



IBM Software Group

SAFE – Solution Architecture for Energy & Utilities

2004 March 26th



Mark Weaver

 **business on demand software**

Utilities must improve performance...solutions implemented with IT infrastructure provides competitive advantages



Reducing OPEX cost - optimizing maintenance frequency

“cheaply running the old stuff!”

Reduce CAPEX cost - extending equipment life delaying capital investment

“avoid buying new stuff!”

Increase REVENUE - additional services (QoS, Consolidated Billing, BBoV,,)

“defining the future business!”

Improve CUSTOMER SAT - focusing on service and reliability

***“fewer & shorter outages,
staying out of trouble with regulators”***

Utility Companies produce, transport & distribute resources (e.g. gas, electricity, water,,,) through Utility Networks

▶ The challenge...

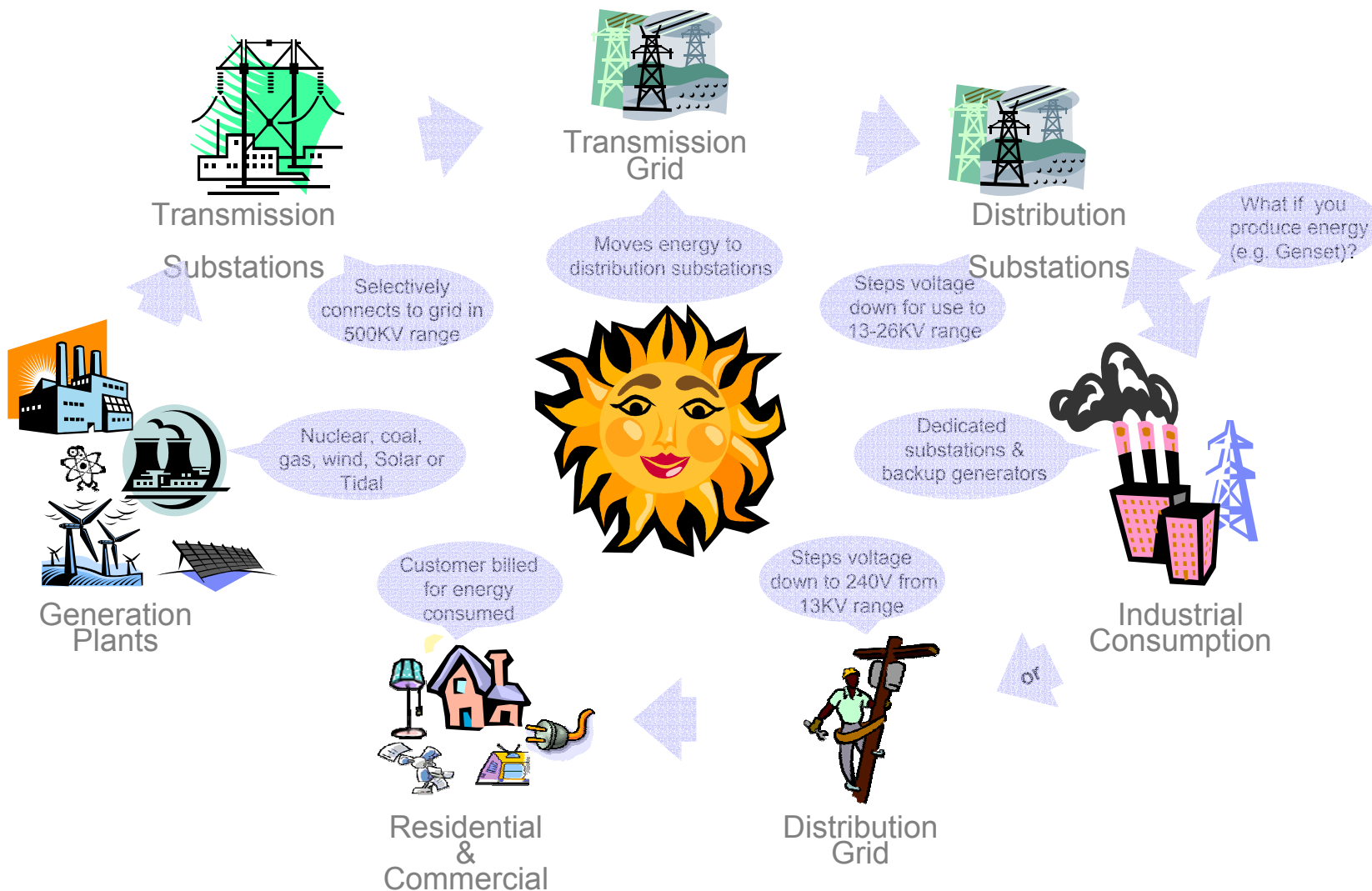
- Large quantities of natural resources (coal, water, gas, etc.)
- Very capital intensive: Generators, Transmission Lines, Transformers, Switches, Meters, etc.
- Labor intensive to keep it running 7 X 24 x 365
- Geographically dispersed assets
- The “ network” is not linear

▶ Water & gas utilities also have networks, but

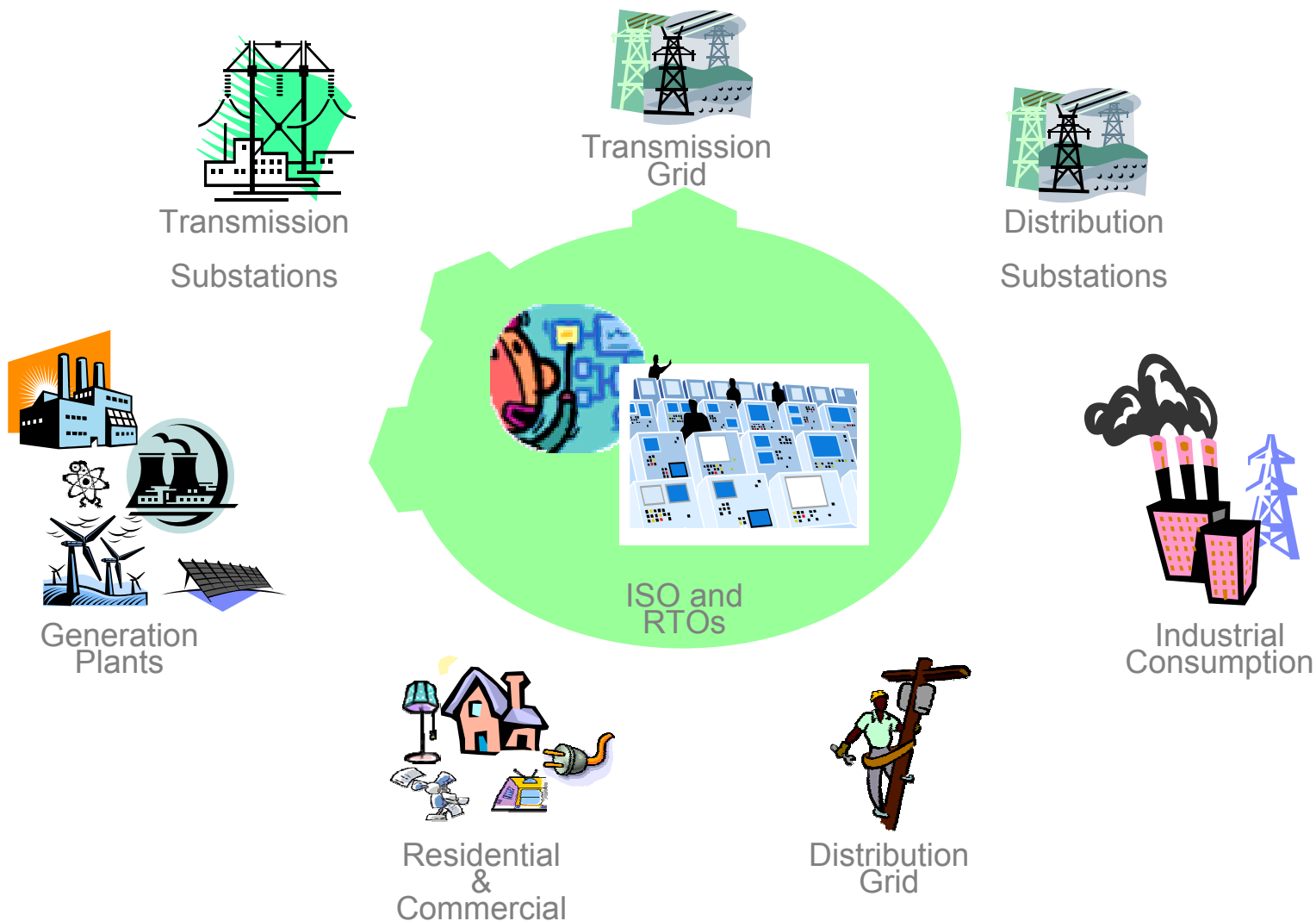
- Production, not generation
- Pipelines, not transmission
- Water & gas are storable resources



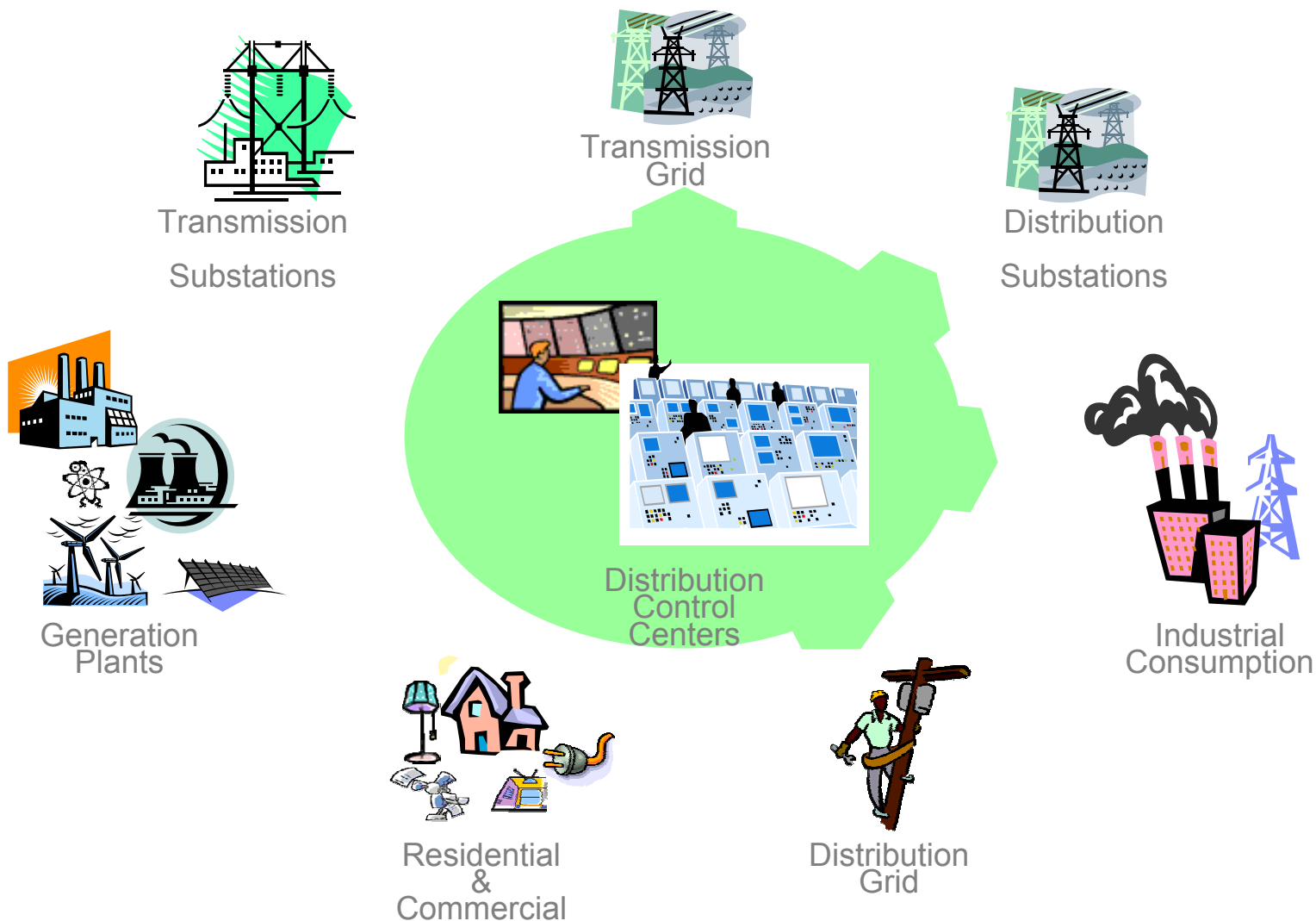
“Utility Network” services offered by network providers...do not confuse with IT network (e.g. IPs, Public Switched Network,,)



ISOs & RTOs buy & sell energy serving as primary control point for moving energy to Distribution Control Centers



Distribution Control Centers monitor customer energy consumption



Call Centers provide customer interface handling service requests, outage complaints, billing inquiries,,,



Transmission Substations



Transmission Grid



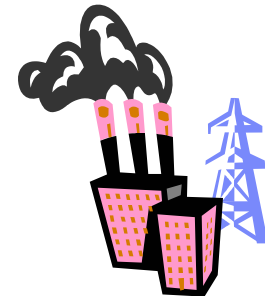
Distribution Substations



Generation Plants



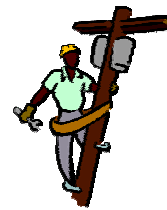
Call Centers



Industrial Consumption

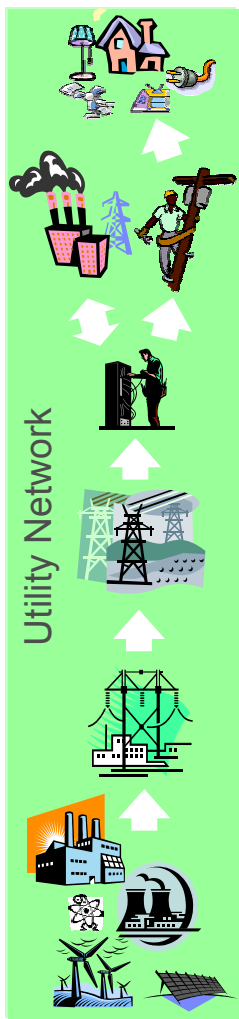


Residential & Commercial



Distribution Grid

Optimizing existing investments, responding to customer demands, new opportunities, and regulations

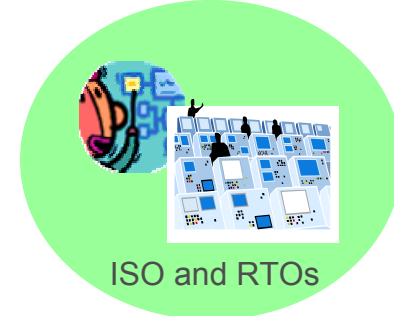
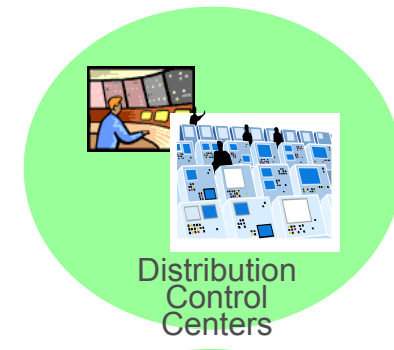


▶ Significant IT investment to build, monitor, maintain network, usage billing, and manage required human resources

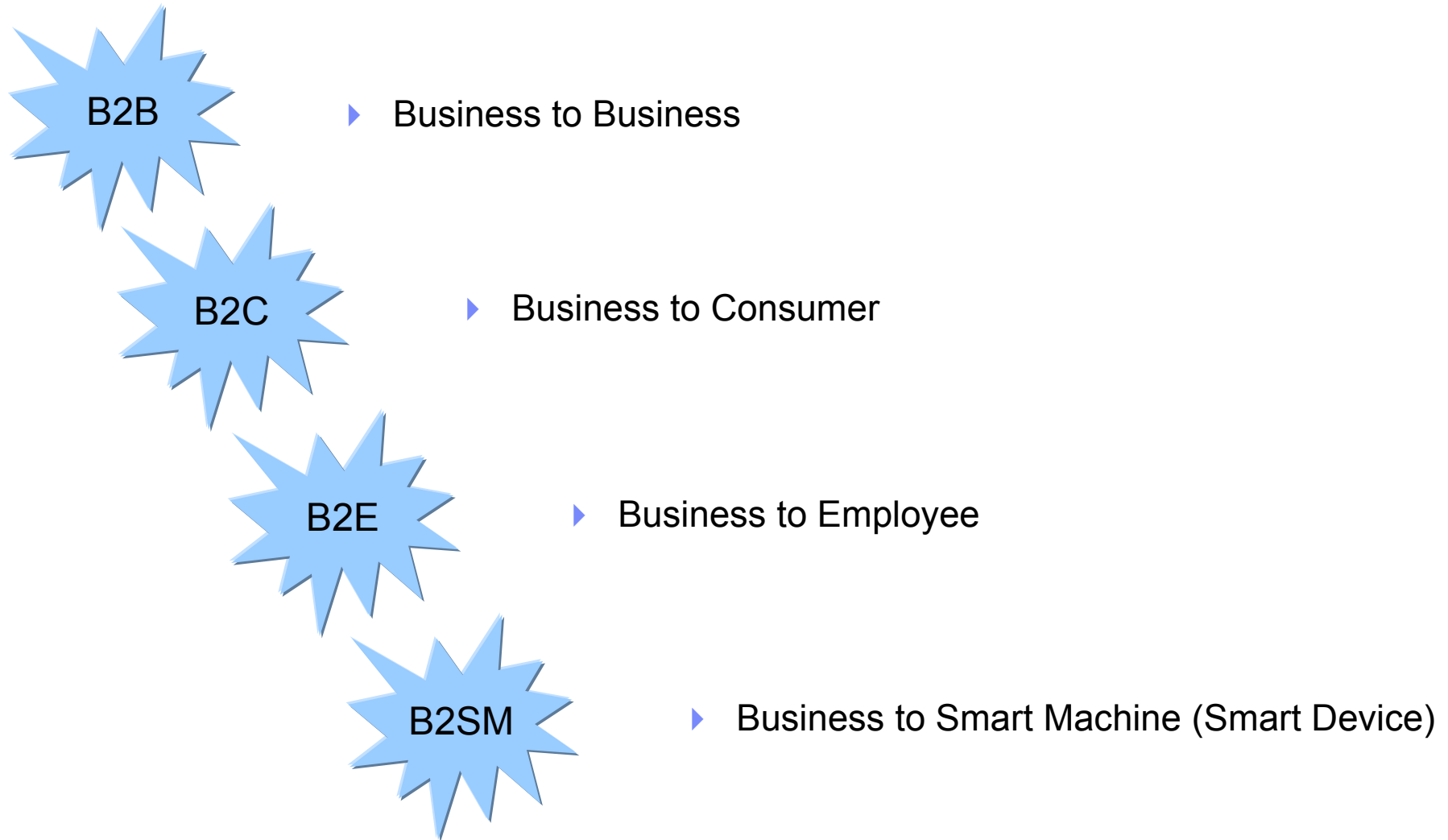
▶ Deregulation, acquisitions, new technologies (e.g. wireless, smart devices) create service opportunities

Enterprise Application Domain

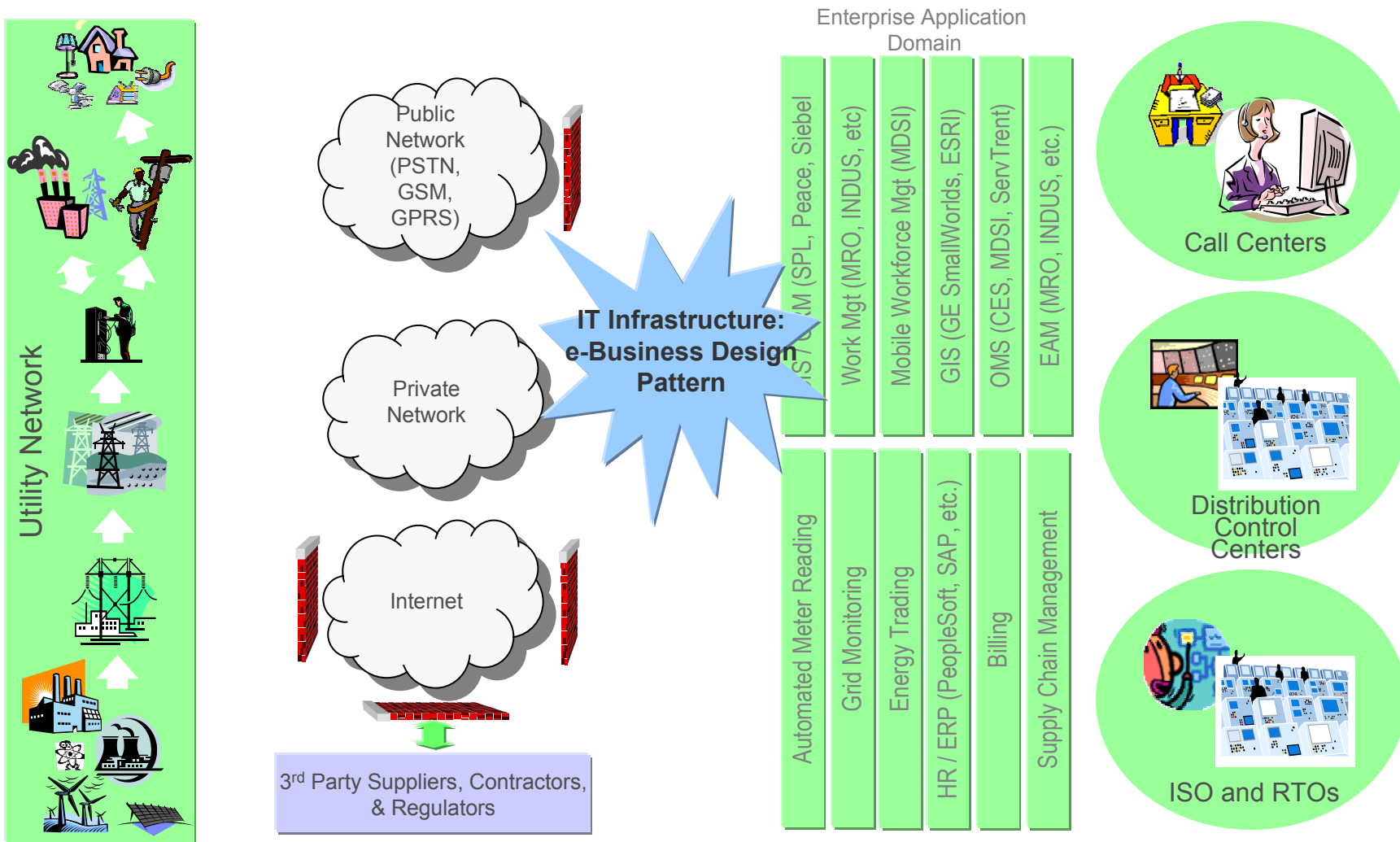
Automated Meter Reading	CIS / CRM (SPL, Peace, Siebel)
Grid Monitoring	Work Mgt (MRO, INDUS, etc)
Energy Trading	Mobile Workforce Mgt (MDSI)
HR / ERP (PeopleSoft, SAP, etc.)	GIS (GE SmallWorlds, ESRI)
Billing	OMS (CES, MDSI, ServTrent)
Supply Chain Management	EAM (MRO, INDUS, etc.)



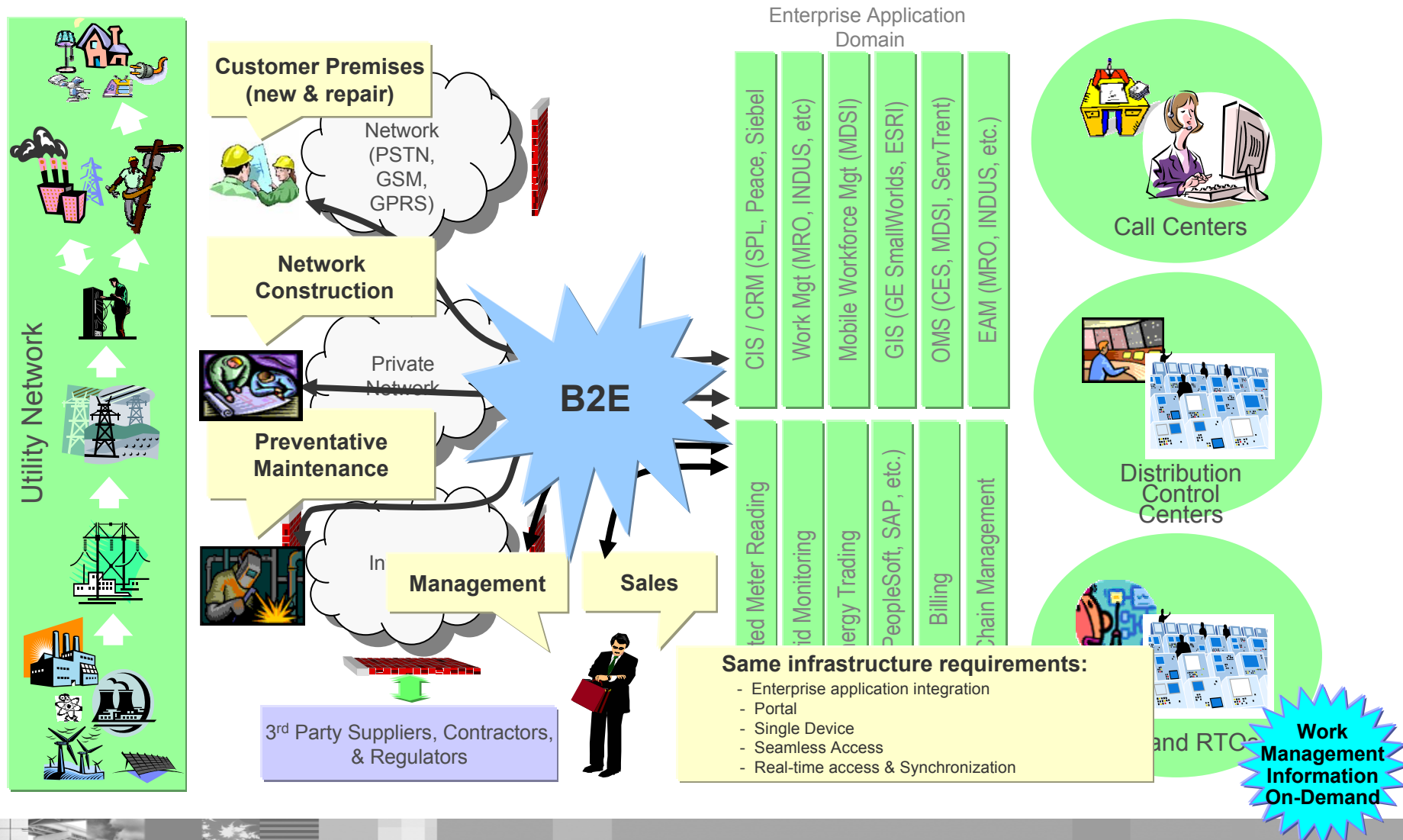
e-Business design patterns identify IT infrastructure requirements



IT Infrastructure / e-Business Design Pattern template

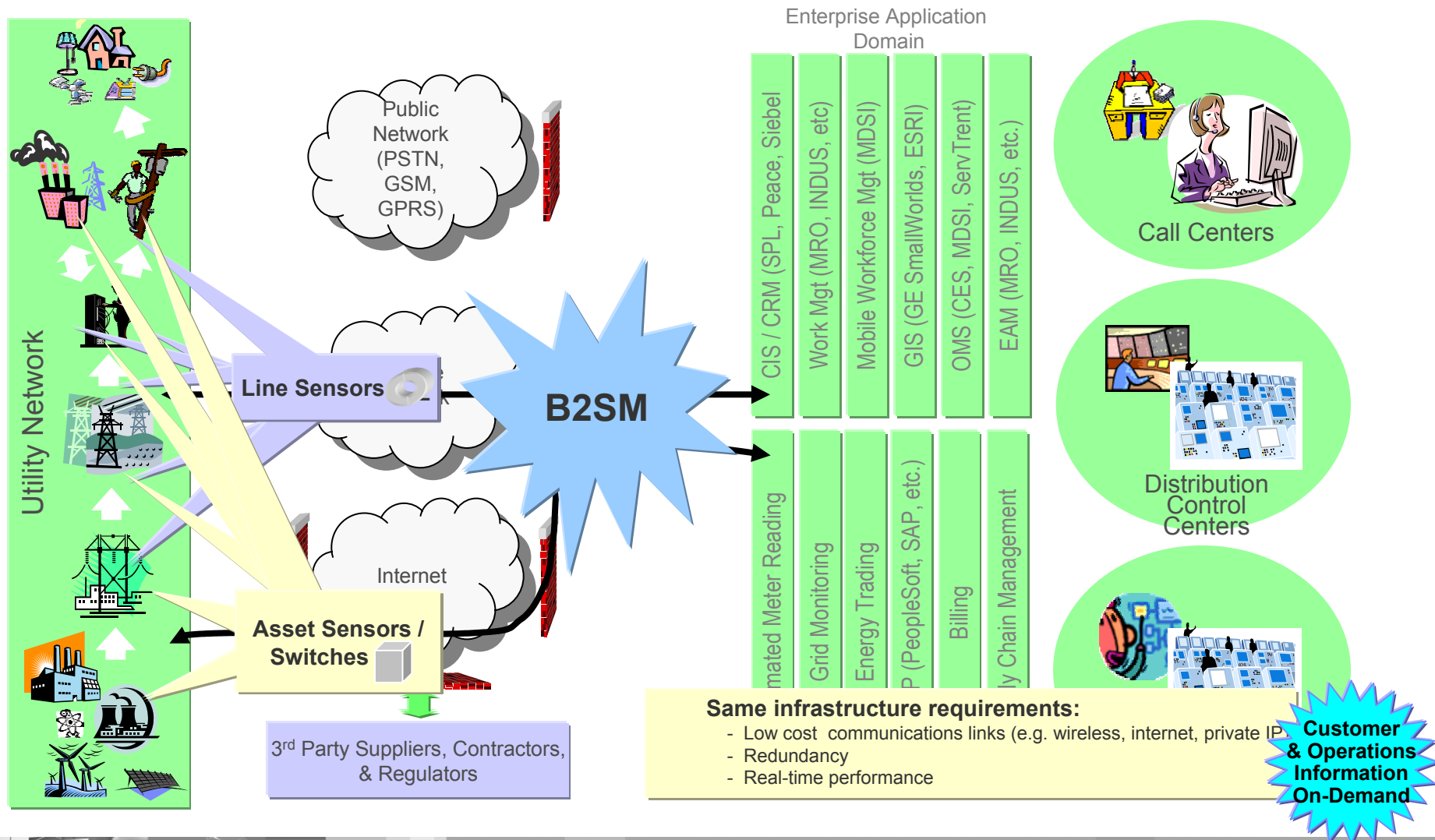


Workforce optimization requires access to applications anytime / anywhere *(e.g. Work orders, asset info, real-time status, optry sales/entitlements)*

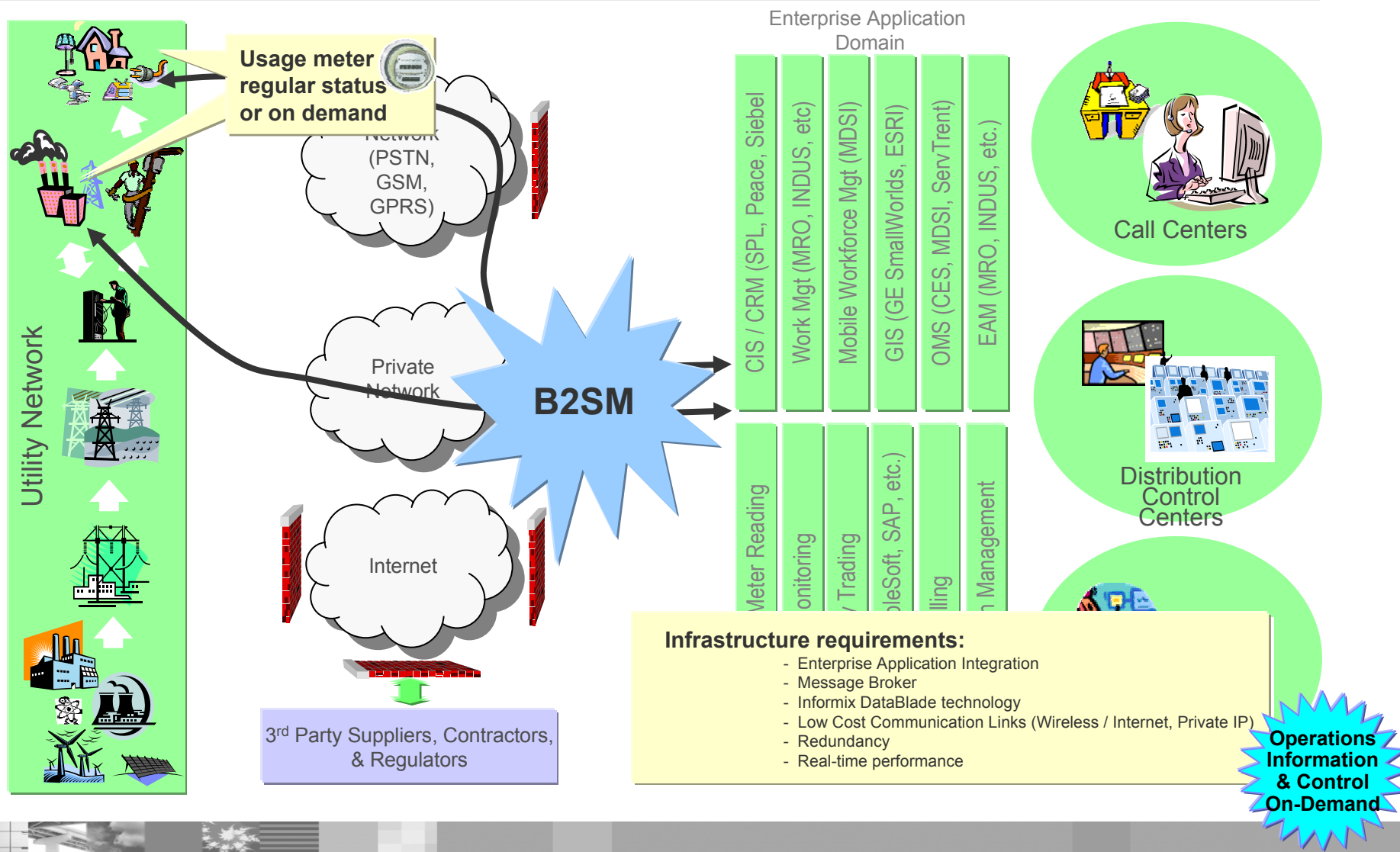


Network operations / management controls real-time devices

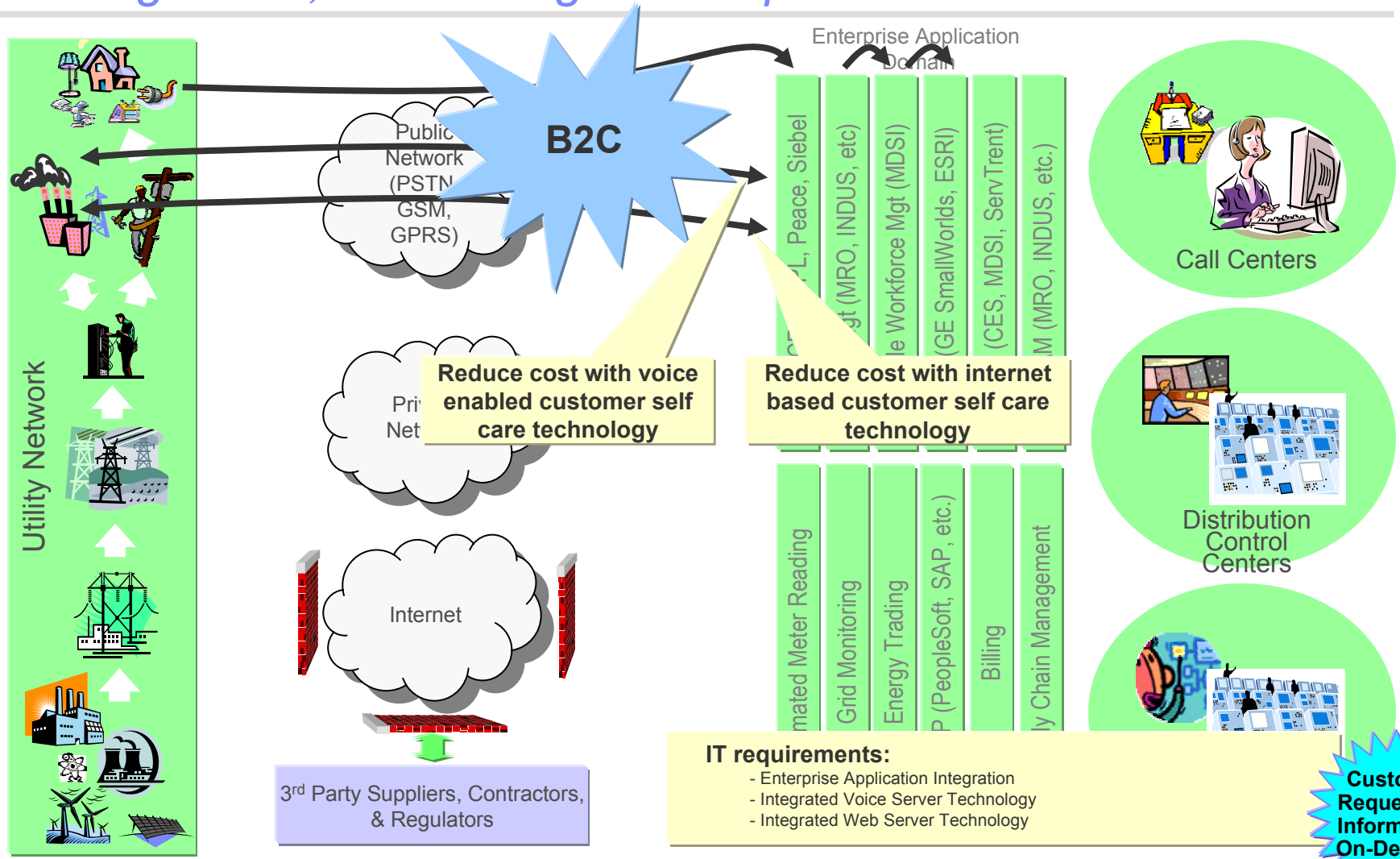
(e.g. Usage meters, line voltage, transformer efficiency / heat, and turbine speeds / frequency)



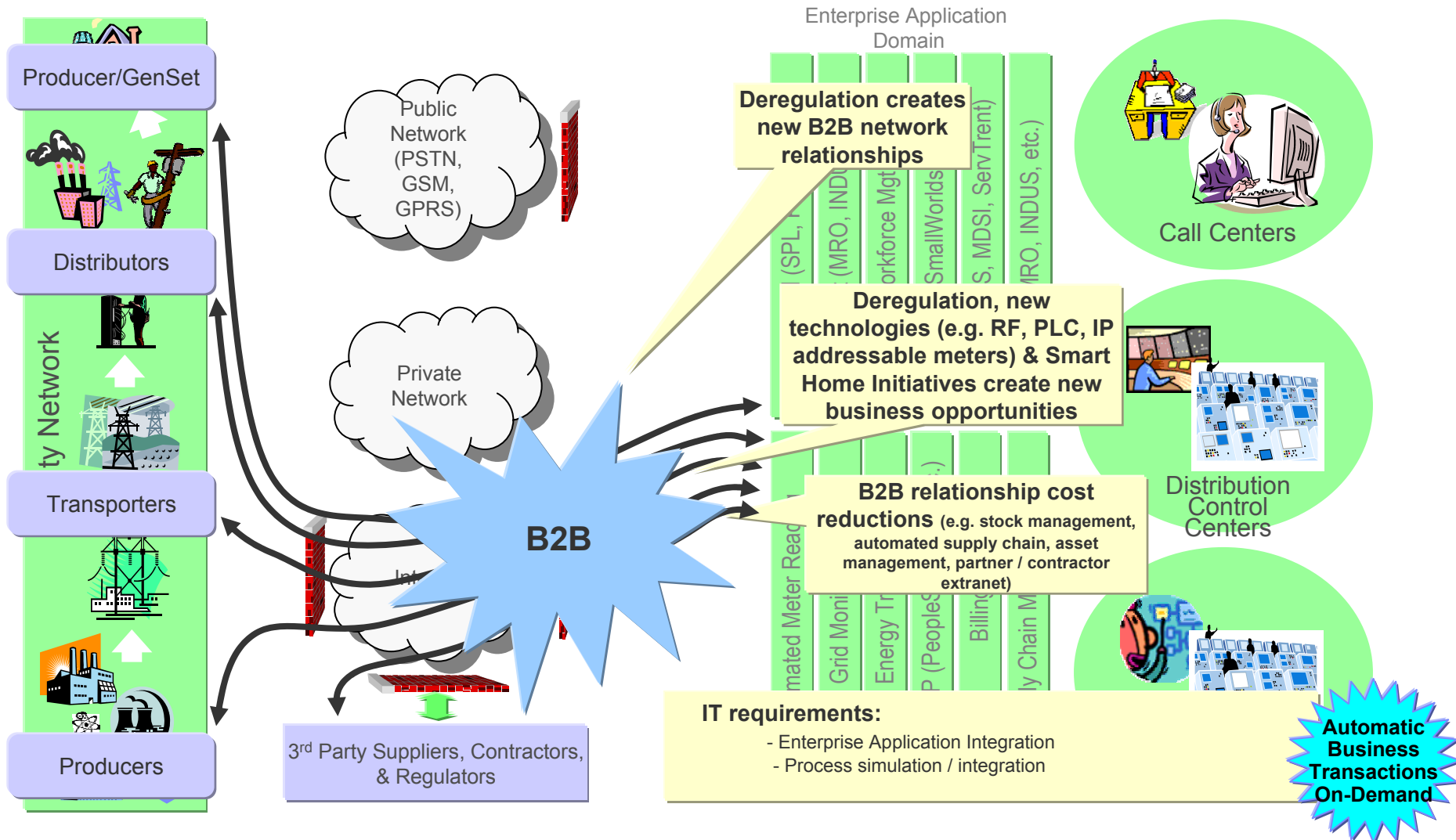
Real-time customer data provides significant competitive advantages *(e.g. Customer inquiry, usage pattern analysis, energy trading, demand scheduling)*



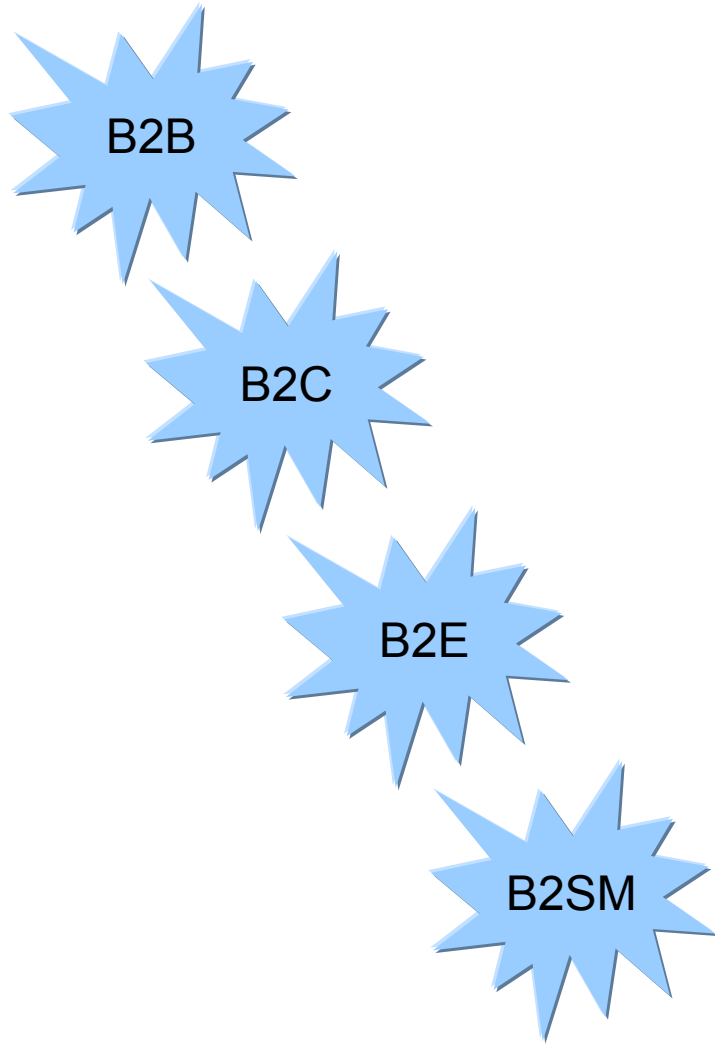
Improve customer support integrating CRM, workforce management, scheduling and dispatch



B2B capabilities enable 3rd Party Suppliers / Contractors / Regulators to make their own Business Transformation



Most customers have similar IT infrastructure element needs



	Enterprise Application Integration	Process Simulation / Integration	User Experience Integration	Message Brokering	Device Access & Connection Mgt	Voice Application Integration	Web Application Server / SOA	Data Integration
B2E	✓	✓	✓		✓	✓	✓	
B2SM	✓	✓		✓			✓	
B2C	✓	✓	✓		✓	✓	✓	
B2B	✓	✓	✓	✓	✓	✓	✓	✓

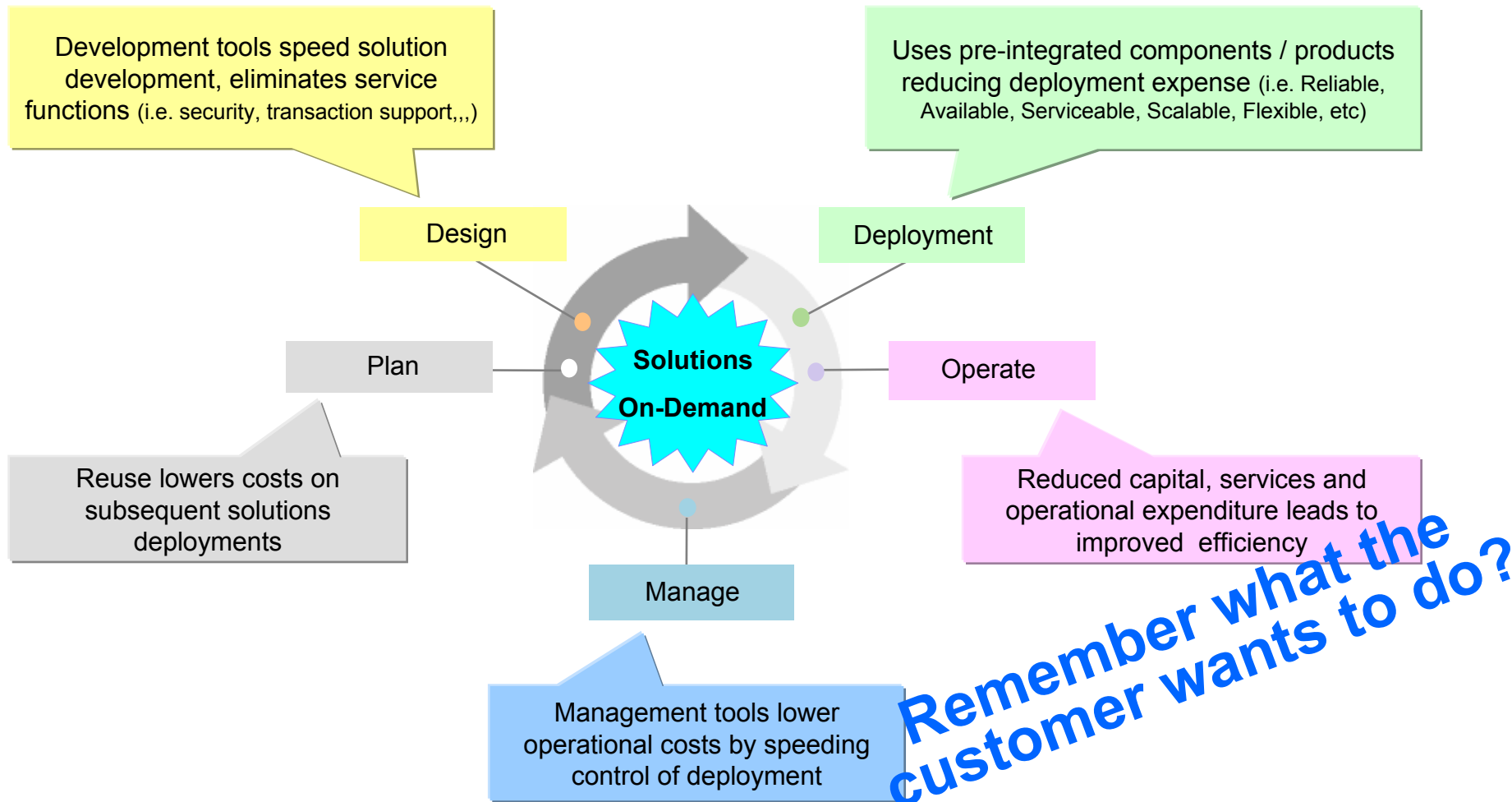
Solution Architecture for Energy & Utilities (SAFE) allows E&Us to become an “on-demand” enterprise

- ▶ SAFE is an architectural blueprint... not a specific product

- ▶ Scalable framework
 - Utilizes open standards - component choice freedom and flexibility
 - Supports latest software technology advances
 - Leverages cross industry and E&U best practices
 - Doing it faster – speeding design, development, deployment and on-going operations of customer’s solution

- ▶ Protects customer investment
 - Embraces customer’s leadership applications with middleware infrastructure
 - Product integration enables interchangeable components and easier migration
 - Supports Service Orientated Architecture (SOA) - integrating web services and external process engines
 - Implementation can be staged as needed

SAFE's value is realized in shorter project lifecycle yielding more projects with higher value



SAFE brings focus across key E&U business endeavors

Contact Center

Providing customer services with less cost and time

Mobile Workforce Management

Using data captured at point of sale to increase field productivity and reduce inventory costs

Asset Operations

Reducing outage recovery time through remote asset monitoring, work management, automated meter reading

Risk Trading & Settlement

Reducing costs by closely monitoring actual energy requirements trading underage/overage to meet demands, minimizing disputes, funds and settlement administration

Regulatory & Government Compliance

Improving financial business controls while increasing security and workforce productivity through SOX and Cyber-security in an on-demand workplace

Utilities Network Revitalization

Customer Operations Transformation

Energy Markets

Corp Support Services Transformation

Customer Defined Projects

...and IBM's "Solution Playbook" solution

...and most any...

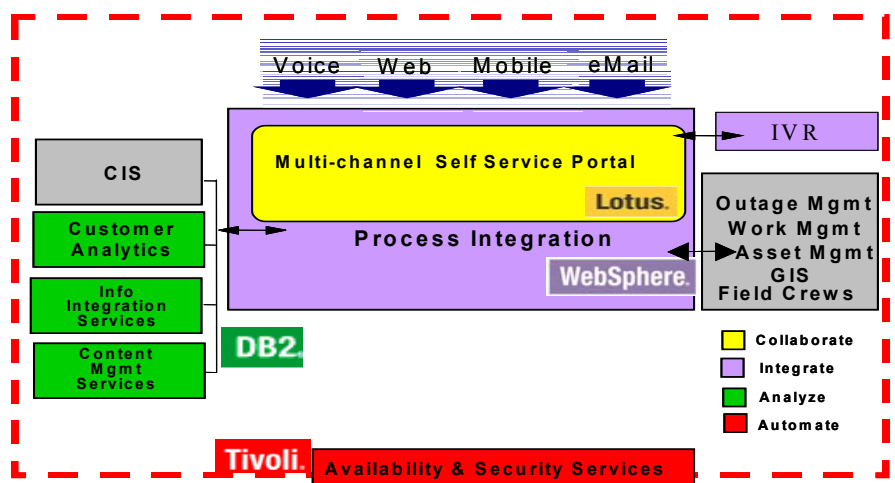


IBM Middleware Solutions for Energy & Utilities – Contact Center Optimizer

Summary - Contact Center Optimization

Overview	
Problem: Customer and employee churn, lack of integrated customer support ops	
Solution: integrated architecture for multi-channel self-service and improved support ops	
Benefits: Lower operational costs, faster response/resolution times	
IBM Differentiators	
Comprehensive end-to-end secure solution from application development (Rational) to providing the knowledge base repository (content mgmt, workflow /data warehouse) to back-end information integration and front-end information delivery via portal and voice	
Representative Projects - How to Get Started	
<ul style="list-style-type: none"> Document/Content Management for KM Portal for Customer Self-Service and IM Customer Ops Mgr Workplace/Portal Improved IVR or Voice Services 	<ul style="list-style-type: none"> Single Customer View across diverse CIS Customer Analytics and profiling CIS Integration to other E&U Systems Commerce Application Web Site

Reference Solution Architecture



Customers

Scottish Power- implemented WebSphere Voice Response in its fault and emergency centers; up to 990 simultaneous customer calls, Reduced churn by 13% per month; Reduced number of operators (approximately \$4M saved per year)

Belgacom: integration backbone supporting over 1 million households

Arizona Public Service (APS): online billing capture and presentment with DB2 Content Manager OnDemand; billing info accessible by customer service reps in 20 seconds compared to 2 days

Capabilities

Core Capabilities	
<ul style="list-style-type: none"> Application & Information Integration Access & Collaborate Business Modeling 	<ul style="list-style-type: none"> Business Process Management Secure

Solution Bill of Materials

Core Products	Industry-Specific Middleware
<ul style="list-style-type: none"> DB2 for Content Management WebSphere Portal Extend, Everyplace Access, Voice Server, Voice Response WebSphere Business Integration Rational ClearCase Change Management Tivoli Identity Manager DB2 UDB, Content Manager on Demand, BI Tools, CommonStore for SAP, Lotus Workplace, WebSphere Commerce, Studio; Rational 	<ul style="list-style-type: none"> WebSphere Modeler Workflow, Monitor SAP and MRO Portlets WBI Adapters: SAP, Peace, SPL, Siebel, MRO, INDUS, MDSI, CES, ESRI, GE Small World

Partners & Proof Points

ISV	<ul style="list-style-type: none"> SPL, eDocs, Siebel, Peace, Viecore
Consulting Partners	<ul style="list-style-type: none"> BCS- Customer Operations & Strategy practice, BTO practice Bearingpoint, Accenture: Customer Operations & Strategy practice, BTO practice

Note: Grey Text = "Extends Solution" but not required; Blue Text means 'Third-party' middleware



IBM Middleware Solutions for Energy & Utilities - Mobile Workforce Management

Summary- Mobile Workforce Automation

Overview

Problem: Improve customer service while reduce cost of service
Solution: Middleware supports field staff accessing corporate systems from any device over any network
Benefits: Lower operational costs, faster response/resolution times

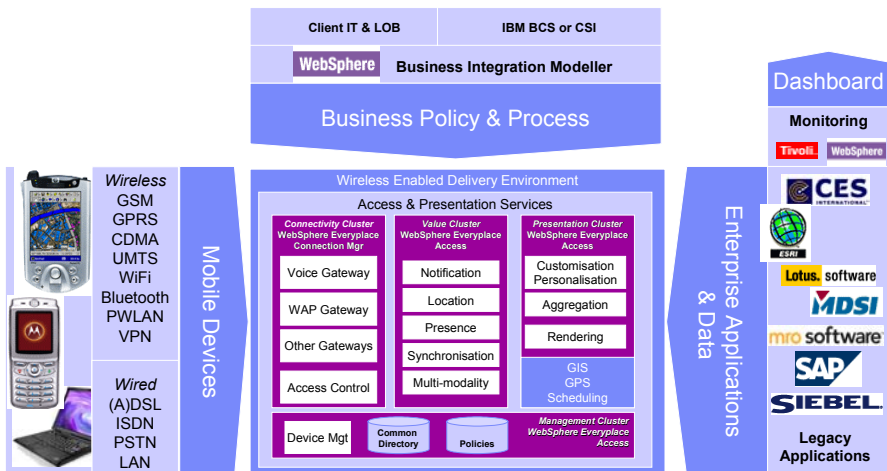
IBM Differentiators

End to end secure solution that enables customers to build flexible systems that are cost effective to support , modify and manage.

Representative Projects - How to Get Started

- Computer Aided Dispatch system
- Credit and Collections
- Inspections
- Outage Management
- Work & Asset Management
- Gas Leak Management
- Field Service: Turn on, Turn off, Meter Read

Reference Solution Architecture



Customers

KeySpan – implemented WBI and Websphere Everyplace Access. Project Payback was less than a year. Paperless environment reduced data latency and improved data accuracy. Overtime and subcontract work reduced.
Gaz de France – reduced paperwork, improved data accuracy and quality by connecting Palm O/S devices using IBM middleware to SAP plant management system
NGT - reference and “Mobilizing Your Workforce” brochure available @ www.ibm.com/industry/utilities

Capabilities

Core Capabilities

- Application & Information Integration
- Access & Collaborate
- Infrastructure Management (Secure)
- Business Modeling
- Business Process Management

Solution Bill of Materials

Core Products

- DB2 Everyplace
- DB2 Content Manager
- WebSphere Portal Extend, Voice Server, Voice Application Access, WECM, WEA
- WebSphere Everyplace Access, Everyplace Connection Mgr, WBI, MQ, MQE
- WebSphere MQ Telemetry Transport
- Rational Clear Case Management
- Tivoli Identity, Device Manager
- Tivoli Config Management

Industry-Specific Middleware

- WebSphere
 - Modeler
 - Workflow
 - Monitor
- Portlets
 - SAP, MRO
- WBI Adapters: SAP, Peace, SPL, Siebel, MRO, INDUS, MDSI, CES, ESRI, GE Small World

Note: Grey Text = “Extends Solution” but not required; Blue Text means “Third-party” middleware

Partners & Proof Points

ISVs	<ul style="list-style-type: none"> Partners: GE Power Systems, SAP, Itron, Siemens, Indus, Siebel, MDSI, MRO Software, ESRI, TeleSpark, MapFrame, Work Suite
SI Partners	<ul style="list-style-type: none"> BCS Customer Operations & Strategy Practice; Pervasive Practice Kema – Field Force Automation Practice Accenture – Work and Asset Mgmt Practice



IBM Middleware Solutions for Energy & Utilities –Asset Operations

Summary- Asset Operations Solution

Overview	
Problem: Reduce outage management time	
Solution: Integrated architecture to enable real-time data accessibility, collaborative workflow and communication and remote asset monitoring access	
Benefits: Lower costs, improved asset utilization	
IBM Differentiators	
<ul style="list-style-type: none"> Comprehensive architecture to span all aspects of the people, process and information integration Key partnerships (Arcom Controls) and adapters to leading outage mgmt (CES) and asset mgmt systems (Indus, MRO, Peace, SAP) 	
Representative Projects - How to Get Started	
<ul style="list-style-type: none"> Mobile Employee Connectivity / Pervasive technologies Business Integration between Asset Mgmt/MRO system and ERP 	<ul style="list-style-type: none"> Workflow for Maintenance Procedures Outage Management Portal (eLuminations dashboard) Outage application integration (CES)

Customers

Chevron Texaco— using WBI and Arcom Controls Communication Gateway for automated flow measurement systems with secure authenticated network connectivity over entire SCADA network.

- Improved billing cycles; significantly reduced billing errors and need for reconciliation

TransAlta - using WBI and Arcom to provide SCADA data security; SCADA data easily published to enterprise applications; 25% (\$2M/year) communication cost savings

Capabilities

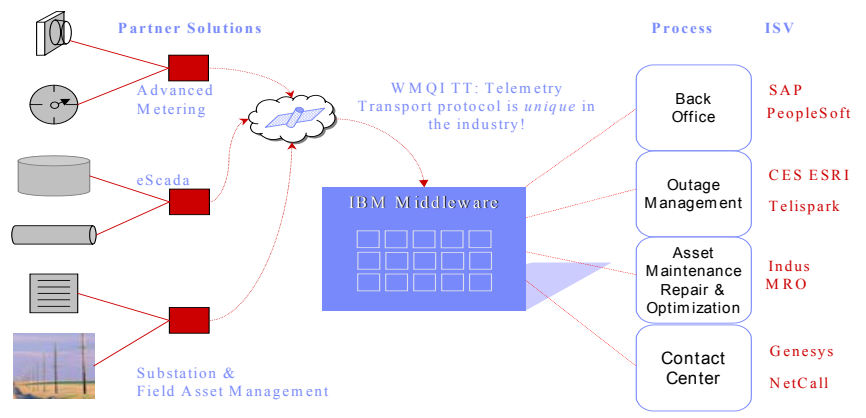
Core Capabilities	
<ul style="list-style-type: none"> Access & Collaborate Business Process Management Business Modeling 	<ul style="list-style-type: none"> Application & Information Integration Secure

Solution Bill of Materials

Core Products	Industry-Specific Middleware
<ul style="list-style-type: none"> Informix IDS DB2 Information Integrator WebSphere MQI WebSphere Portal Extend Rational Rapid Developer 	<ul style="list-style-type: none"> WBI Adapters: CES, CCS, Indus, Itron, MRO, Peace, SAP WebSphere Modeler Workflow WebSphere Monitor SAP Portlets Communication Gateway Arcom Controls Communication Gateway Itron Communication Gateway GE

Note: Grey Text = "Extends Solution" but not required; Blue Text means "Third-party" middleware

Reference Solution Architecture



Partners & Proof Points

ISVs	<ul style="list-style-type: none"> Our ISV Partners for this solution contribute functionality in asset and operational management Partners: GE Power, Arcom, Siemens, Peace Software, Itron, Indus, SAP, TeliSpark, MDSI
Consulting Partners	<ul style="list-style-type: none"> BCS Asset Mgmt Consulting Practice Accenture Work & Asset Mgmt Consulting Practice Kema: SCADA Operations Consulting Practice



IBM Middleware Solutions for Energy & Utilities –Trading & Settlement

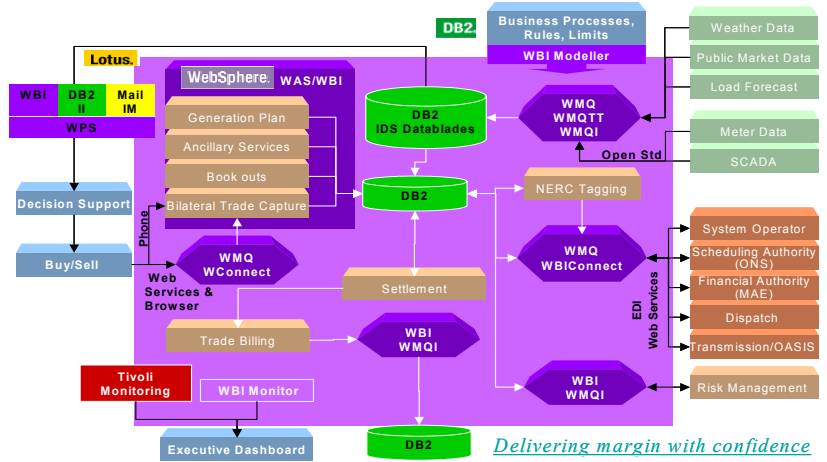
Summary- Energy Trading Solution	
Overview	
Problem:	Individual trading silos with lack of responsiveness, efficiency, control and flexibility, and high transactional costs
Solution:	A scalable, secure and reliable architecture that integrates the entire trading floor across commodities, from front to back office, delivering data on-demand to enhance decisions and automates transactions with counterparties and asset owners.
Benefits:	Lower operational costs, improved trading margins, reduced risk, greater control
IBM Differentiators	
<ul style="list-style-type: none"> Comprehensive architecture to span both individual trading lines and cross-trading line Unique assets & patents around leading trading systems MQ is already the backbone to many trading floors 	
Representative Projects - How to Get Started	
<ul style="list-style-type: none"> Asset/Market/News/Weather Real time Data On Demand Infrastructure Front Office Portal Trading System Modernization 	<ul style="list-style-type: none"> Trading Security & Availability Real time Analytics Trade Master Data Management Regulatory (Sarbanes-Oxley, FASB, SEC, FSA etc) Compliance

Customers
<p>TransAlta – integrated trading hub for improved trading performance and consolidated risk management, leading to faster responsiveness to change, faster reconciliation of credit risks, leveraging trading data in other risk mgmt and business optimization projects.</p> <p>Morgan Stanley – integrated trading hub yielding competitive advantage (#1 equity trade execution in U.S. and Europe)</p>

Capabilities	
Core Capabilities	
<ul style="list-style-type: none"> Access & Collaborate Business Modeling Business Process Management 	<ul style="list-style-type: none"> Application & Information Integration Secure Business & IT Monitoring

Solution Bill of Materials	
Core Products	Industry-Specific Middleware
<ul style="list-style-type: none"> Informix IDS DB2 Information Integrator WebSphere Portal Rational Rapid Developer WebSphere Commerce WBI DB2 Content Manager, Record Manager, DB2 for CRM Tivoli Monitoring 	<ul style="list-style-type: none"> Informix IDS 9.30 database (TimeSeries 4.01 database, Real-Time Loader 1.0, Excalibur Text Search DataBlade) IBM Office Connect WBI Adapter for SAP WebSphere Modeler Workflow & Monitor SAP Portlets Apama Platform & Cap. Markets Templates NAG 1.10 Datablade Analytics Engine NAG Iris Explorer- Data Visualization

Reference Solution Architecture



Note: Grey Text = "Extends Solution" but not required; Blue Text means "Third-party" middleware

Partners & Proof Points	
ISVs	<ul style="list-style-type: none"> Partners: SAP, SunGard, Excelergy, NAG, Moneyline Telerate, Apama, PeopleSoft
Consulting Partners	<ul style="list-style-type: none"> Our Consulting Partners for this solution contribute both implementation services and thought leadership. BCS Business Efficiency, SWG Services Accenture Trading & Settlement Practice



IBM Middleware Solutions for Energy & Utilities - Regulatory Compliance

Summary - Regulatory Compliance Solution

Overview

Problem: New security regulations (NERC Urgent Action 1200), Sarbanes-Oxley, and increasingly complex risks of theft, corruption, destruction and terrorism

Solution: Comprehensive security policy infrastructure with business controls mgmt

Benefits: Compliance with regulatory and government controls, faster reporting and problem-shooting

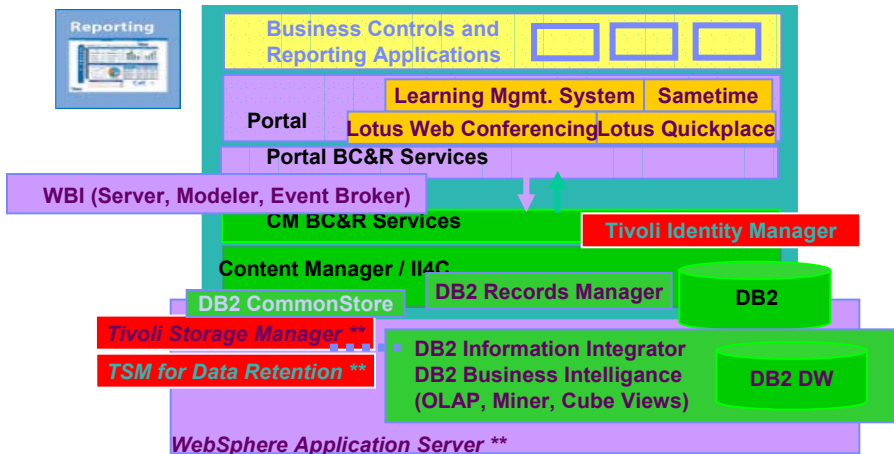
IBM Differentiators

Comprehensive solution that combines both [1] technical security infrastructure with [2] business controls reporting and workflow

Representative Projects - How to Get Started

- | | |
|---|---|
| <ul style="list-style-type: none"> Workplace for Business Controls Security Access and Identity Controls Integrated Directory Document Management | <ul style="list-style-type: none"> Business Integration between key applications Process Modeling and Monitoring Workflow Management |
|---|---|

Reference Solution Architecture



Customers

Encana - security infrastructure, including single sign-on over web, strong authentication; improved productivity for remote employees; secure connectivity to business-critical applications

TXU - document management solution increasing document accessibility and management for government affairs units

Capabilities

Core Capabilities

- | | |
|--|--|
| <ul style="list-style-type: none"> Access & Collaborate Business Modeling Application & Information Integration | <ul style="list-style-type: none"> Secure |
|--|--|

Solution Bill of Materials

Core Products

- DB2 Universal Database
- Lotus Quickplace, Sametime, LearningSpace, Everyplace Suite
- Tivoli Access Mgr, Identity Mgr, Privacy Mgr, Risk Mgr, Directory Integrator
- DB2 Information Integrator, Business Intelligence, Records Manager
- IBM Learning Management System
- IBM Lotus Workflow
- Rational Suite for Auditing

Industry-Specific Middleware

- WebSphere Modeler Workflow
- SAP Portlets
- KPMG Cat Tool

Note: Grey Text = "Extends Solution" but not required; Blue Text means 'Third-party' middleware

Partners & Proof Points

ISVs	Our ISV Partners include: SAP, Hyperion, KPMG, PeopleSoft
Consulting Partners	Our Consulting Partners for this solution contribute both implementation services and thought leadership. <ul style="list-style-type: none"> BCS Financial Transformation, Security Consulting Practices Bearingpoint – Security, Financial Business Controls/Sarbanes-Oxley KPMG, Deloitte, Accenture (Security, Fin Transformation practices)

SAFE addresses common solution issues

Common Solution Issues Solution Architecture Benefits

Communication & Teamwork → User Experience Integration: *WS Portal*

On-going Business Changes → Continuous Process Improvement: *WBI Modeler*

Disconnected Applications → Collaborations: *WBI Accelerators*

Inefficient Processes → Enterprise Application Integration: *MQ WorkFlow & ICS*

Disparate Process Techniques → SOA & Process Federation: *WebSphere V5.02*

Real-Time Operational Visibility → Workflow Dashboard: *WBI Monitor*

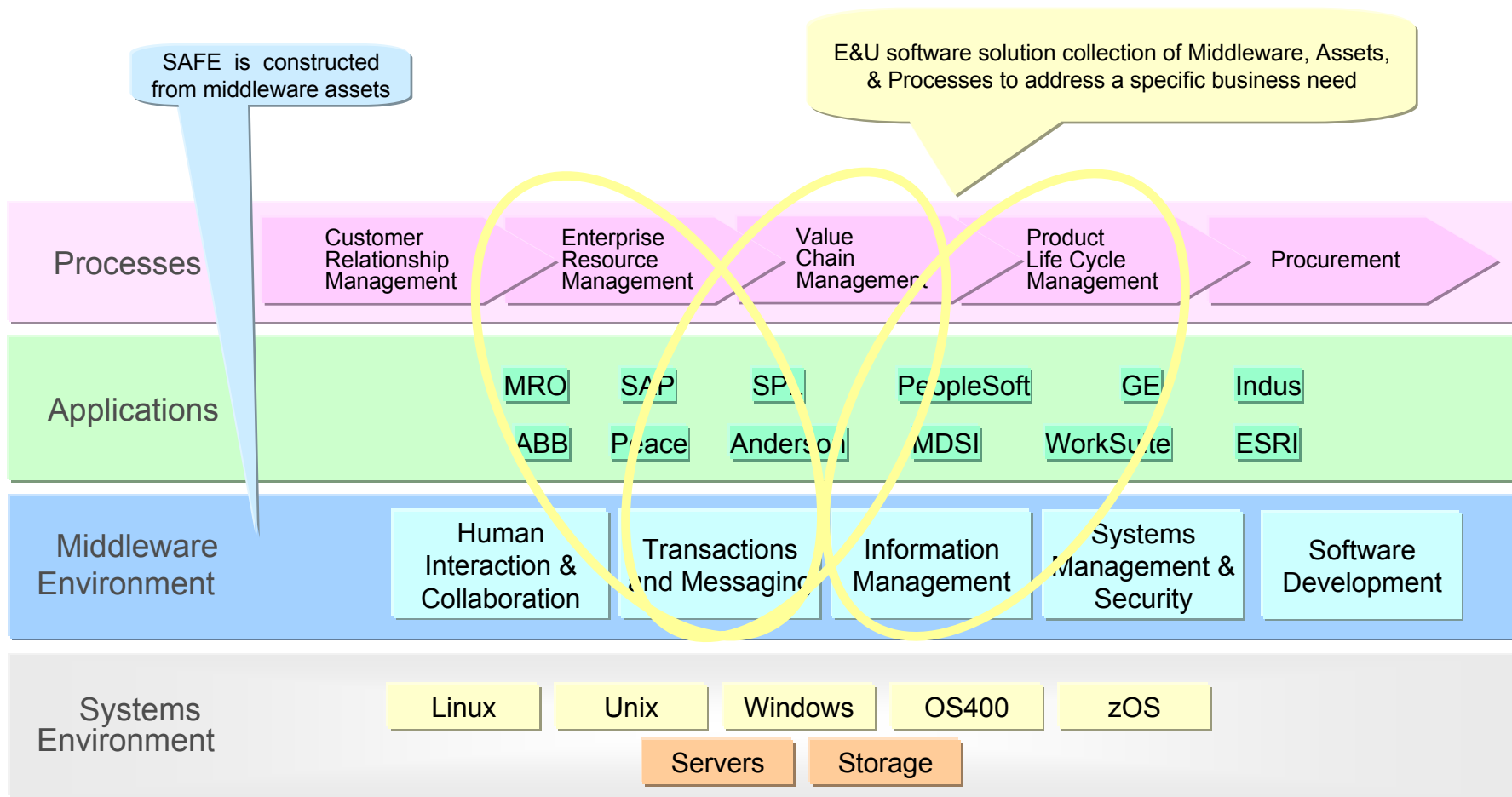
Inefficient Device Acc. & Controls → Message Brokering: *WMQI Broker / Arcom*

Disparate Information Sources → Data Integration: *DB2-Information Integrator*

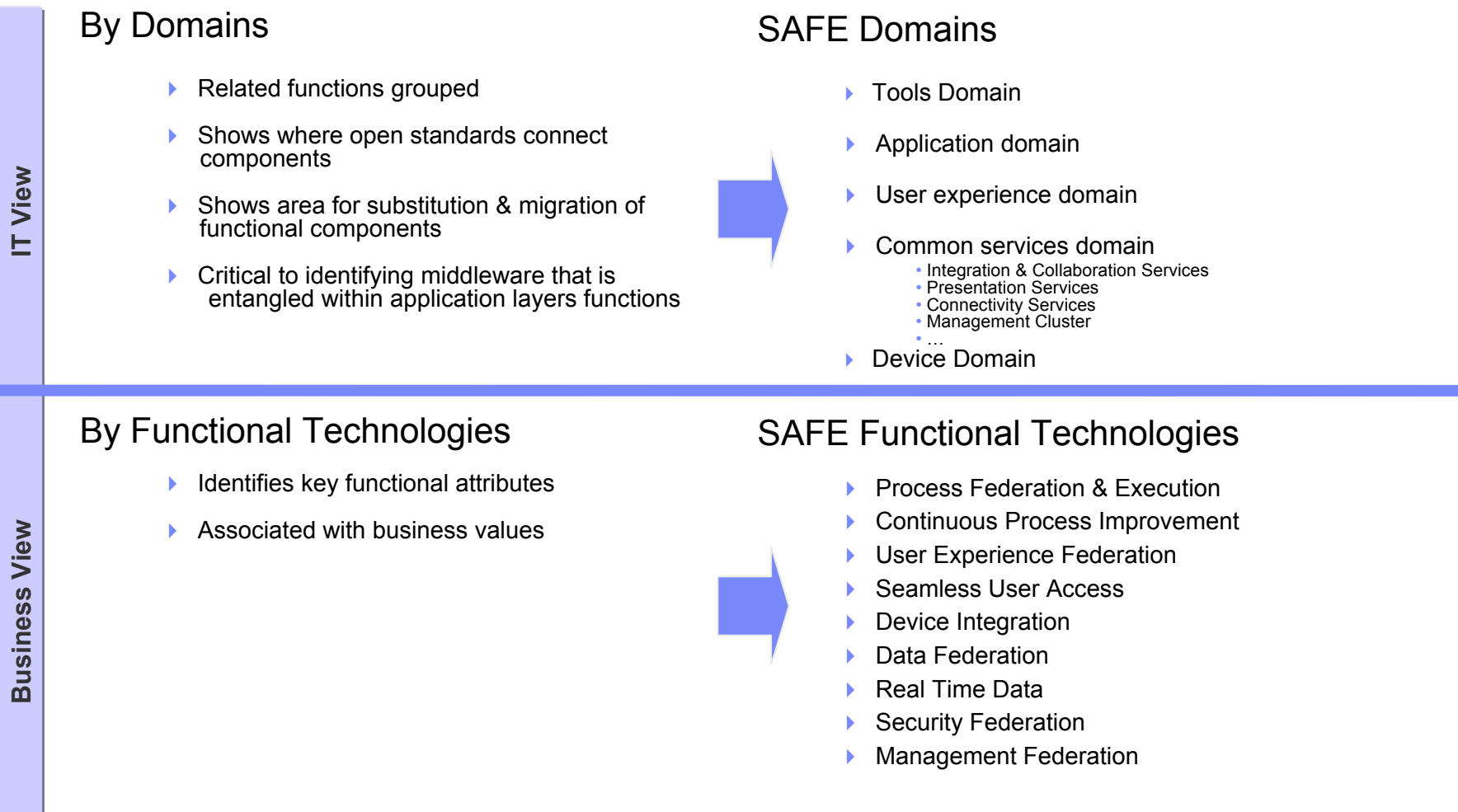
Disconnected / Mobile Workforce → Device Access & Connection Mgt: *WEA & WECM*

Disparate Data & Access Security → Centralized Security Management: *Tivoli Security Solutions*

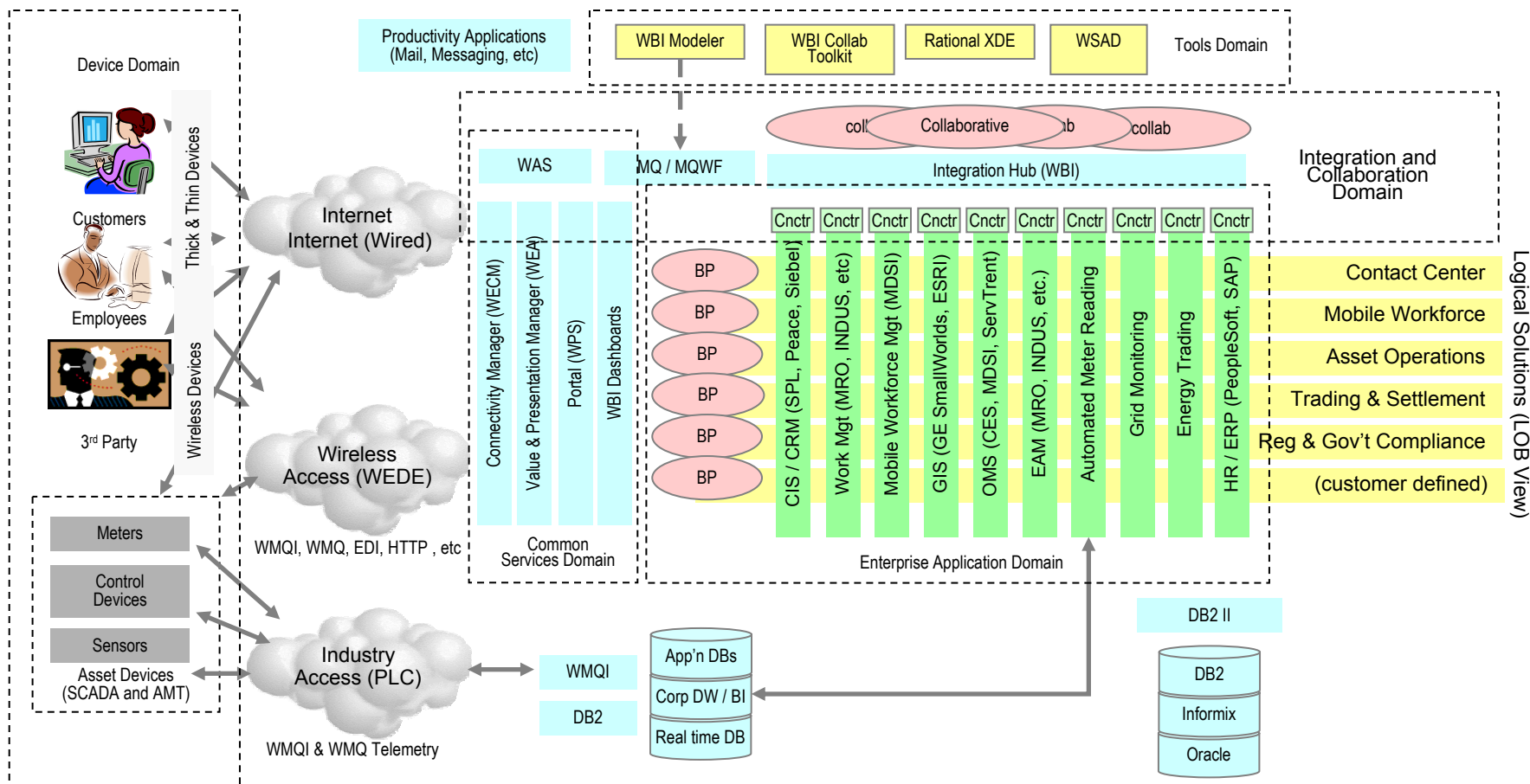
Value Proposition of BEST “Blue Energy Solution Template”



Two ways to evaluate solution architecture elements



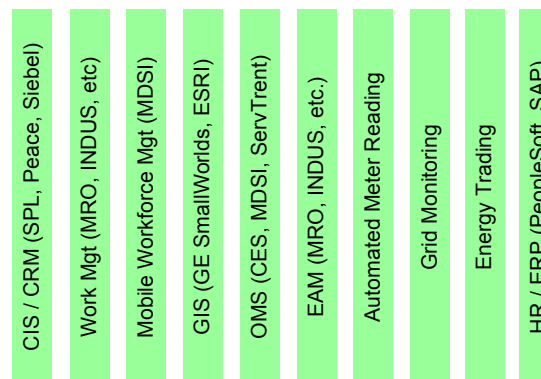
IT domains (e.g. Common Services, Device and Tools) contain functionally related components and facilitate best practices and reuse



Enterprise applications are highly specific industry functions

- ▶ Usually legacy, mission critical, and serve specific functions:
 - inventory
 - payroll
 - work dispatch
 - customer accounts
 - design activities
 - etc
- ▶ Typically EAs have their own data repositories (not pictured)
- ▶ EAs are frequently characterized as being standalone
- ▶ EAs usually require human intervention to update information in adjacent EAs where that information is required in more than one system

Industry Vertical Applications (IT View)



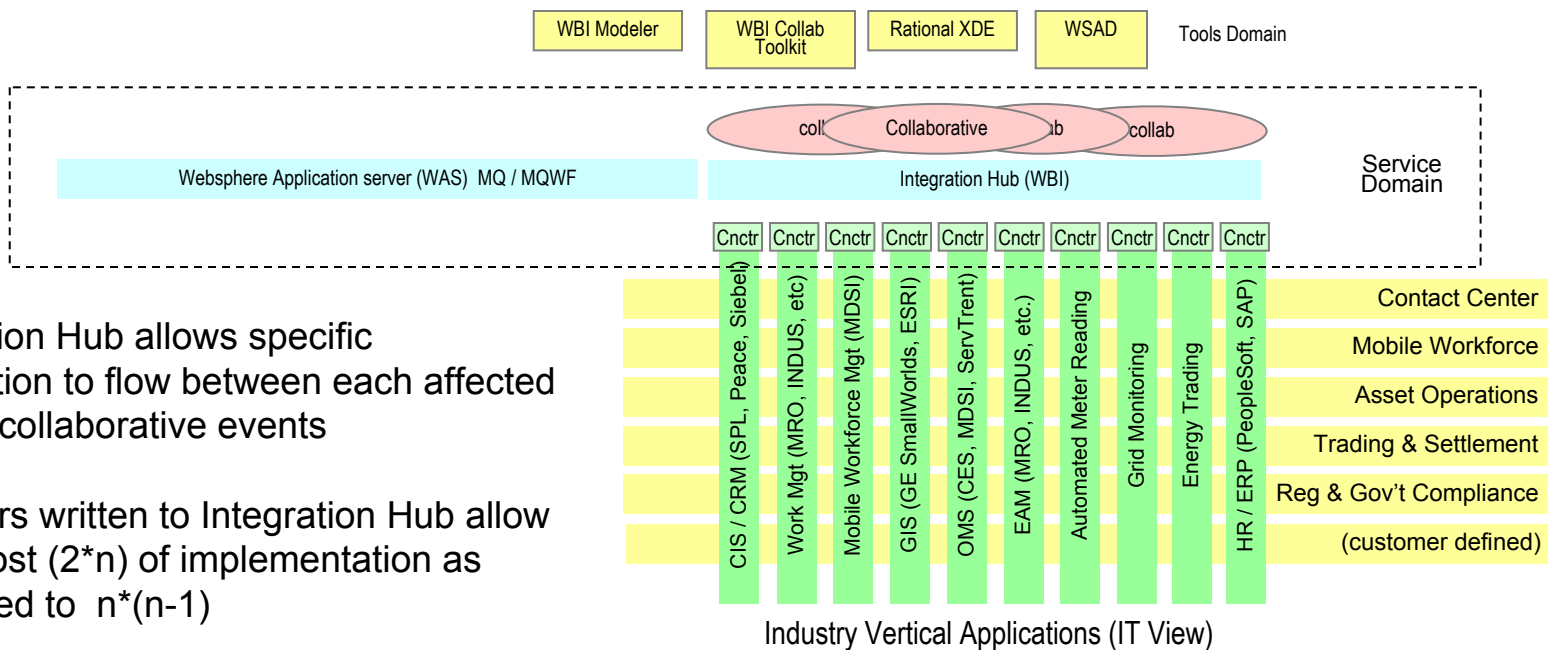
Industry Apps need a common infrastructure

- ▶ Industry Solutions need to interact with multiple Industry Applications
- ▶ Common “objects” form the basis EAI integration
 - Customer “User”
 - Asset
 - Work Order / Problem Ticket
 - Energy Allocation
 - Billing Record
- ▶ Industry Applications communicate through the Service Bus
- ▶ Customer Defined Projects will have the same characteristics

	CIS / CRM (SPL, Pease, Siebel)	Work Mgt (MRO, INDUS, etc)	Mobile Workforce Mgt (MDSI)	GIS (GE SmallWorlds, ESRI)	OMS (CES, MDSI, ServTrent)	EAM (MRO, INDUS, etc.)	Automated Meter Reading	Grid Monitoring	Energy Trading	HR / ERP (PeopleSoft, SAP)	
	✓	✓					✓			✓	Contact Center
	✓	✓	✓	✓		✓	✓			✓	Mobile Workforce
		✓	✓		✓	✓	✓	✓	✓		Asset Operations
		✓			✓		✓	✓	✓		Trading & Settlement
	✓	✓		✓	✓			✓	✓	✓	Reg & Gov't Compliance
	?	?	?	?	?	?	?	?	?	?	(customer defined)

Industry Vertical Applications (IT View)

Service Domain allows specific information to flow between affected EAs



- ▶ Integration Hub allows specific information to flow between each affected EAs as collaborative events
- ▶ Adapters written to Integration Hub allow lower cost (2*n) of implementation as compared to n*(n-1)
- ▶ WBIEU (sometimes referred to as “Energy Hub”) is an E&U specific adapters / tool collection designed to accelerate development and deployment

WebSphere Business Integration Adapters (WBIA) supports multiple releases and application transaction types

Application Adapters

- ▶ Ariba Buyer
- ▶ BroadVision Commerce**
- ▶ Clarify CRM
- ▶ eMatrix
- ▶ IndusConnect Framework*
- ▶ I2
- ▶ I2 Active Data Warehouse
- ▶ Maximo MEA*
- ▶ MetaSolv Application
- ▶ mySAP.com
- ▶ NightFire Applications
- ▶ Oracle Applications
- ▶ PeopleSoft
- ▶ Portal Infranet
- ▶ QAD MFG/PRO*
- ▶ Retek
- ▶ Siebel eBusiness Applications
- ▶ Spirent Applications
- ▶ Telcordia Applications
- ▶ Vantive**
- ▶ WebSphere Commerce

Technology Adapters

- ▶ COM*
- ▶ CORBA*
- ▶ e-mail
- ▶ Exchange*
- ▶ FIX Protocol
- ▶ Healthcare Data Protocols*
- ▶ iSeries*
- ▶ JMS
- ▶ JText
- ▶ JDBC
- ▶ Lotus Domino*
- ▶ MQ
- ▶ MQ Integrator Broker
- ▶ MQ Workflow
- ▶ SWIFT
- ▶ XML

Mainframe Adapters

- ▶ ADABAS
- ▶ CICS
- ▶ DB2 Databases
- ▶ IDMS Database*
- ▶ IMS Transaction Manager
- ▶ IMS Database Manager
- ▶ Natural*
- ▶ VSAM

e-Business Adapters

- ▶ Trading Partner Interchange
 - Solo
 - On-Ramp
 - Trading Networks
- ▶ iSoft Peer to Peer Agent
 - Express
 - Advanced
 - Enterprise
- ▶ Data Handler for XML
- ▶ Data Handler for EDI
- ▶ Web Services

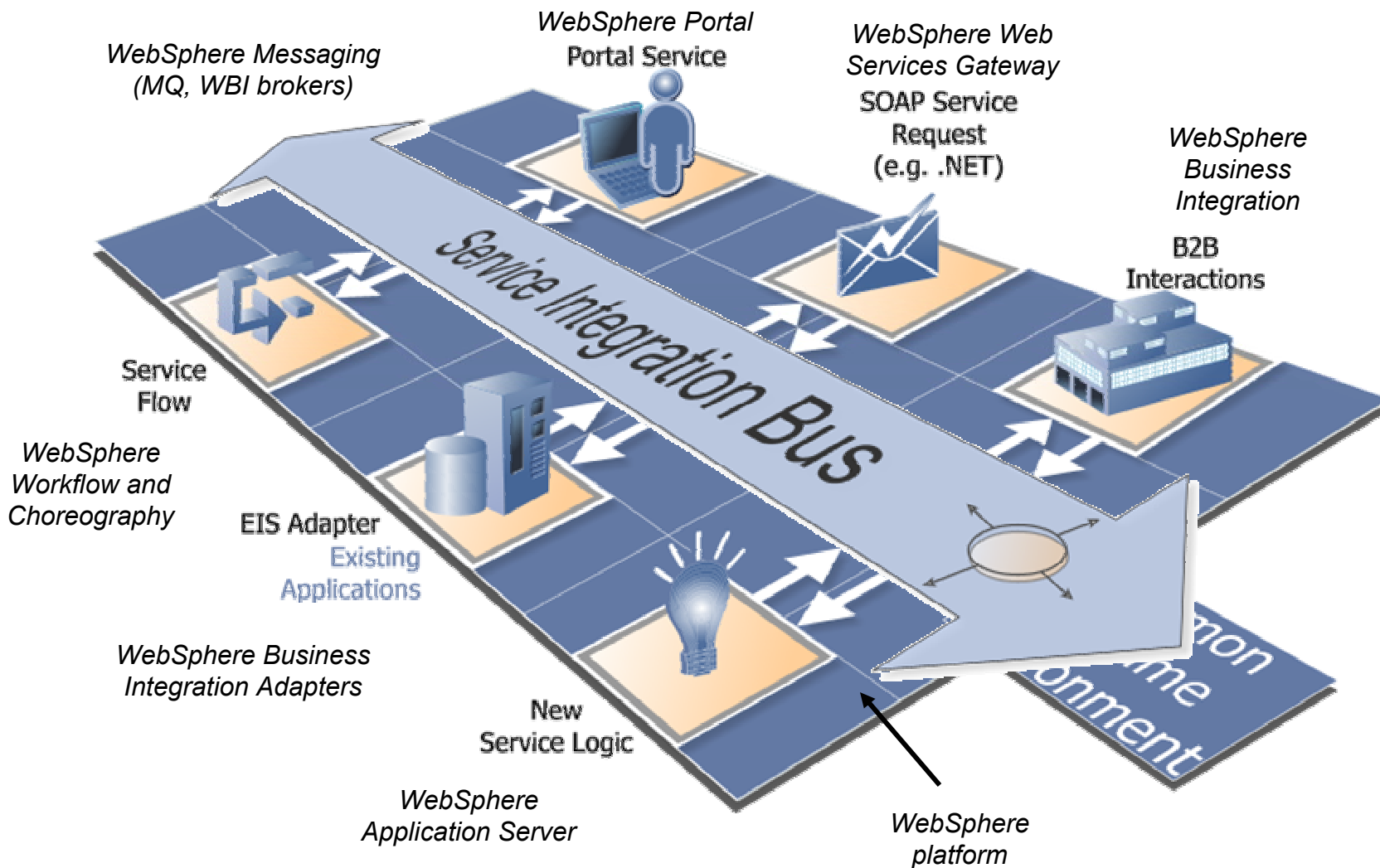
* Available: 07/31/03

** Withdrawn: 9/22/03

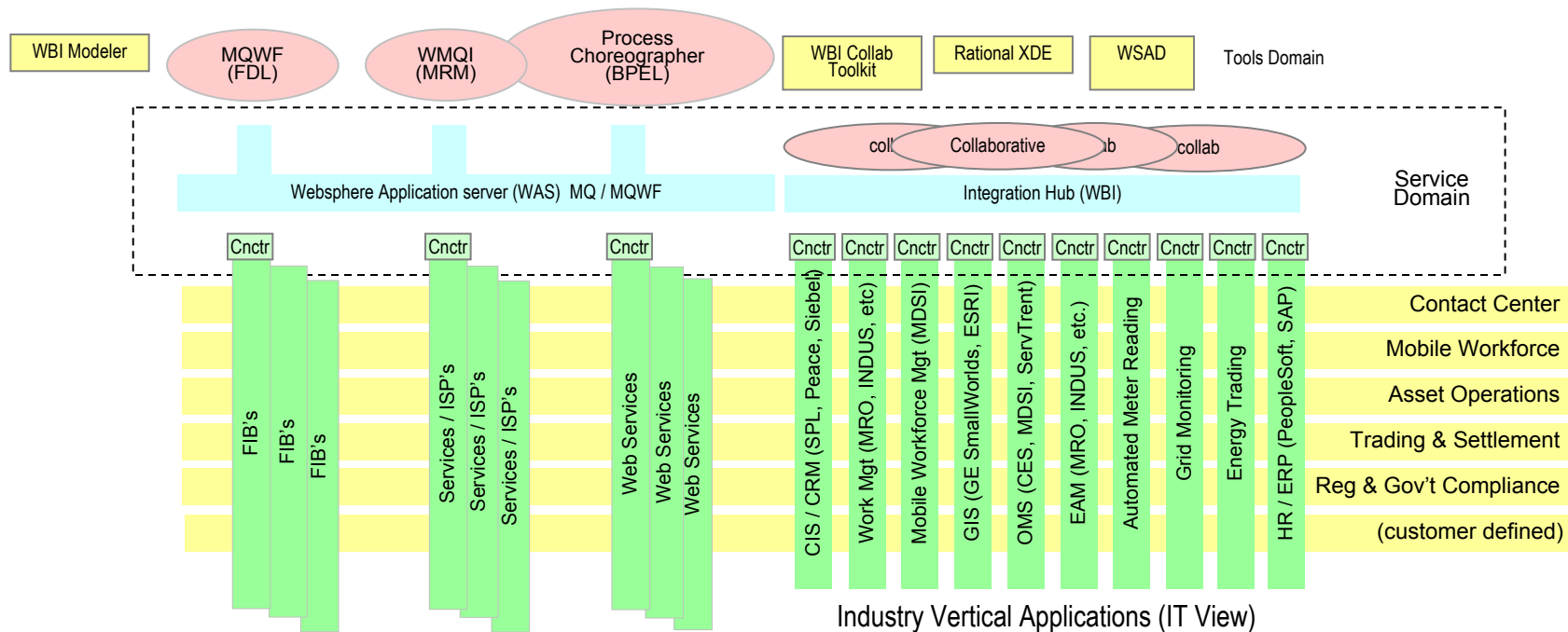
WBI adapters supported in existing products or via service packs *(www-3.ibm.com/software/integration/wbiadapters/indusconnect)*

Category	Brand	Application	Support *Subject to change	Cost - Passport License G Per Instance
CIS	Peace	Energy(tm)	Service Pack (Sep2003)	
CIS	SPL		(Possible Future Candidate)	
EAM	Indus	Connect Framework R9.0.3	GA (June 2003)	\$74k
EAM	MRO	Maximo MEA v5.1 patch 359	GA (June 2003)	
EAM	SAP	Asset	GA	
ERP	Anderson	Customer One	GA (Mainframe Adapter)	
ERP	PeopleSoft	HR & Finance v8.4, 8.1, 7.5	GA	\$74K
ERP	SAP	HR & Finance	GA	
EMS	ABB	Ranger/Spider™ CADOPS	Service Pack (Dec2003)	\$35K for app instance + \$15K for maintenance
GIS	GE	SmallWorlds	Service Pack (Dec2003)	\$35K for app instance + \$15K for maintenance
GIS	ESRI	ArcGIS™ - Spatial DB Adapter ARC SDE 8.2	GA (December 2003), was SP	
GIS	Intergraph		(JDBC Tech Adapter)	\$39K for app instance
Market	ABB	SABLE™ CADOPS	Service Pack (Dec2003)	\$35K for app instance + \$15K for maintenance
MWF	MDSI	Advantex™ v7.4	Service Pack (Oct2003)	\$35K for app instance + \$15K for maintenance
OUTAGE	WorkSuite (SeverntTrent)	Storms 3.3 Storms 3.4	Service Pack (JDBC Technology Adapter)	
WF	CES	Centricity Gateway v1.5	GA (December 2003), was SP	*

Service Oriented Architecture and WebSphere

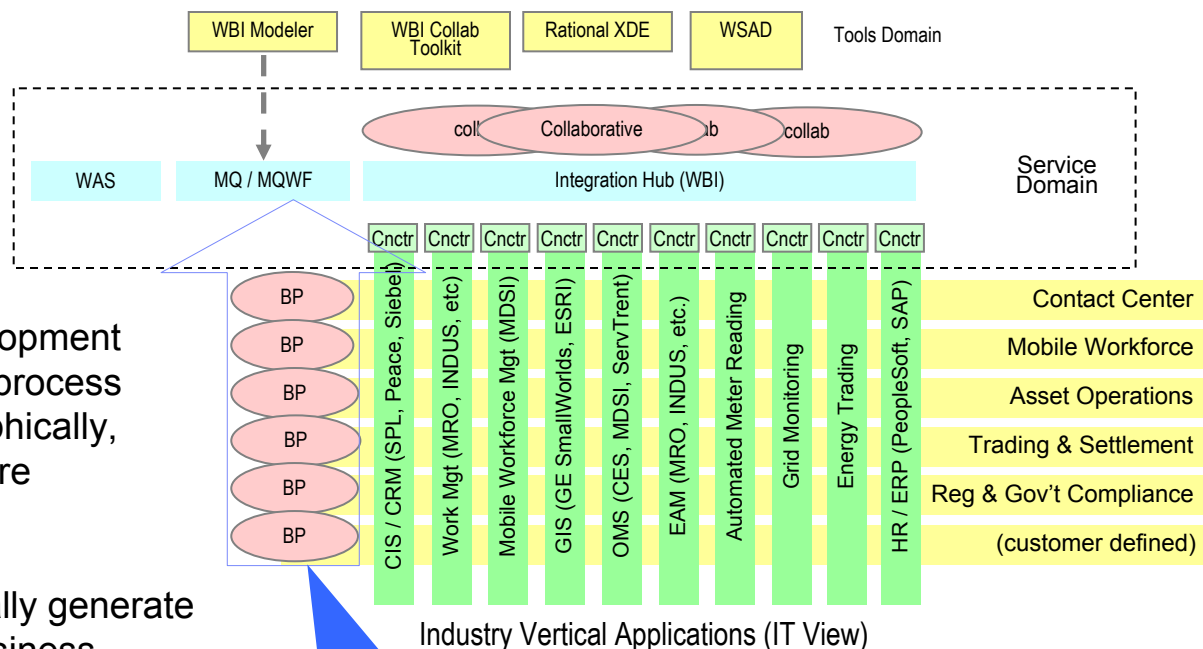


Service Bus Domain extends the WBIEU reach



- ▶ Business Objects (EJBs, Servlets / JSPs, and Web Services) can participate in process & collaboration activity through IBM's application base (WAS) via the Service Oriented Architecture (SOA)

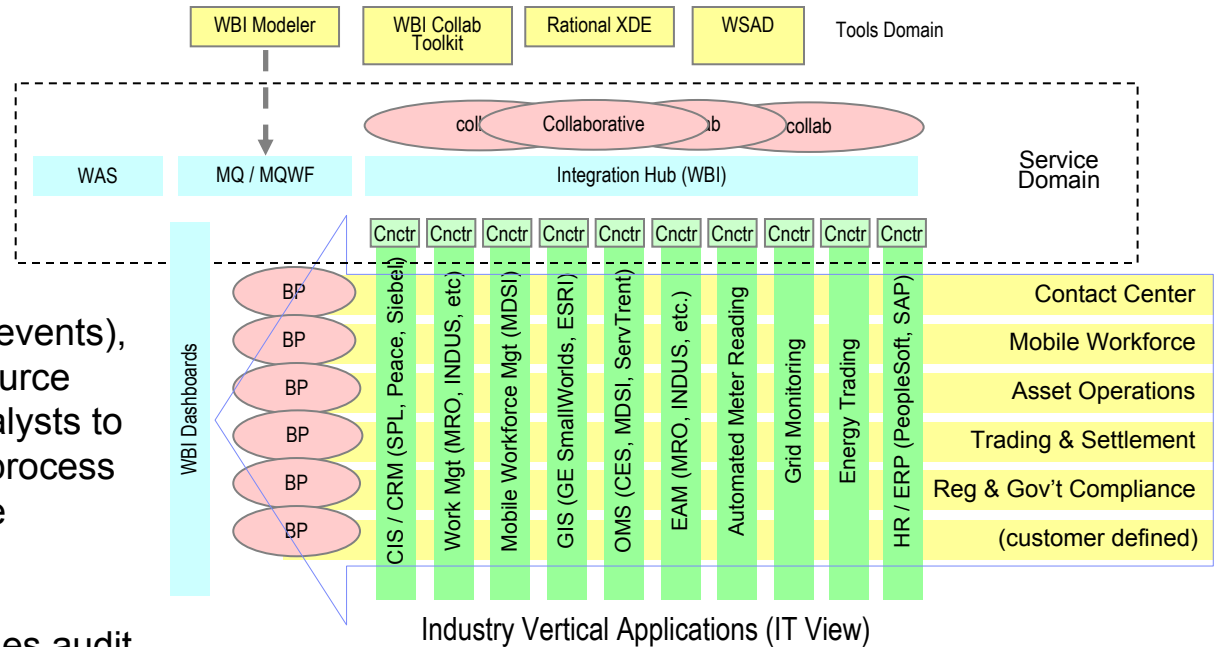
WBI Modeler creates and simulates business processes



- ▶ WBI Modeler & WSAD development environment allow business process definitions to be created graphically, simulated and analyzed before deployment
- ▶ WBI Modeler can automatically generate a business case to justify business process changes
- ▶ Business process (BPs) models drive Business Solution (LOB) and application (IT) views

FDL exported by WBI Modeler is MQWF deployment form

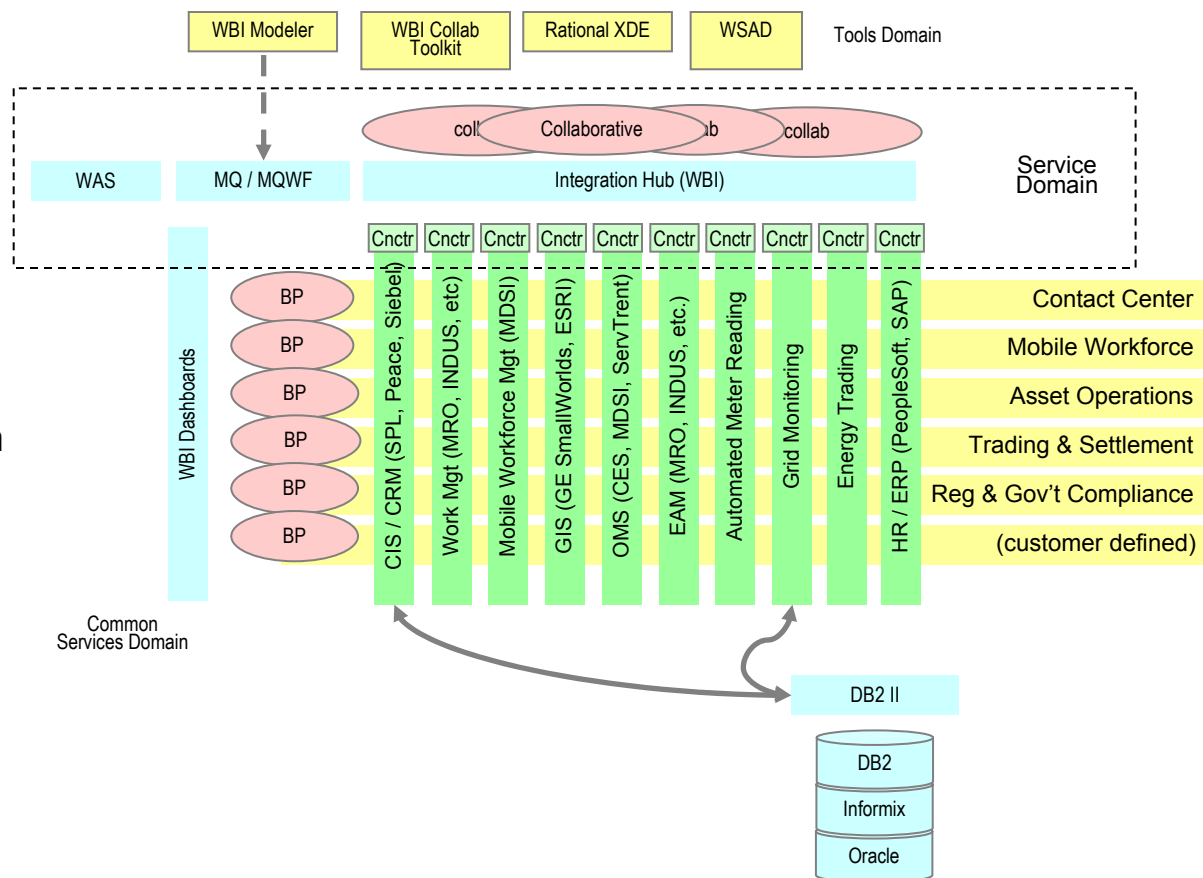
WBI Monitor provides real-time business solution event view



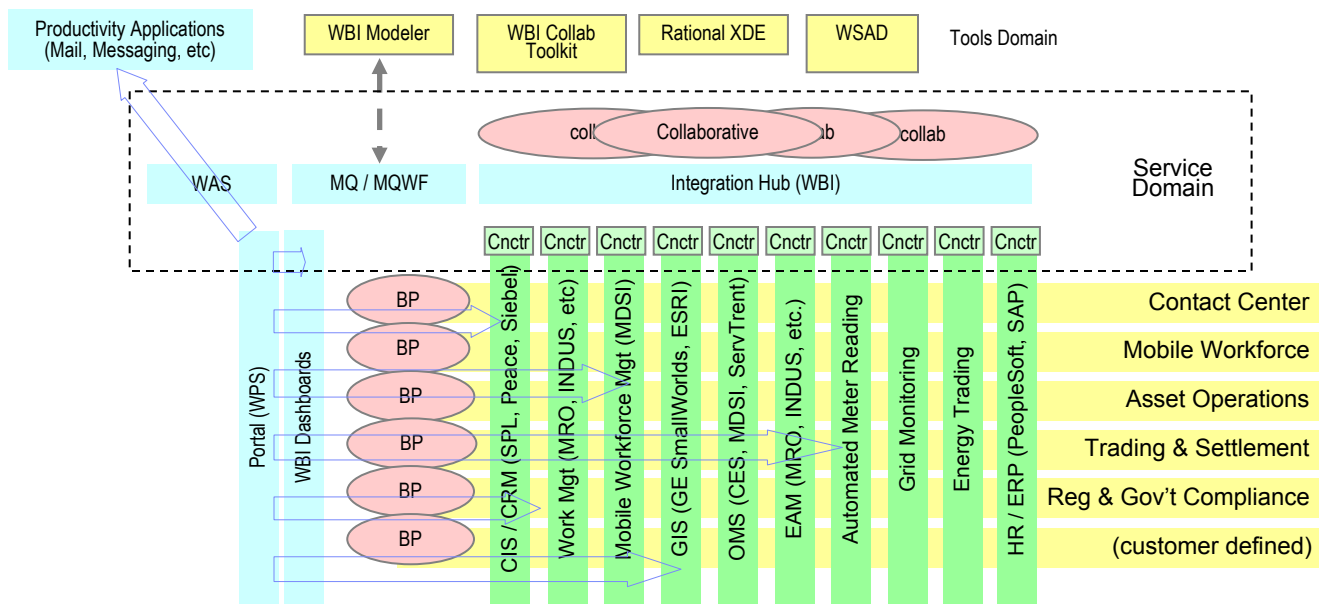
- ▶ Status of KPIs (key process events), workload backlogs, and resource utilization allow business analysts to minimize impact of nominal process breakages reducing real time business operation cost
- ▶ Monitor data collected provides audit trail and serves as statistical base for on-going process modeling changes
- ▶ Business analysts and IT developers use monitor data to validate model effectiveness

DB2 II integrates real-time information mitigating painful and costly migration projects

- ▶ Access information in disparate structured and unstructured database technologies (i.e. Mergers & Acquisitions)
- ▶ DB2 II allows database technology to be hidden from applications (e.g. app requiring data in DB2 format might actually retrieve that data from Oracle database)
- ▶ Information may be dynamically joined (regardless of format) in real time eliminating need for off-shift ETL

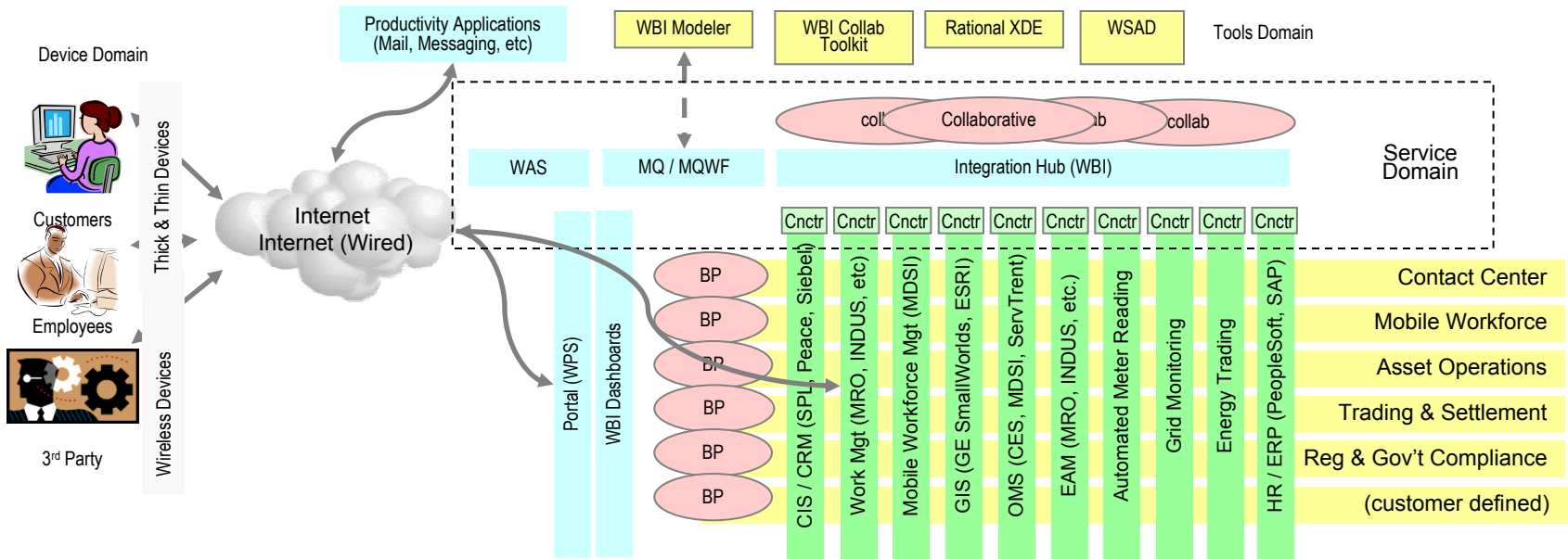


Application portal (WPS) facilitates collection and role based authorization for appropriate applications



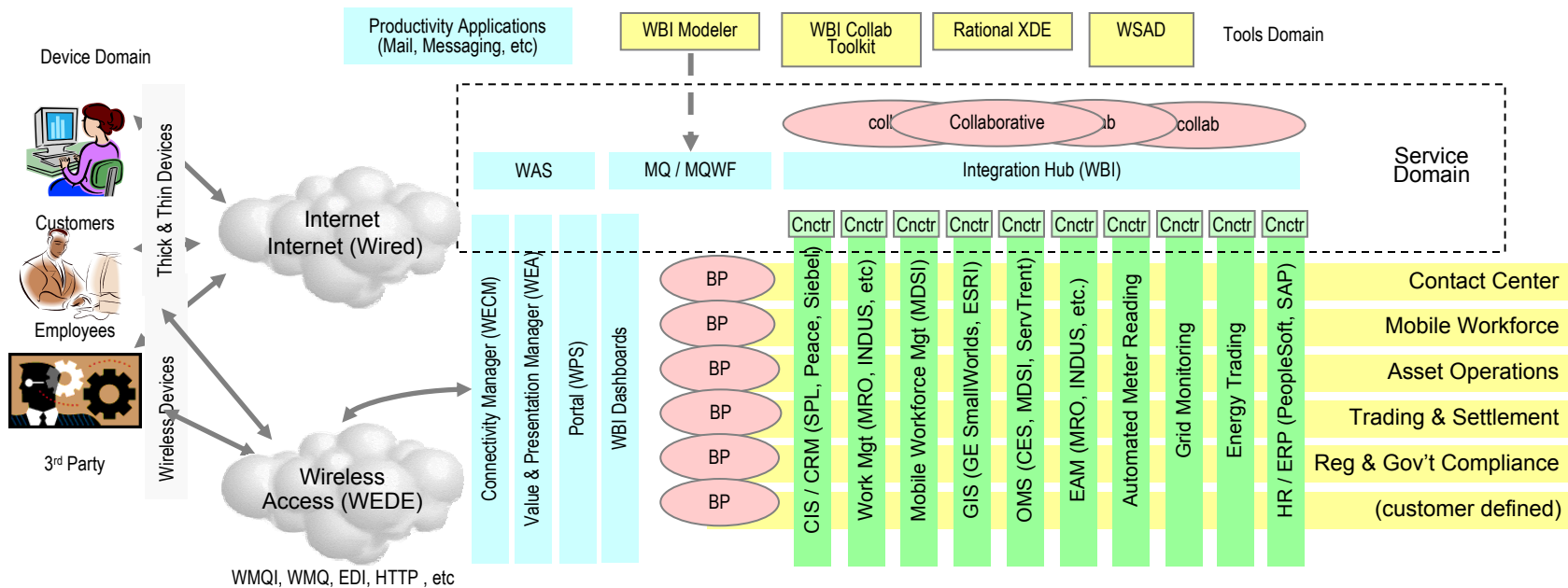
- ▶ Portlets enable access to industry vertical applications & horizontal productivity applications (e-mail, messaging, web applications)
- ▶ Executive Dashboard portlets create a work environment that is LOB Solution focused.

Employees, customers & 3rd Party partners access applications through portal or conventional protocols



- ▶ WebSphere Application Server (WAS) provides infrastructure for thick and thin client access

Wireless access provides flexibility in how employee, customers, and partners access rich IT resources

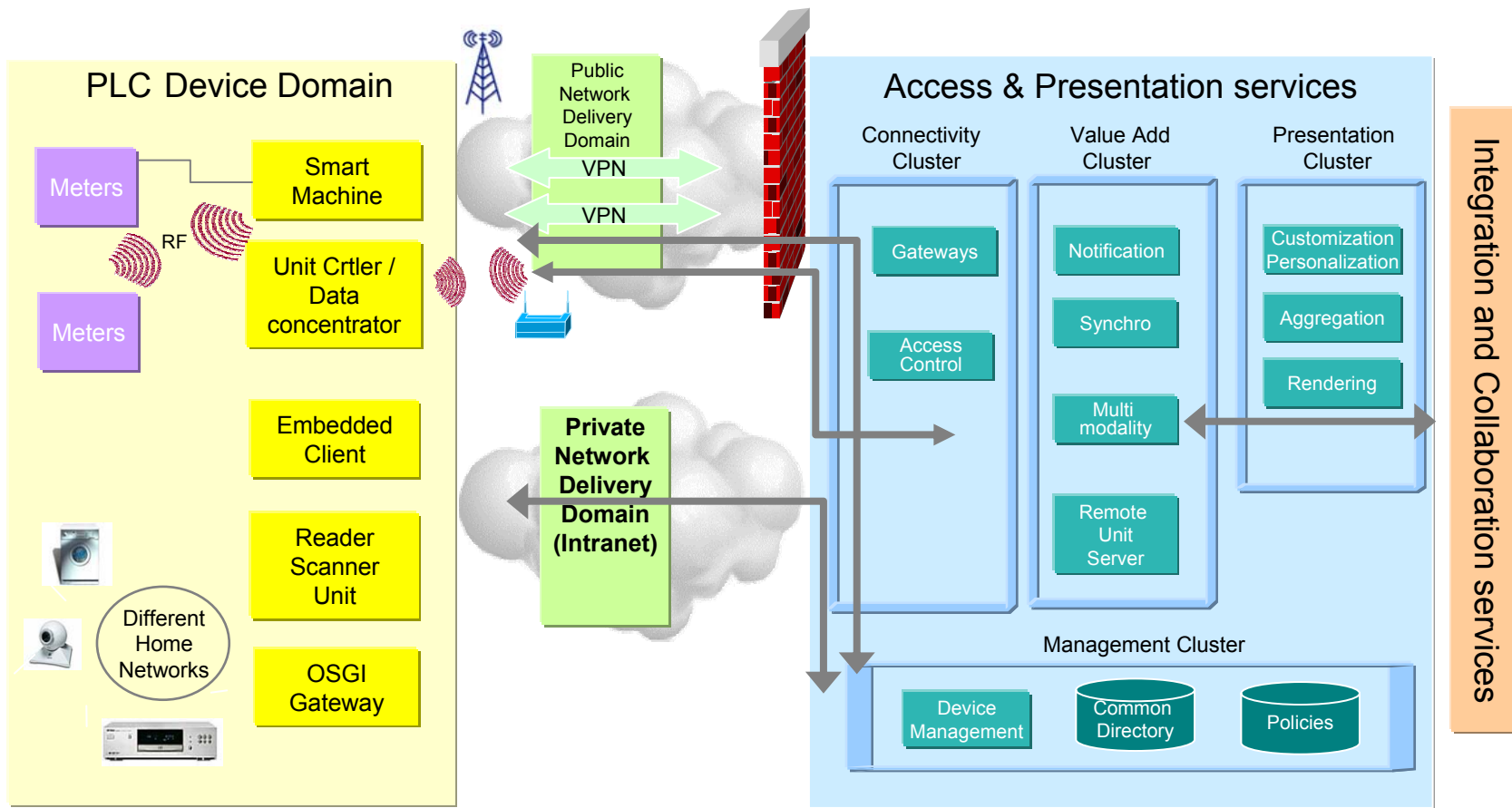


- ▶ Wireless infrastructure providing wide range of device access to multiple back-end applications through the integration hub or by extending portal capabilities

- <http://www-1.ibm.com/industries/wireless/doc/content/landing/905017104.html>
- <http://w3-3.ibm.com/wireless/pvc.nsf/ContentDocsByTitle/Workforce+Mobility>

- ▶ Provides rich interaction capabilities with employees third-party by providing intelligent notification capabilities, synchronization on their devices for off-line work, location aware application.

Focusing device domain on smart equipment & intelligent gateways

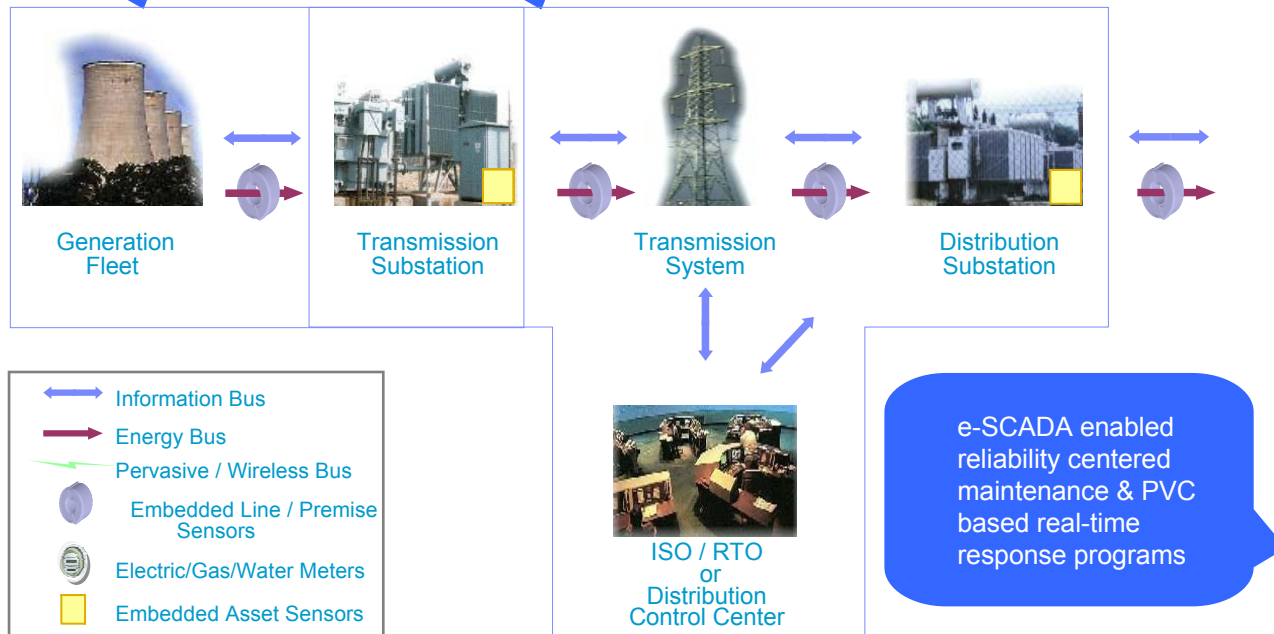


Capturing real-time information from assets significantly increases E&U value chain operational efficiency / decisions

Embedded sensor fabric throughout network enables condition-based asset monitoring programs

Business integration enables rewards in competitive markets via real-time response to fluctuating market conditions

AMT-based Demand Response Programs



- Information Bus
- Energy Bus
- Pervasive / Wireless Bus
- Embedded Line / Premise Sensors
- Electric/Gas/Water Meters
- Embedded Asset Sensors

Industrial Customer

Residential Customer

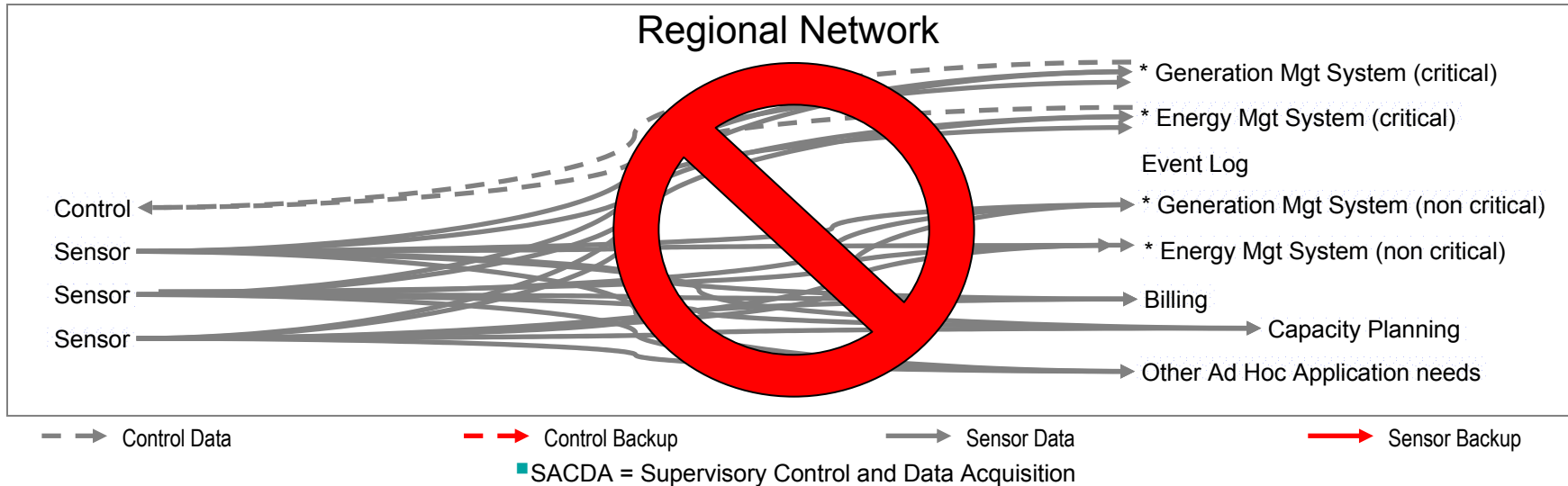
Distribution System

"On-Demand" Response

Mobile Field Force

e-SCADA enabled reliability centered maintenance & PVC based real-time response programs

Typical SCADA Systems Today have scalability & cost issues



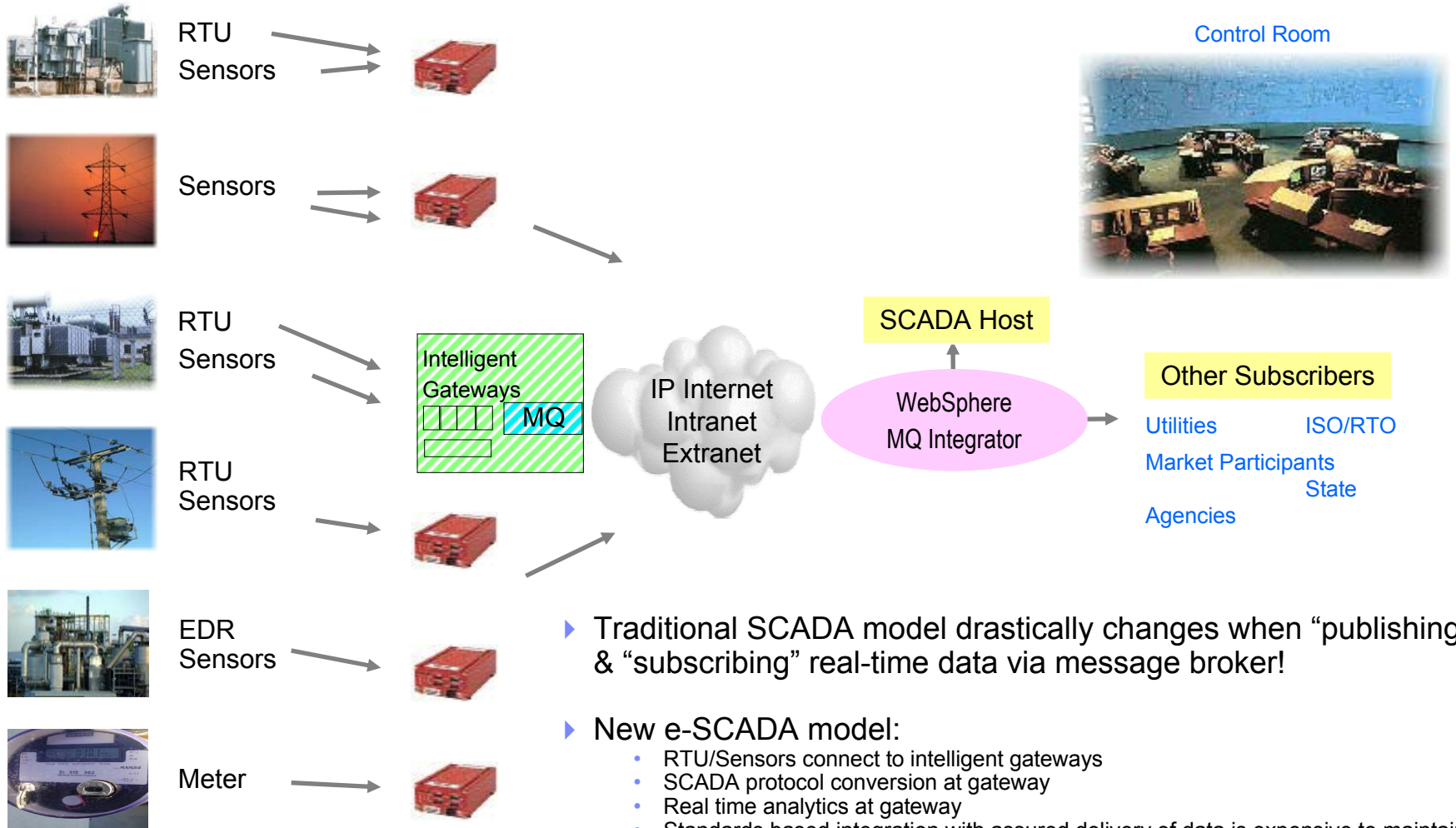
▶ Each application talks to each control device or sensor over a dedicated leased line

- Additional applications need new leased line (and sometimes additional devices)
- Redundant control centers require duplicate leased lines (and additional devices)

▶ Issues:

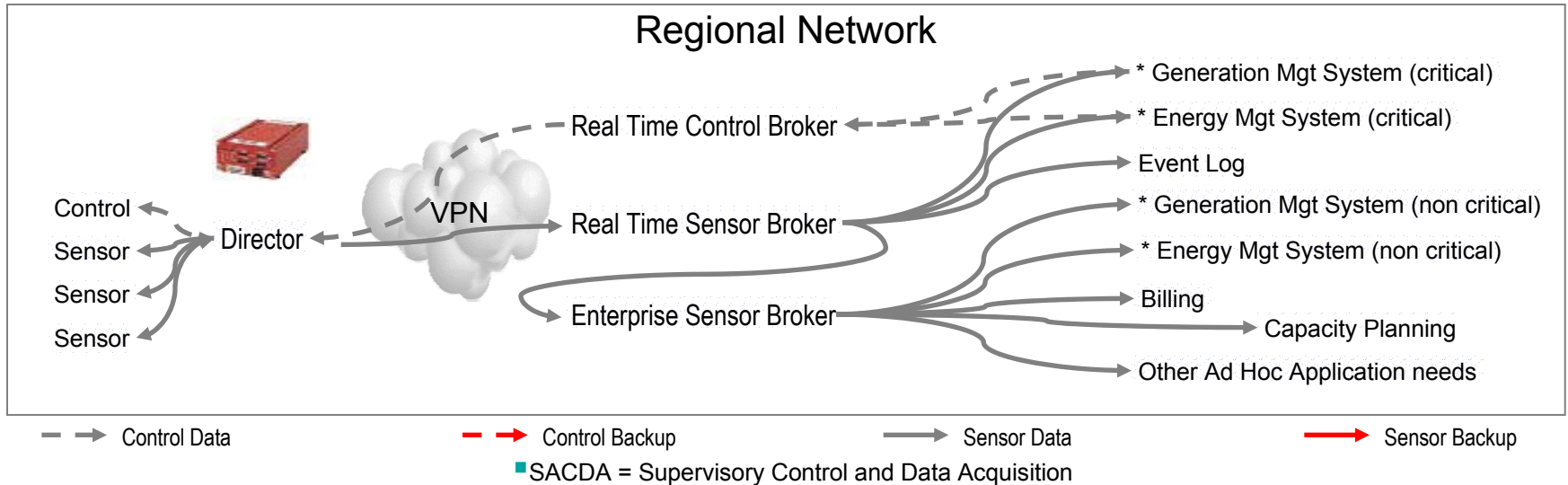
- Expensive to maintain
- Proprietary Device Protocols
- Inflexible
- Scalability

Arcom Controls uses IBM's WBI SCADA device protocol and WebSphere Message Broker product for asset monitoring



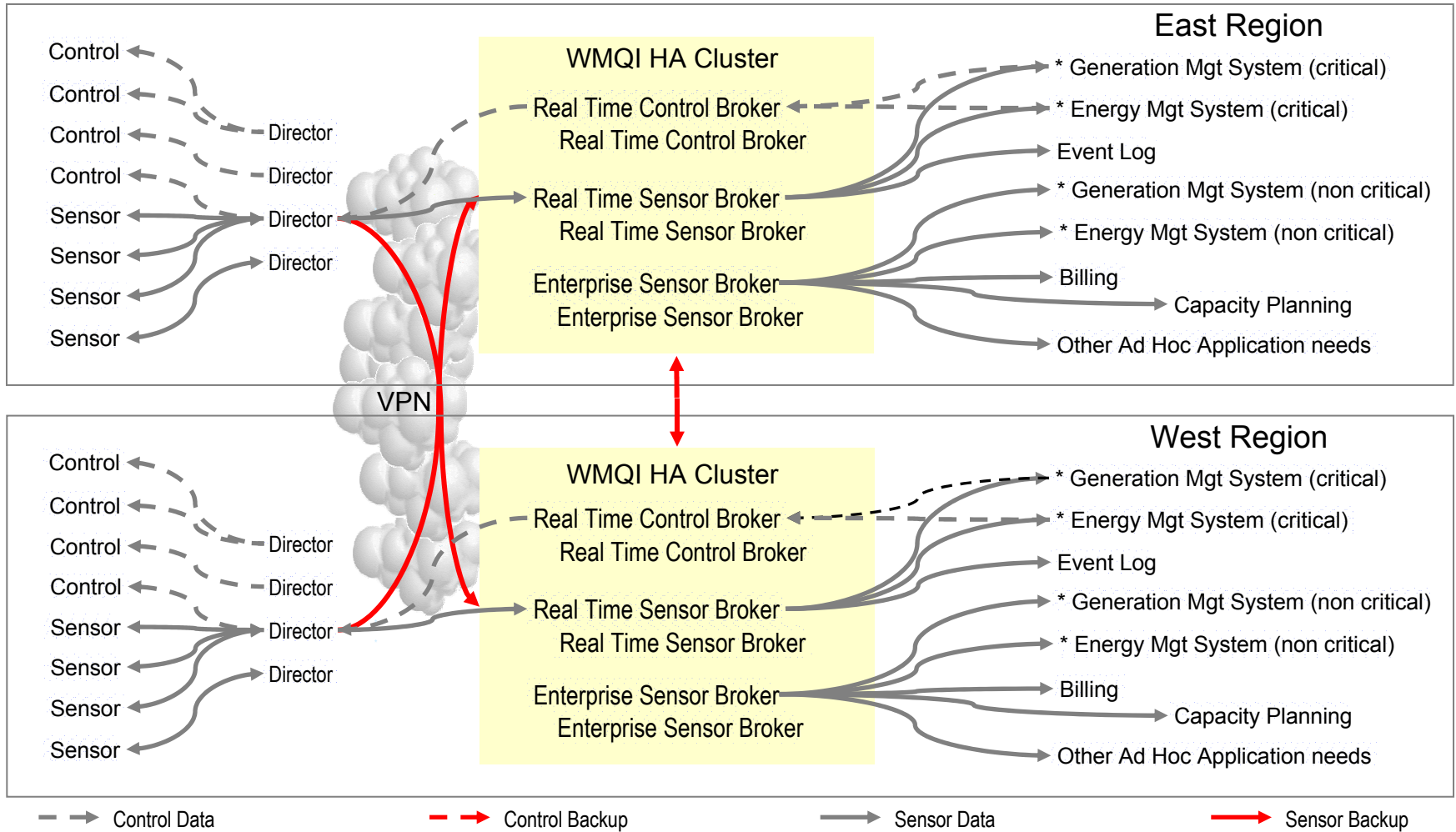
- ▶ Traditional SCADA model drastically changes when “publishing” & “subscribing” real-time data via message broker!
- ▶ New e-SCADA model:
 - RTU/Sensors connect to intelligent gateways
 - SCADA protocol conversion at gateway
 - Real time analytics at gateway
 - Standards based integration with assured delivery of data is expensive to maintain

eSCADA services enables devices to talk through single IP connection

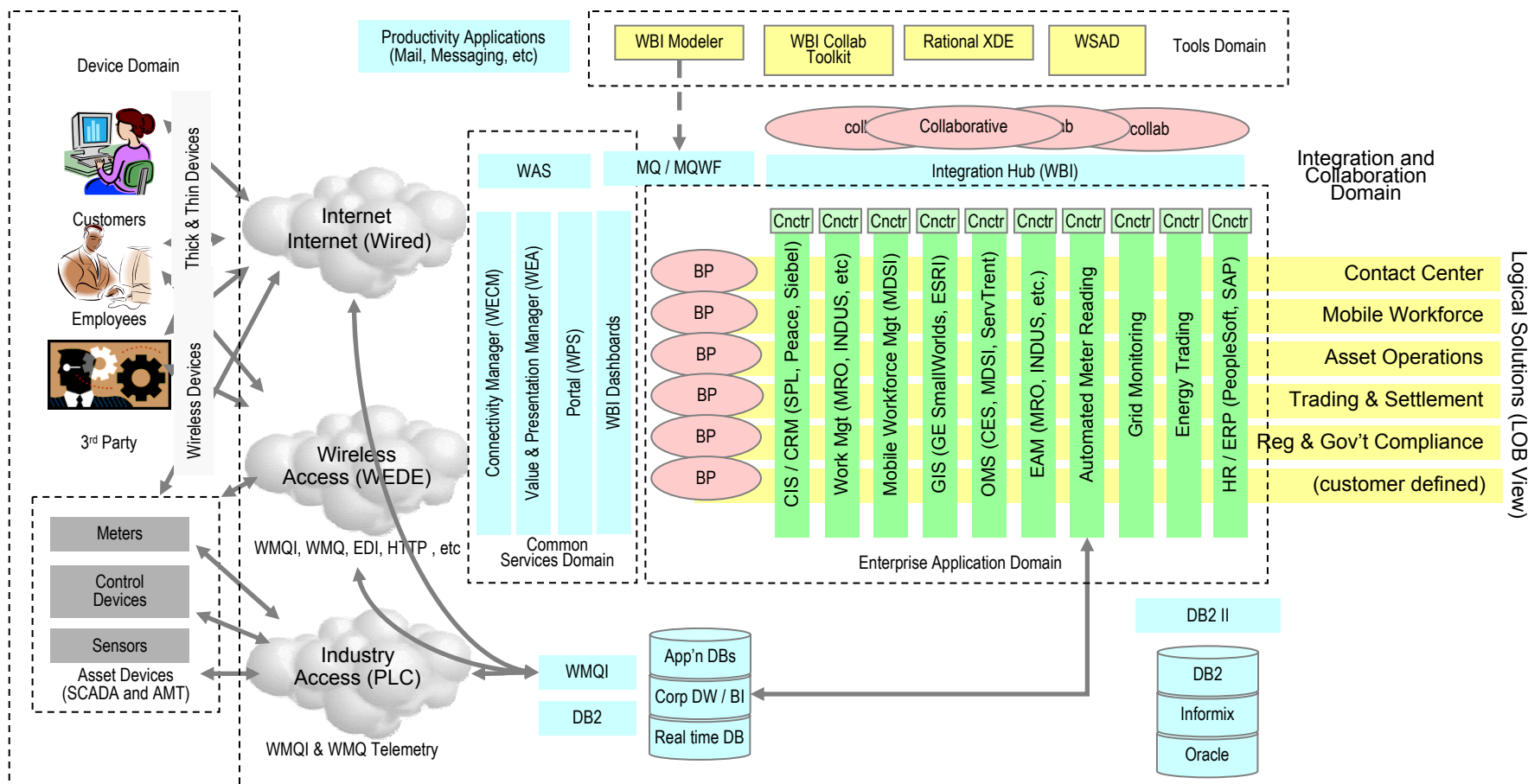


- ▶ Real-time operations and line cost is not impacted by number of devices subscribing to Enterprise Sensor Broker

Redundant high availability back-up center is supported by adding subscribers to Director & WMQI brokers in a cluster



IT domains (e.g. Common Services, Device and Tools) contain functionally related components and facilitate best practices and reuse



Solution Architecture for Energy (SAFE) allows on-going E&Us to smoothly integrate significant software enhancements

- ▶ **IBM's on-demand E&U enterprise vision**
 - SAFE is an architecture... not a specific product

- ▶ **Scalable framework**
 - Utilizes open standards - component choice freedom and flexibility
 - Supports latest software technology advances
 - Embraces leading industry application offerings
 - Leverages cross industry and E&U best practices

- ▶ **Protects customer investment**
 - Embraces customer's applications with middleware infrastructure
 - Enables interchangeable component / product integration
 - Supports SOA - integrating web services and external process engines
 - Implementation staged as needed

Thank You !!!