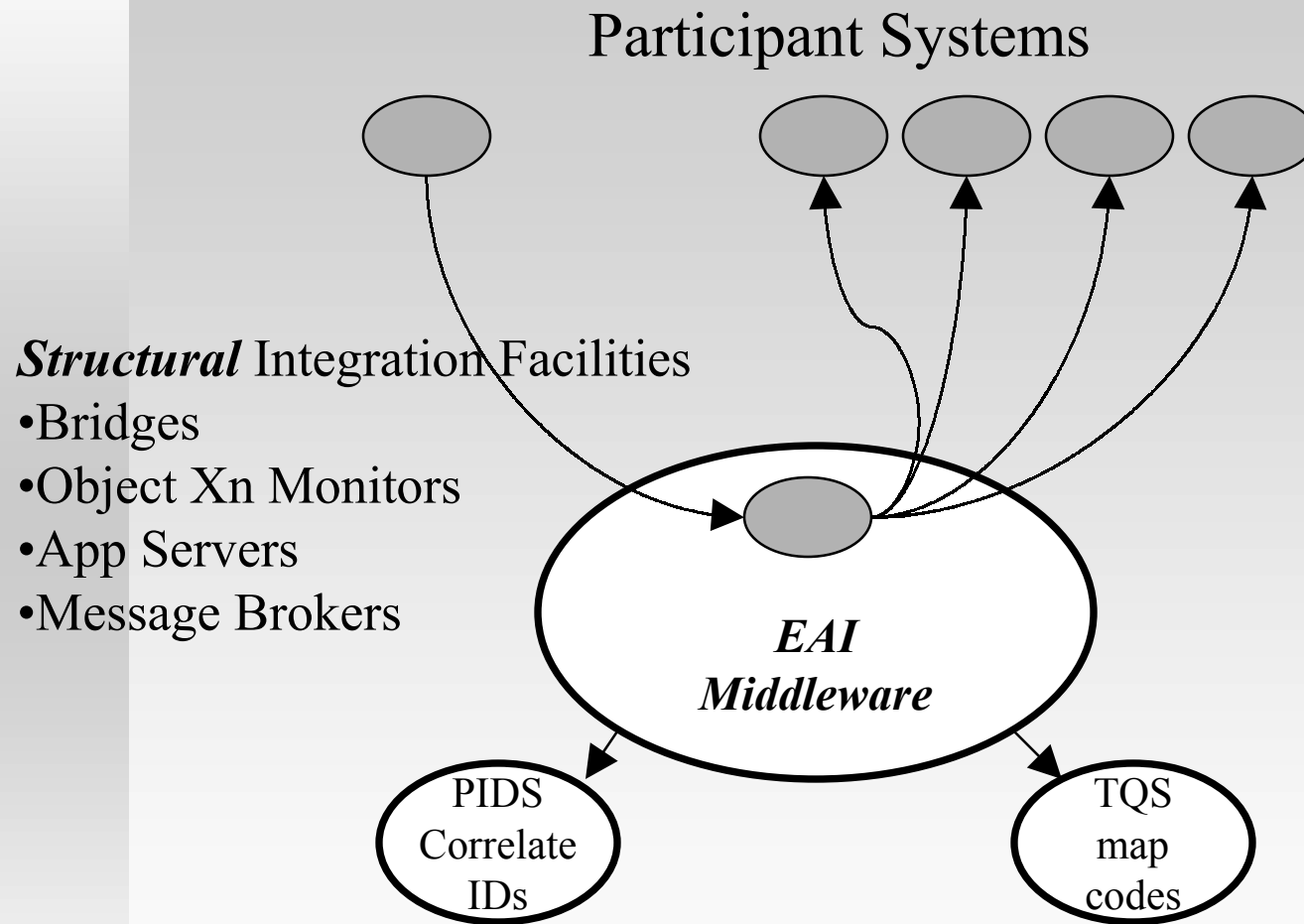- Separate Analytical Data Warehouse

Logical Components by

- Home-grown correlator for patient Ids, called from CDS integration engine
- Cyber LE Lexicon for code translations
- Contemplating PIDS-based Provider index

Applying Logical Components in *Process*-Level Integration

■ Background (passive) correlation won't suffice because the cooperation is *active*.

◆ *Apps must recognize each other's work pieces and state changes*

◆ *Distributed transaction atomicity matters*

■ Use Central assigner where apps will tolerate it – Natively PIDS-and TQS-based

■ Use Active Correlation with n-way real-time translations across participants

Operational Process-Level Integration:
Central Assigner or Translations

Participant Systems

Structural Integration Facilities
- Bridges
- Object Xn Monitors
- App Servers
- Message Brokers

EAI Middleware

PIDS Correlate IDs

TQS map codes

The EAI middleware
structurally wraps And *Logically Maps Ids and codes* among participants

Conclusions

- Application Integration is not merely interface transformation and distributed transactions

- Don't address identifiers and codes as an afterthought. If they are out of control, then so is privacy.

- When you do build a participant system, use PIDS and TQS internally – so can readily rewire to a central assigner when it's time to integrate

- Middleware vendors – bundle Logical Integration Components to give your clients an architecturally-sound head start.

Questions and Comments?

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