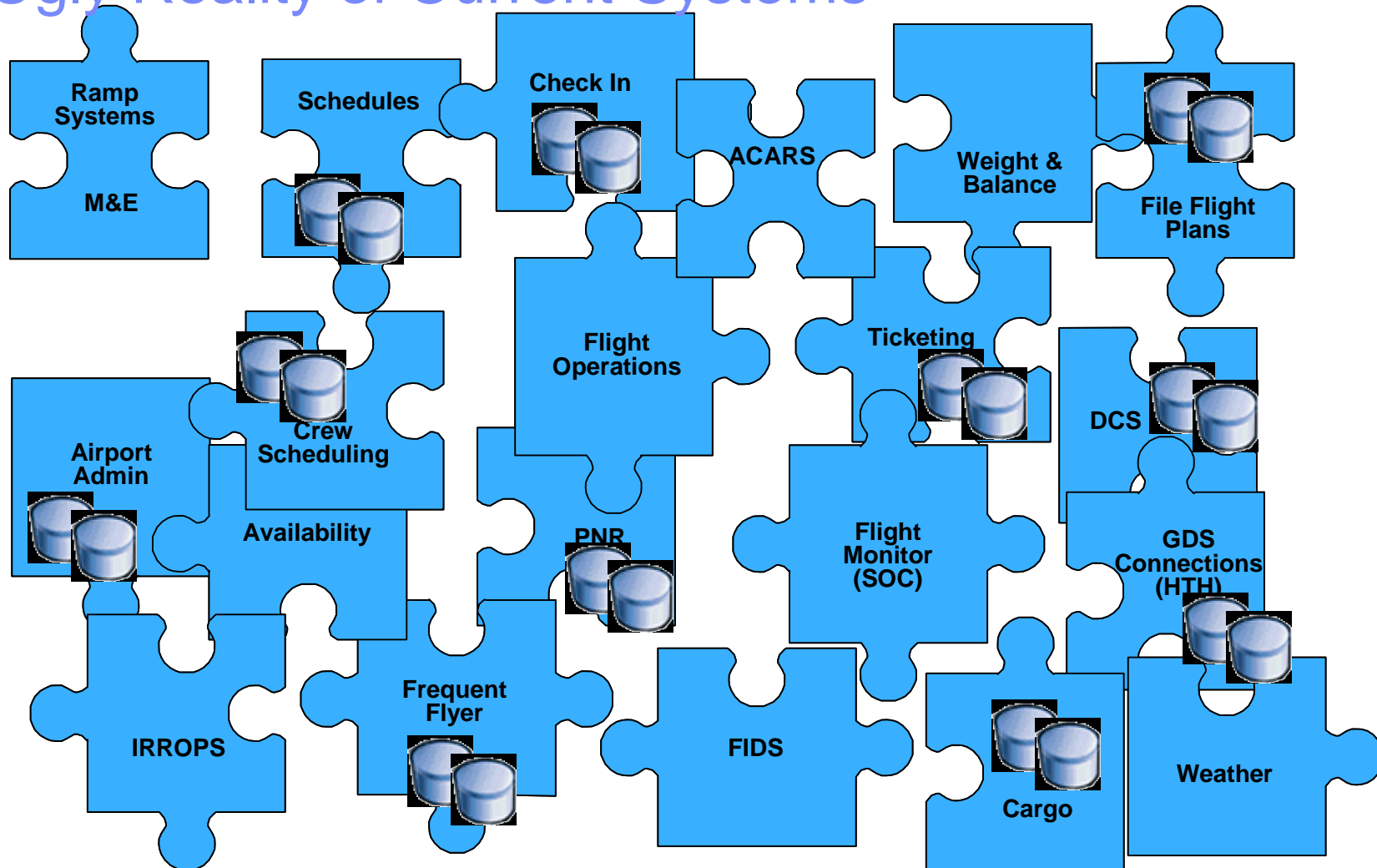# Web Services

TPF Users Group, Acapulco
May 2004

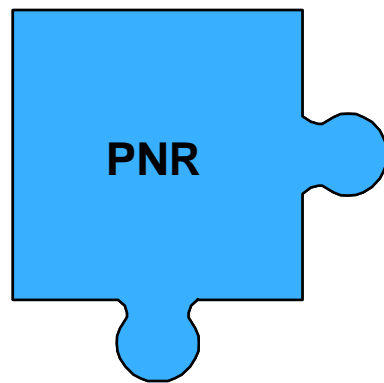Stuart Waldron

IT Challanges

- Complex systems
  - ► Deep technical and industry knowledge required
  - ► Too expensive and time consuming to recreate
  - ► Existing staff and applications must be reused where possible
- Fast moving Industry
  - ► Evolving distribution channels, business relationships, government regulations
  - ► Use open standards where possible
- Growth in the marketplace
  - ► Message rates will increase as the distribution channels become more web based
  - ► Robust, high end systems will be required

The Ugly Reality of Current Systems

Ramp Systems

M&E

Schedules

Check In

ACARS

Weight & Balance

File Flight Plans

Flight Operations

Ticketing

DCS

Airport Admin

Crew Scheduling

Availability

PNR

Flight Monitor (SOC)

GDS Connections (HTH)

IRROPS

Frequent Flyer

FIDS

Cargo
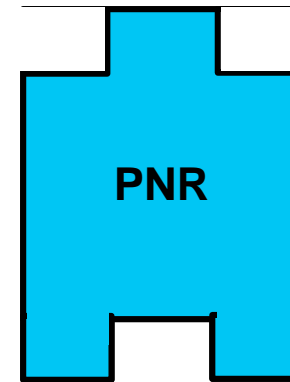
Weather

Systems with duplicate/disparate views of the Customer

Conceptual Solution
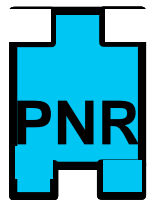

THIS   **Must become**   **THIS**

- To deliver a new generation of applications, you new a new generation of infrastructure
- Proprietary interfaces must become open / standard ones
  - ► Other functions must be able to dynamically find out how to plug into this function, or how it plugs into others
  - ► To promote reuse of functions and reduce duplication of data

Conceptual solution cont…

- Key functions should be viewed as callable services
  - ► Implemented via a Service Orientated Architecture (SOA)
- Service oriented architectures are intended to promote flexibility via clear definition and loose coupling
  - ► All functions (that need to be used by more than one system) are defined as "services"
- Service providers agree a defined, implementation-independent interface with service clients that is "capability" based
  - ► In the old days, we "linked" by address (LNIATA).
  - ► Then we linked by "name" (Host to Host or MQ queue)
  - ► Now we link by "capability"
    - − What is your business function?
    - − How do you deliver it? Network based

PNR

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Key Technology, Web Services

- What does Web Services have to do with the SOA?
  - ► Web Services is a means to implement a SOA
- The Web revolutionized the way people talk to systems:
  - ► Customers: new business models, extension of opportunity
  - ► Employees: new transparency, improved collaboration
  - ► Operators: dramatic reduction in infrastructure costs and complexity
- Web Services delivers the same for a SOA by using a universal program-to-program communication model based on simple open standards and industry support

Key Concept, Yellow Pages

- When you need to repair your automobile do you need to remember:
  - ► Every phone number of every garage in the city?
  - ► Every name of every garage in the city?
  - ► Or just the description "auto repair" and look up the name and number in a directory?
- Web Services provides the same for business functions
  - ► A means to look up the name and number (called bind information) based upon a description of the service
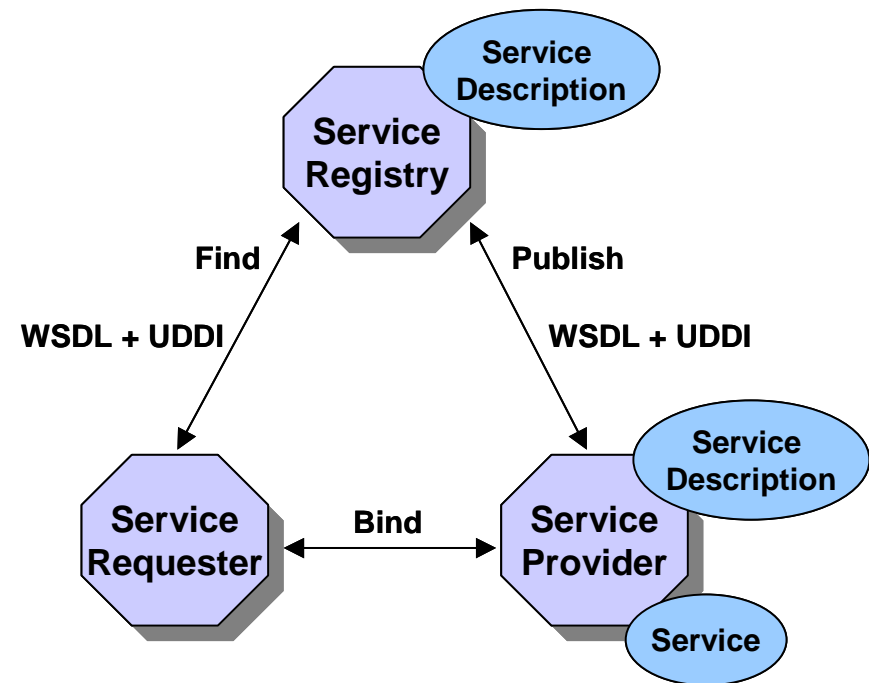
"Auto Repair"

"Brakes"

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Web Services Overview

➢ An interface that describes a collection of operations that are network accessible through standardized XML messaging

➢ Web Services are principally implemented via three core technologies: SOAP, UDDI, and WSDL

- Description Language, WSDL is the "publish" part of the triangle, and it is an XML vocabulary Simple Object Access Protocol (SOAP); the "bind-to and use" part of the triangle

- Universal Description, Discovery and Integration (UDDI) is the "find" part of the triangle
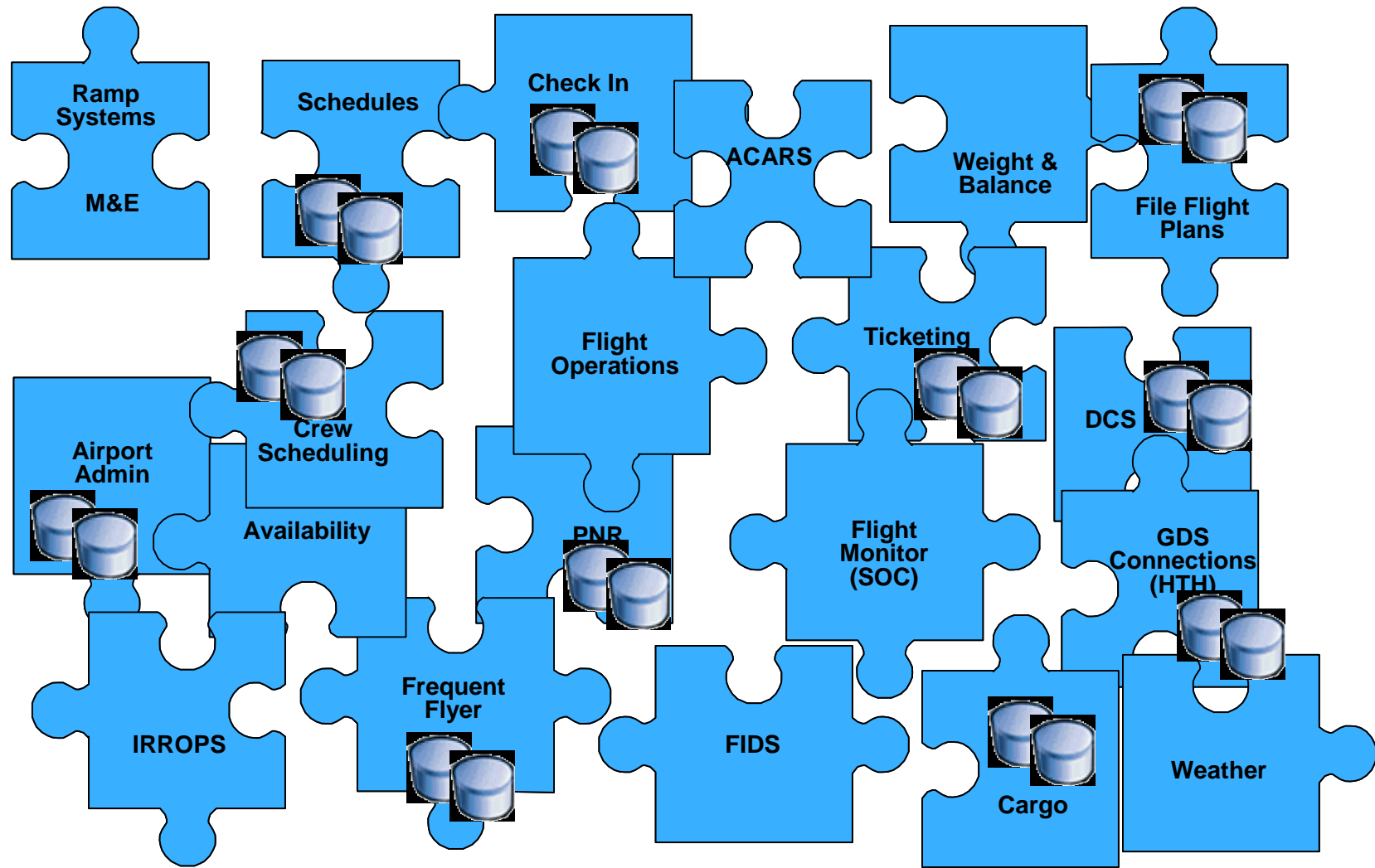
- Web Services describe service interfaces
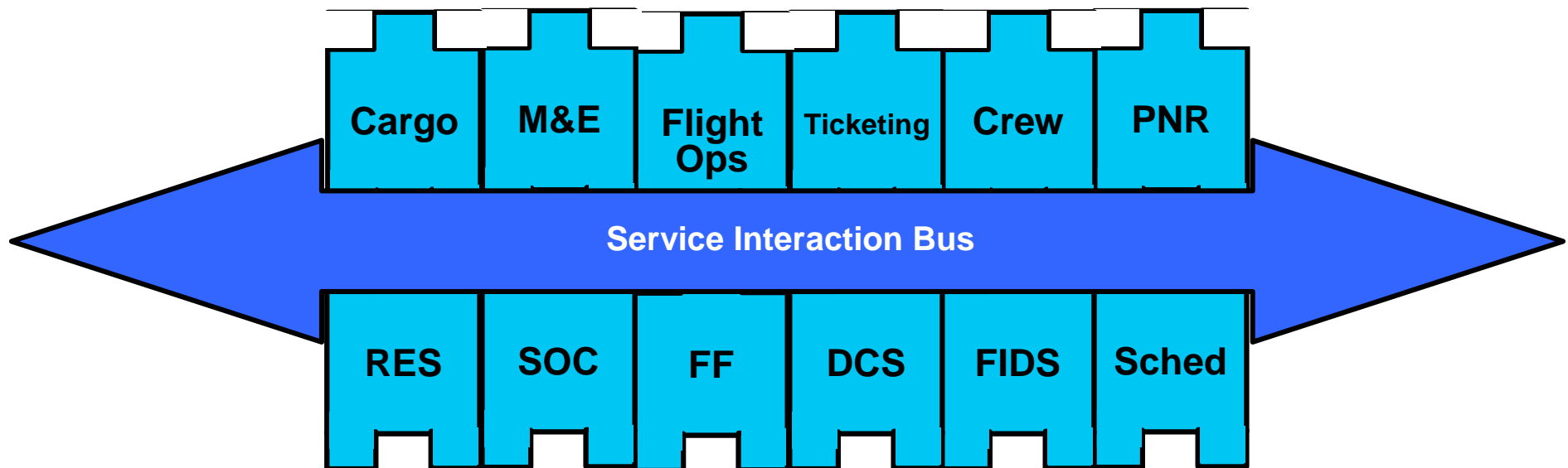
Key Technology, Service Interaction Bus

- What do I need an SI Bus for?
  - ► The SOA is the blueprint
  - ► Web Services provides connectivity
  - ► The SI Bus provides infrastructure
- Many types of Infrastructure
  - ► Support normally provided by the operating system (makes the solution more OS independent)
  - ► Reliable messaging (guaranteed delivery)
  - ► Transaction Support (consistent results)
  - ► Transformation support (allows any server to talk to any other without modifying applications)
  - ► Workflow support (allows automated scripting of business events, error recovery and much more)

So This ,,, needs to become …

The SOA Infrastructure
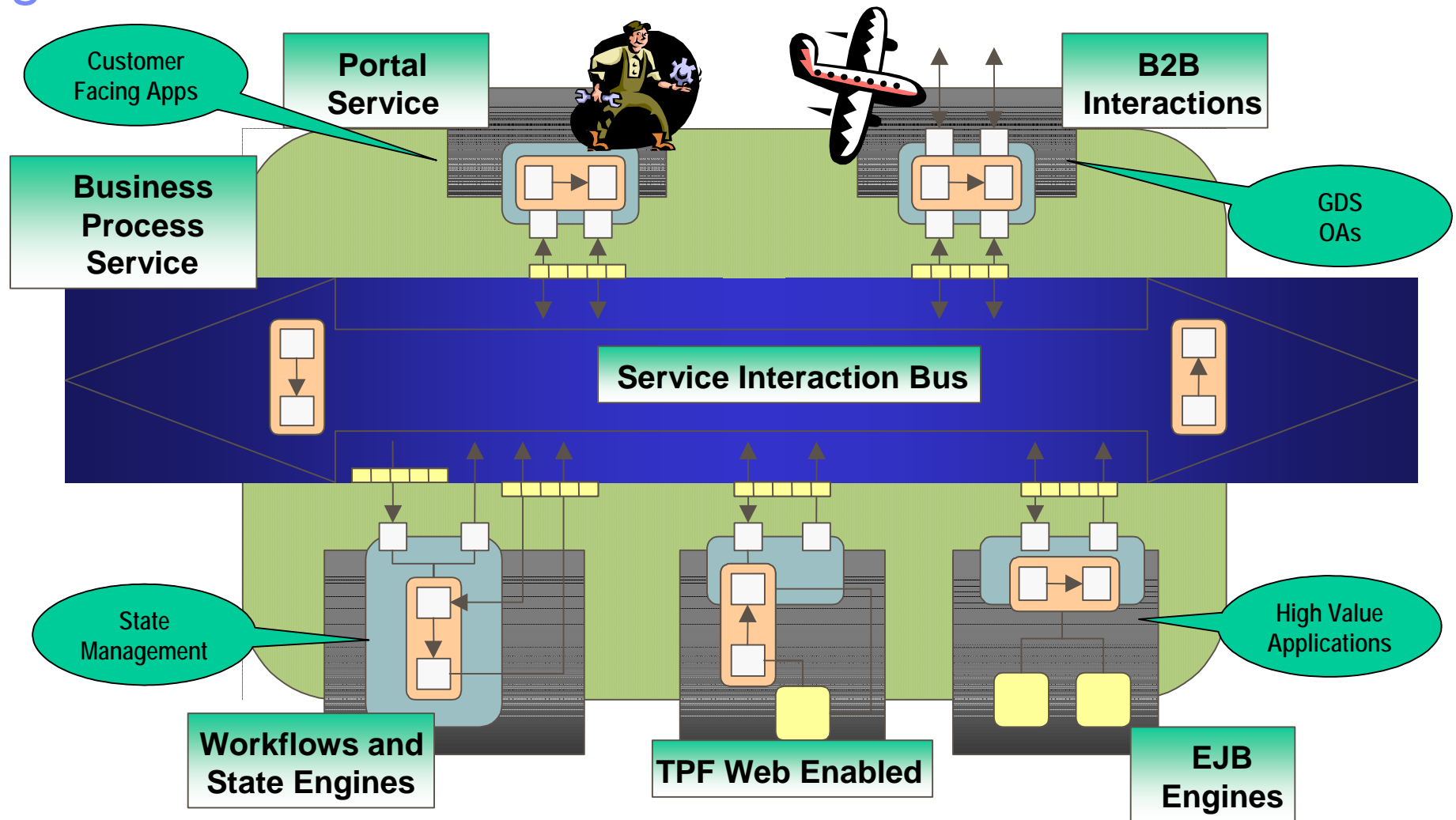
All functions accessible throughout the enterprise

| Cargo | M&E | Flight Ops | Ticketing | Crew | PNR |

Service Interaction Bus

| RES | SOC | FF | DCS | FIDS | Sched |

Assets can now be fully exploited to meet business goals

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So are Web Services the answer? Sort of ...

- Web Services are part of the answer ...
- Service Oriented Architecture (SOA) is another part
- The two are not the same thing:
  - ► Most of today's production Web Services systems aren't service oriented architectures - they're simple remote procedure calls or point-to-point messaging via SOAP
  - ► Most of today's production service oriented architectures don't primarily use Web Services - many use existing mature technologies, such as XML, asynchronous messaging etc.
- To really achieve the promoted benefits of Web Services, you need both
- The TPF community needs to get started with Web Services and Service Oriented Architectures now so you're in a good position to support a competitive business over the next 2-5 years

A Service Oriented Architecture links the major pieces together

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