
NGN Operation Support System

2001. 12.

Overview



 **OSS** /



 **OSS**

 **OSS Interconnection**

 **NGN**

 **NGOSS Architecture & Requirements**

 **NGOSS Functional Architecture & Design**



1.



 **Monopolies -> Open Markets**

 **Circuit/Voice -> IP/Data**

 **Fixed -> Mobile**



 **Business Environment**

- **Unordered, Unpredictable, Uncontrolled**

 **Customer Needs Unknown**

- Personal Information Service
- Multimedia Content Delivery

 **Value Chains (Ever-Changing)**

- Location Based Services
- Web-based Service Orders
- Video Streaming Service

 **B2B Relationship**

1. ()

 Internet (Cross Domain)

 NMS – (Telecom & Data Network)

 OSS – NGOSS

 OAM – Proprietary

OSS ()

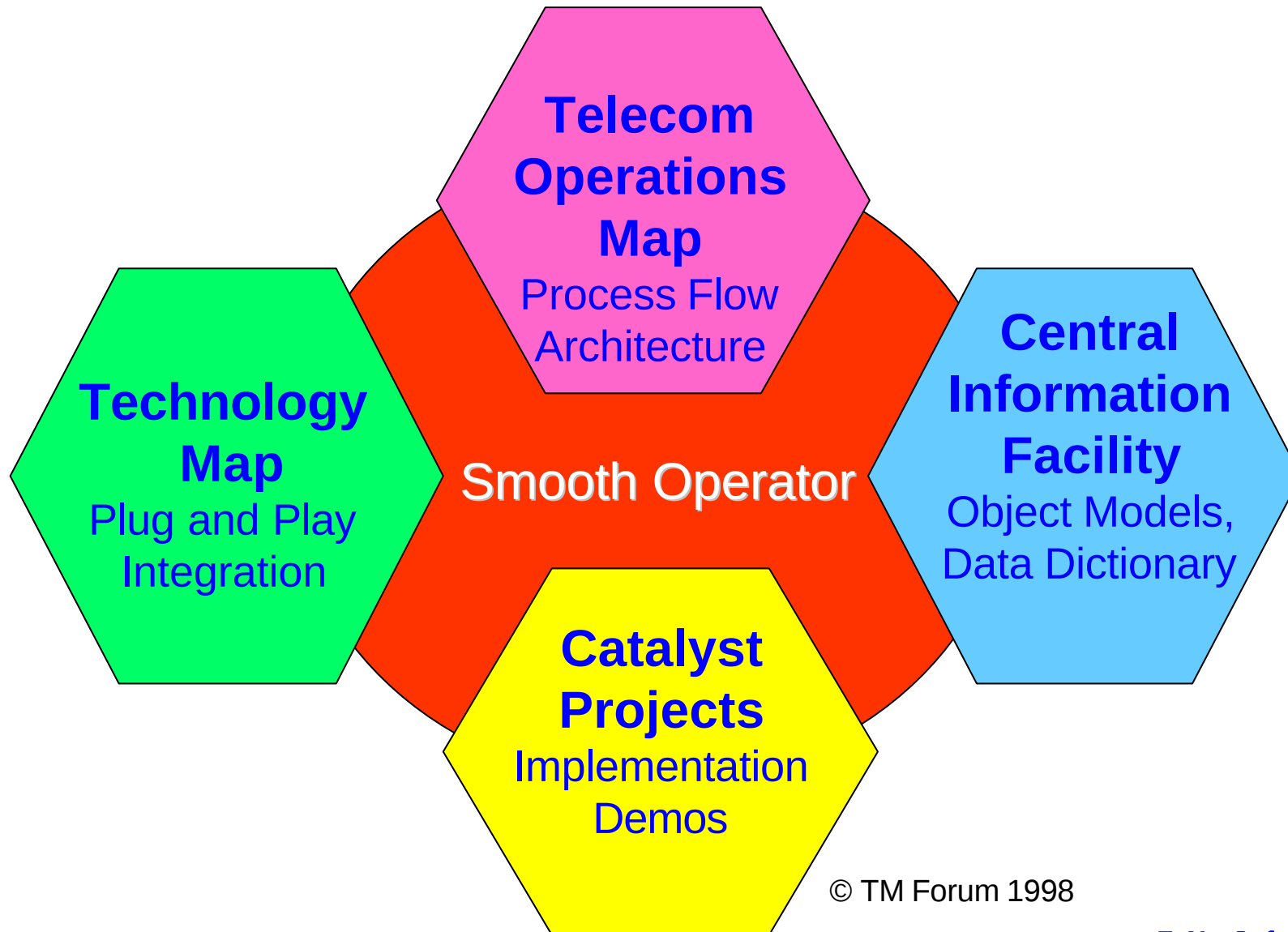


-  Easy Maintain
-  Simplified Operation
-  Unified (Standardization) OA&M



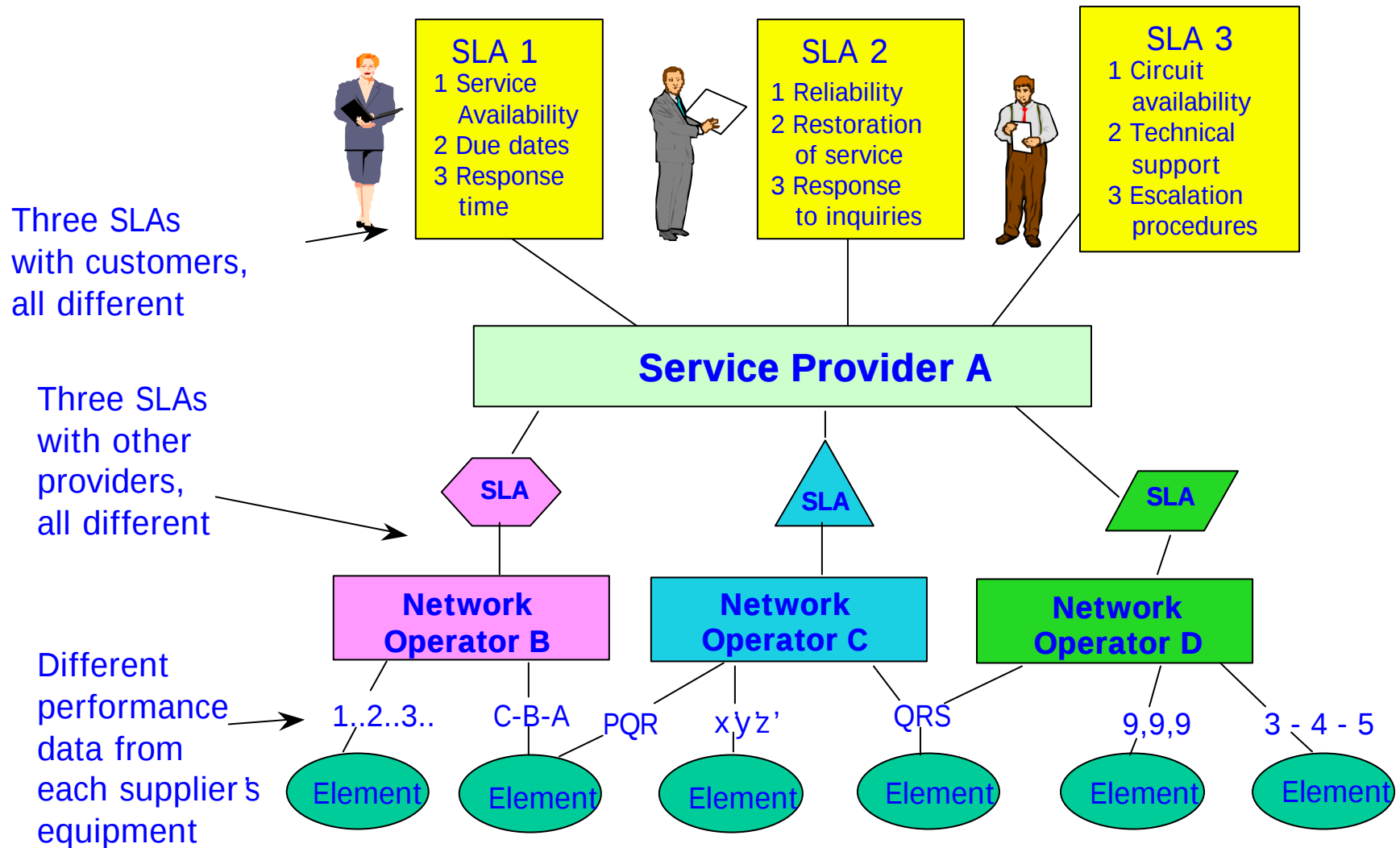


- What TM Forum provides



© TM Forum 1998

SLAs and the Value Chain



What is eTOM?

 **A business process model for framework that provides the enterprise processes required for a service provider**

 **eTOM**

 **TOM**

 Expands the scope to all enterprise processes

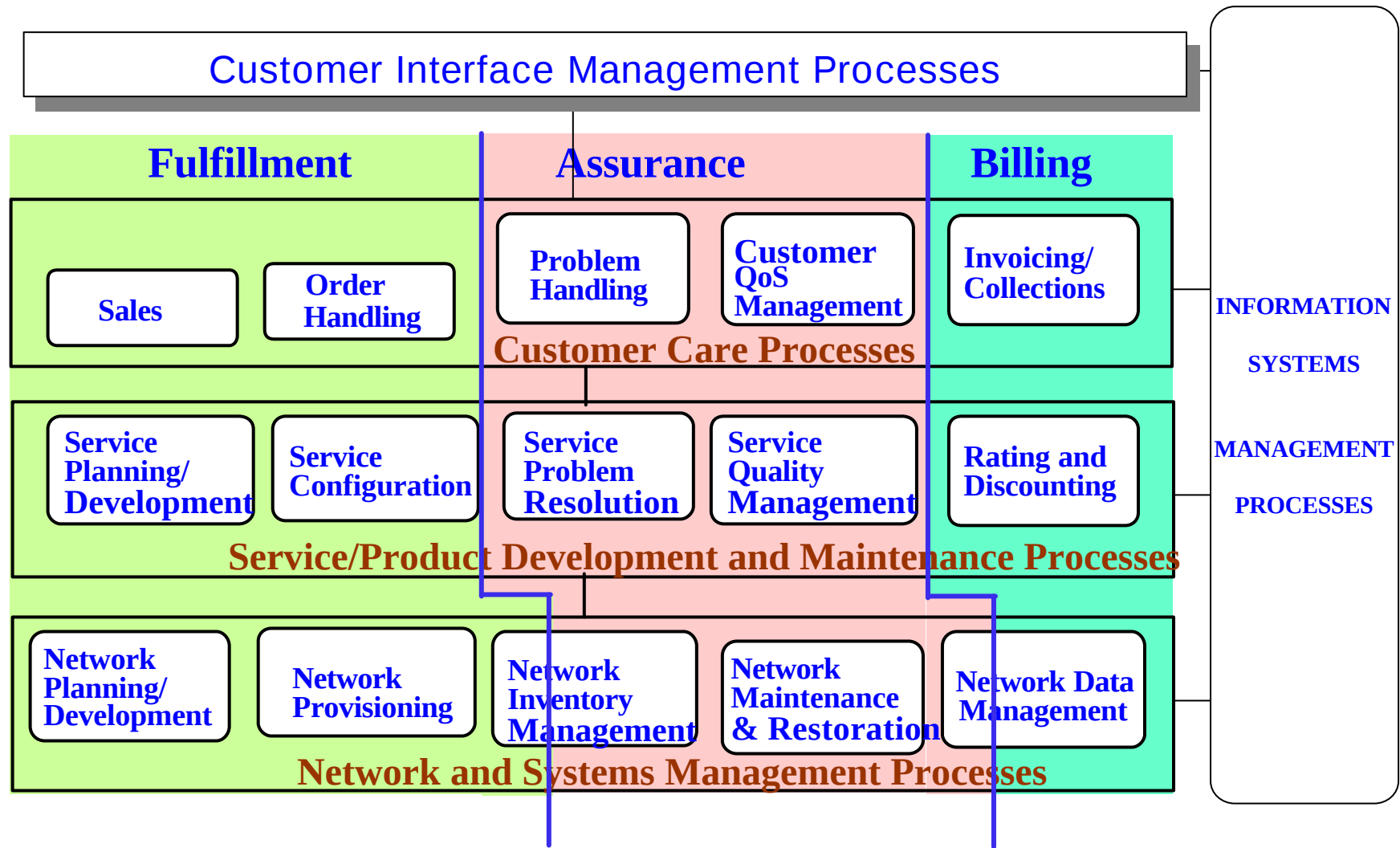
 Distinctly identifies Marketing processes

 Recognize three enterprise processes(Product, Infrastructure, Supply Chain)

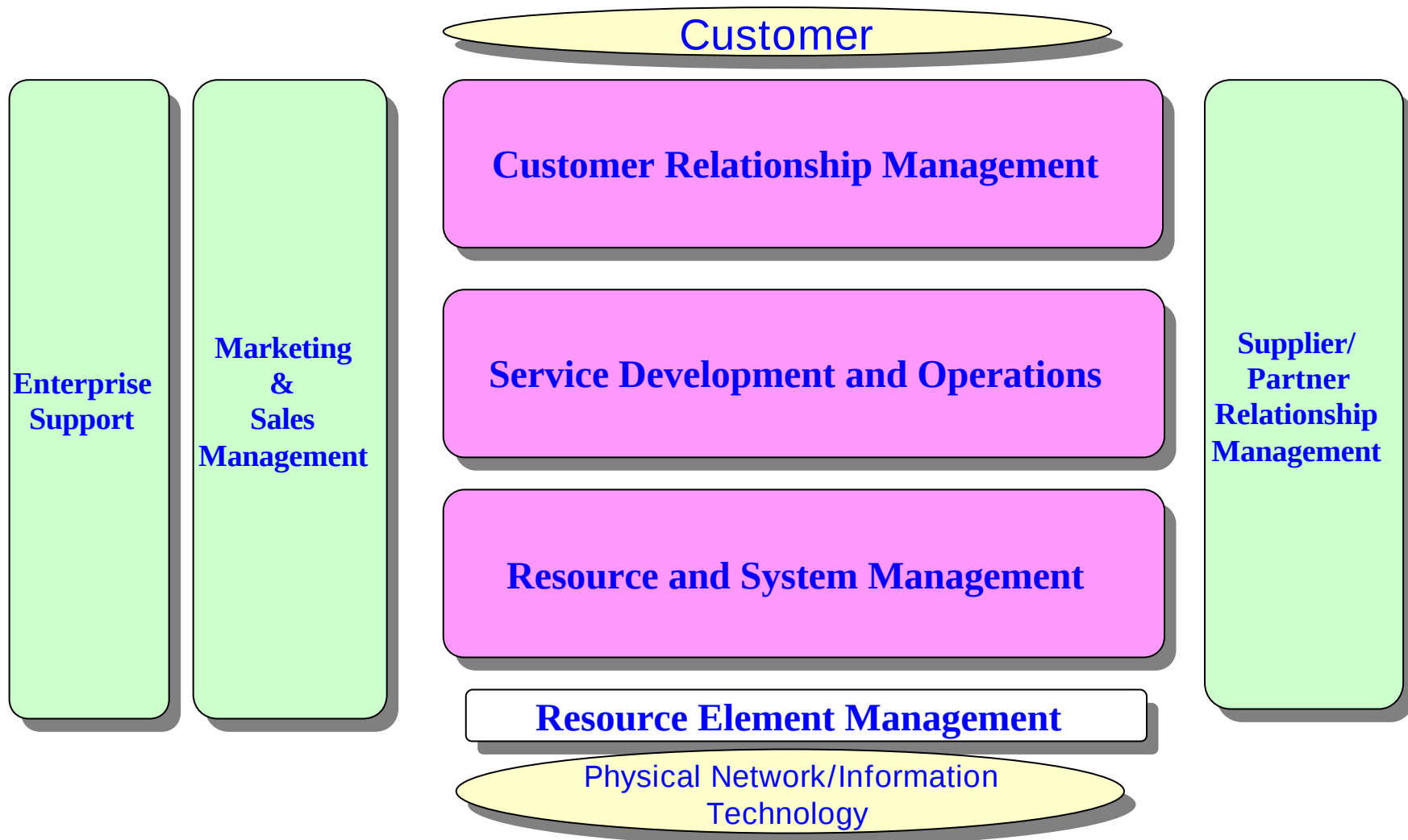
Why Change to eTOM?

-  **Broaden the current framework to a total enterprise framework**
-  **Reflect e-business impact on processes**
-  **Reflect the increased complexity in service provider business relationships**
-  **Better highlight customer control and self-management**
-  **Begin to recognize in processes the convergence of information and communications services and technologies**
-  **Reflect marketing, product management and customer retention management**

The TOM Framework



The eTOM Framework



Key eTOM Concepts

-  **Focus is on Customer and processes directly supporting the Customer,i.e.,**
 -  Fulfillment, Assurance & Billing
-  **Integrate Enterprise Processes with those of Partners/ Suppliers**
-  **Introduce Lifecycle Management business processes decoupled from core operations processes, i.e.,**
 -  Infrastructure, Product and Supply Chain
-  **Processes modeled generically to support all Products, Services and Channels for:**
 -  Product, Service, Channel, Technology Independent
-  **Process flows and Decompositions are designed to link to NGOSS systems programs**

Key eTOM Concepts

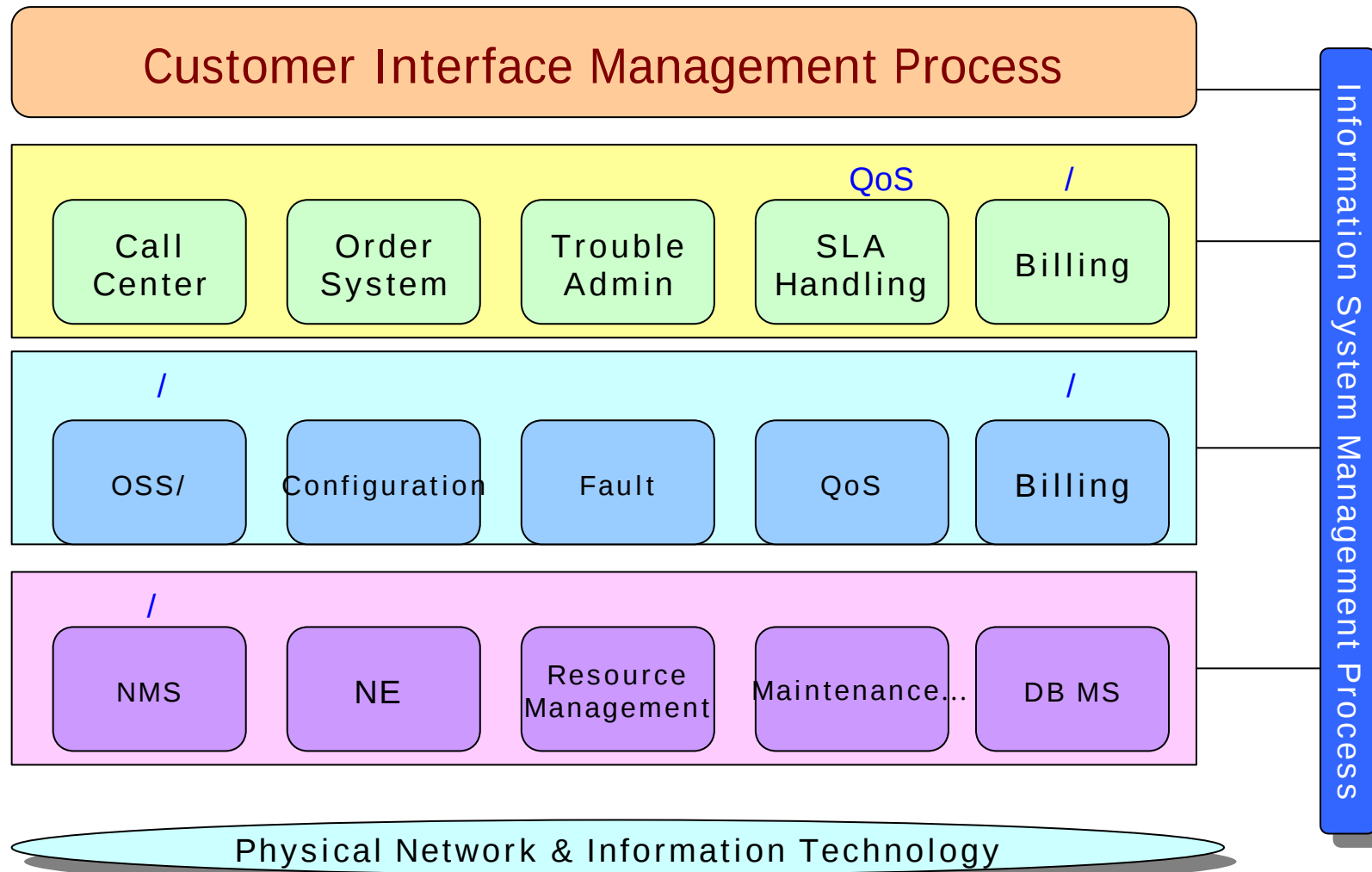
eTOM Framework uses hierarchical decomposition process modeling:

-  Processes decomposed to level of detail for process flow
-  Processes are decomposed functionally at appropriate level
-  Framework organized in Horizontal, Functional business process groupings.
-  Framework organizes both Customer Operations Processes and Lifecycle Management processes each into three Vertical, End- to-End process groupings.
-  Scope defined for each Process Element.
-  Process element and flow threads can be reused

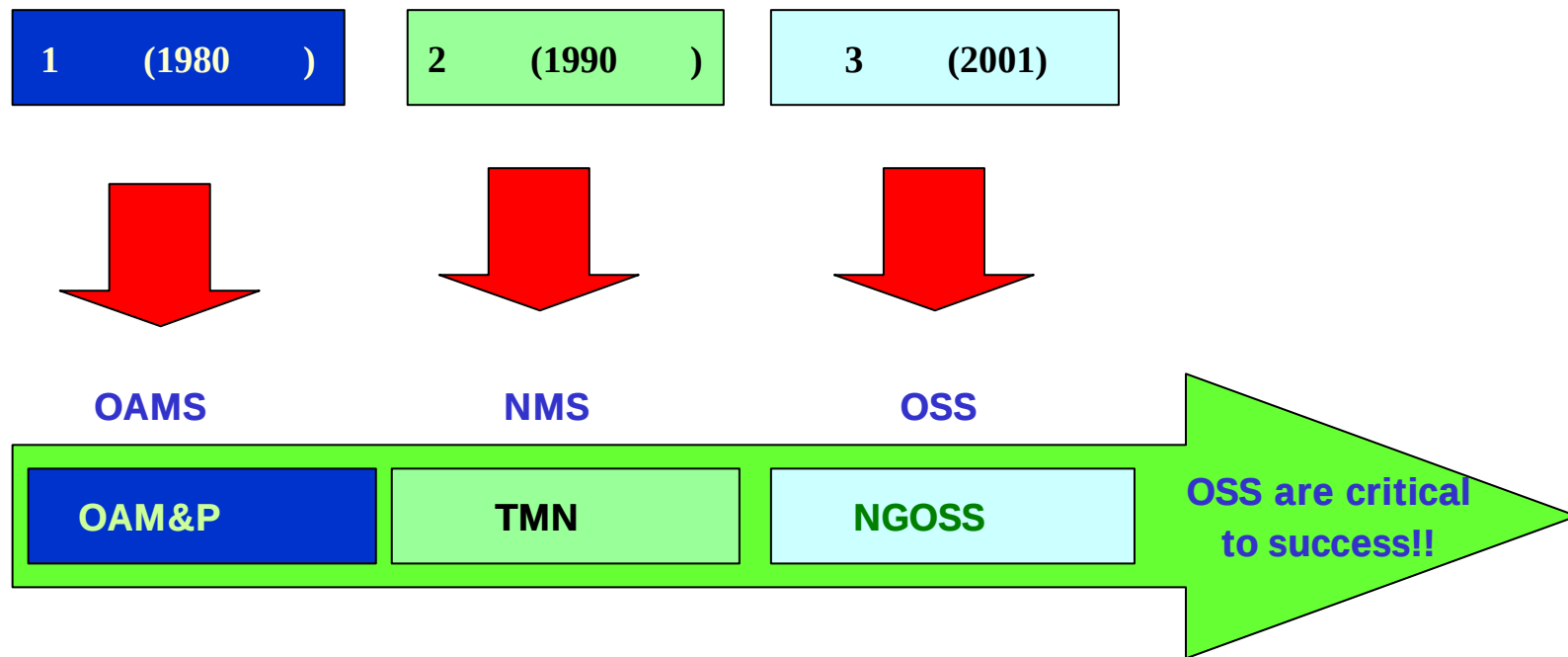
All Process Elements of Enterprise are included

Process Elements can support more than one Vertical, End- to- End Process Grouping for delivery consistency

OSS



Operations & Management Systems Evolution



~~ASCII protocol~~
~~Often vendor specific~~

~~OSI CMIP~~
~~The only Show in town~~

~~Java~~
~~OMG CORBA~~
~~Microsoft DCOM~~
~~Web~~
~~Operating System support~~

OSS

 AT&T – 4 OSS

 BT – OSS

 Telia() – 800 OSS

 Telecom Italia() – , ,

 Telstra() – IP OSS

 OSS flow - through 가 가

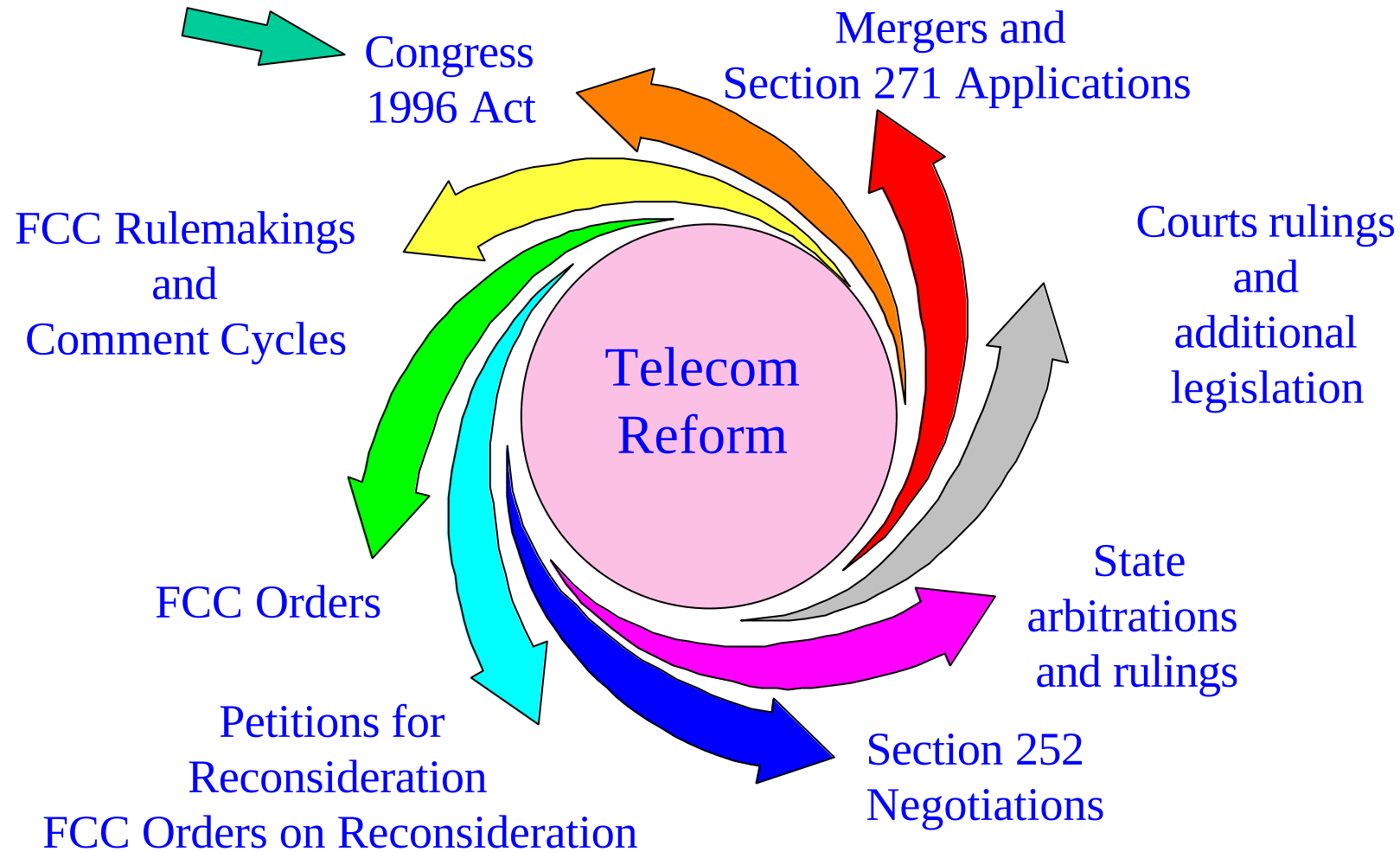


OSS

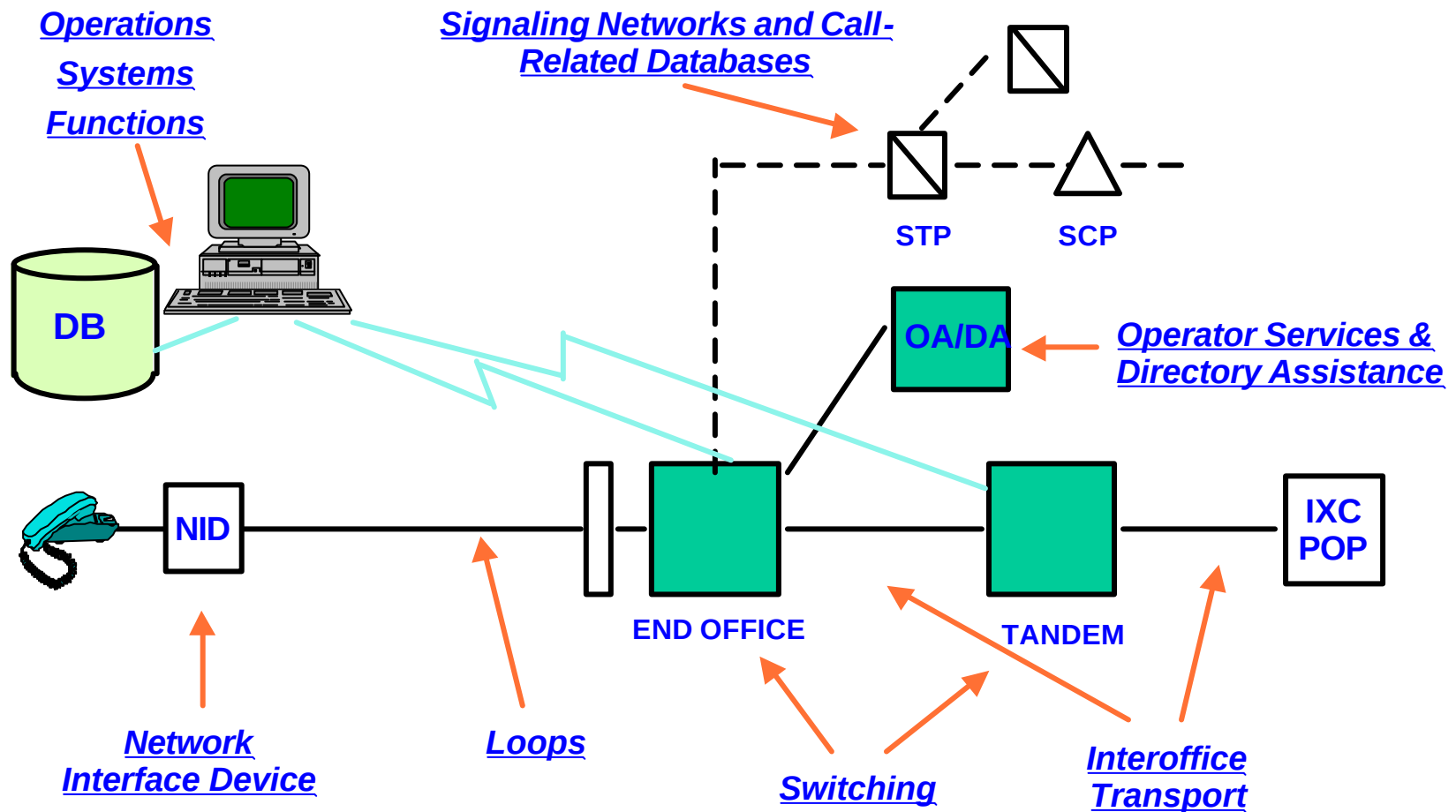


OSS

U.S. Telecom Act



The FCC Requires The ILECs To Unbundle Their Network At Multiple Points



A Case in Point: The Telecom Act of 1996

Its Intended Impact

-  **Eliminate network barriers to competition**
 -  Statutory, regulatory and technical
-  **Stimulate rapid service deployment using new technologies**
-  **Remove barriers to open telecommunications competition**
 -  Federal, state and local laws, rules, and policies
-  **Potential economic and legal benefits**

Telecommunications Reform Act of 1996:

Its Impact on OSS Interconnection

 **Interconnection of service provider networks and OSSs for information exchange**

 **Providing non-discriminatory / common access to OSSs**

 pre-ordering

 ordering

 provisioning

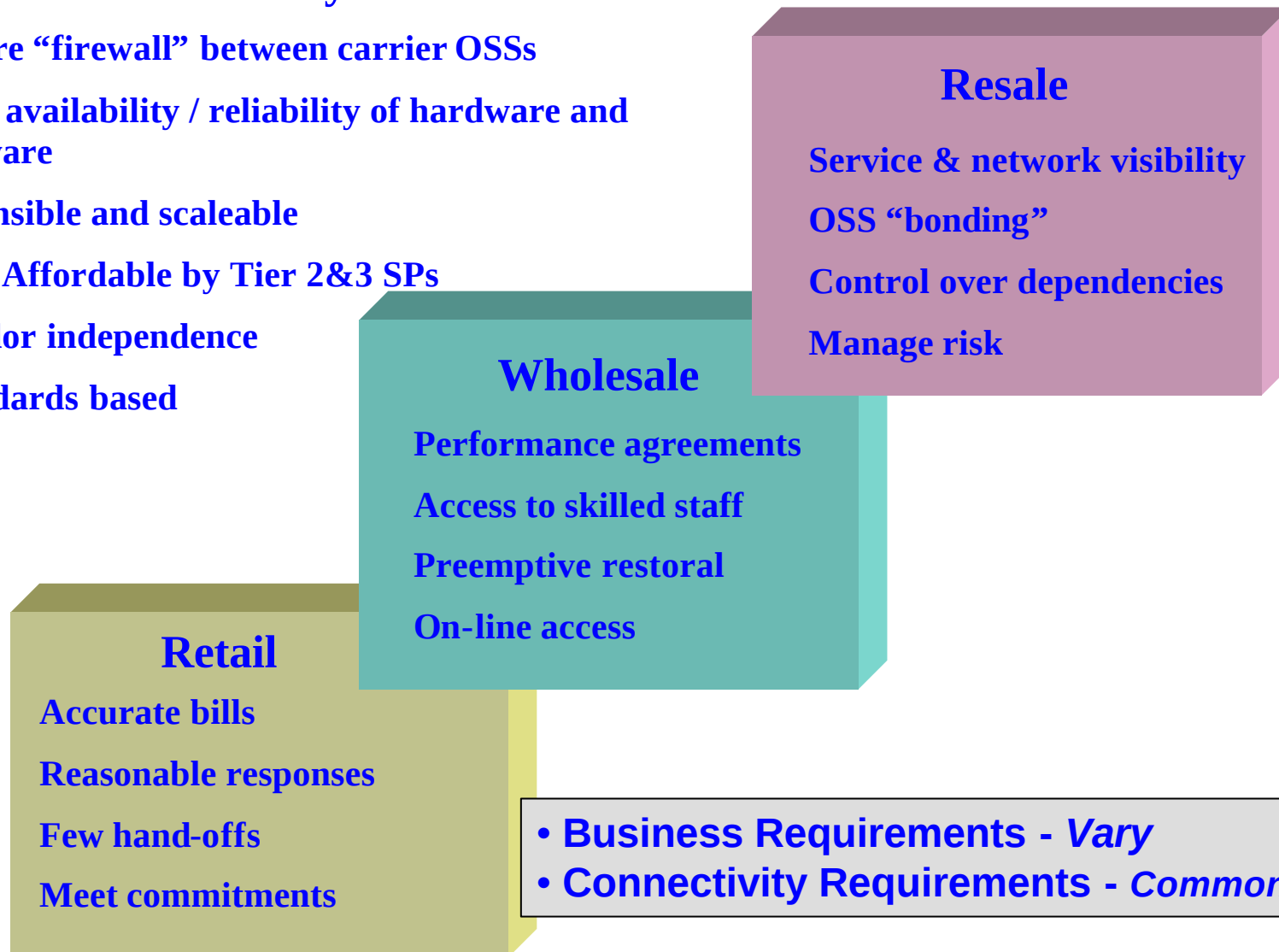
 maintenance & repair

 billing

OSS Interconnection Requirements

Inter-carrier connectivity

-  Secure “firewall” between carrier OSSs
-  High availability / reliability of hardware and software
-  Extensible and scaleable
 - Affordable by Tier 2&3 SPs
-  Vendor independence
-  Standards based



Example: initial evaluation of OSS impacts for Service Delivery

Operations Support Systems

<i>Activities</i>	Customer & Service Provider Care	Service Deliver	Service Assurance	Charging & Billing	Data Layer	Work Force Mgt	Network Mgt
Client Relationship	***	y *		*			
Customer Profile Management		*					*
User Acquisition Management	***	*					
Resource Availability Check		**			*		*
Numbering Schema Management		*			*		
Work Force Management		*	*			**	
Service Activation/ De-activation		**				*	*

*** Major Impact

** Medium Impact

* Minor Impact

OSS Interconnection:

Tomorrow's requirements - One size fits all?

 **Traditional Electronic Bonding?**

 OSI / CMIP

 **EDI?**

 Electronic Data Interchange

 **EC - LITE?**

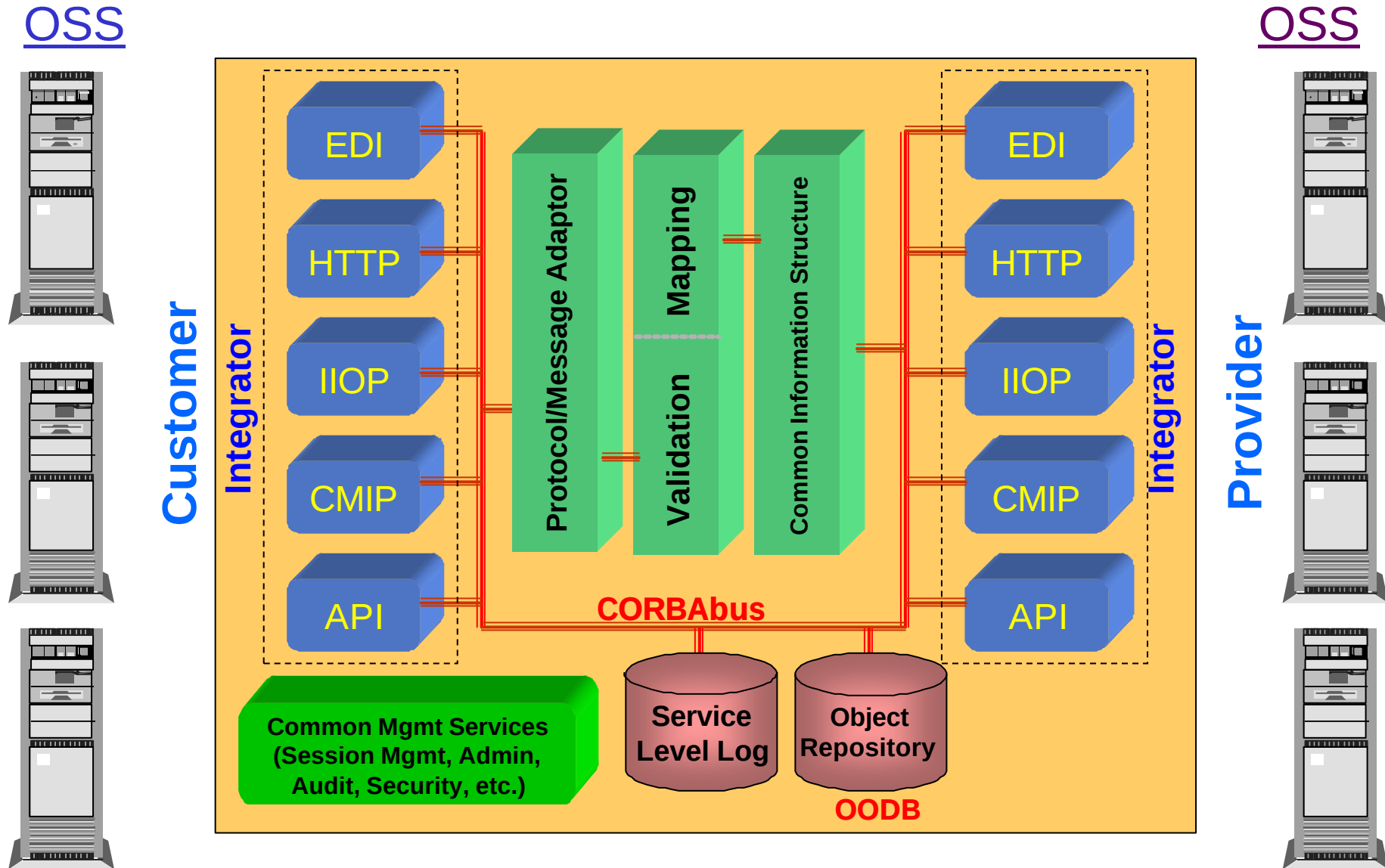
 Electronic Commerce - Lite

 **HTML/HTTP**

 **CORBA/IDL**

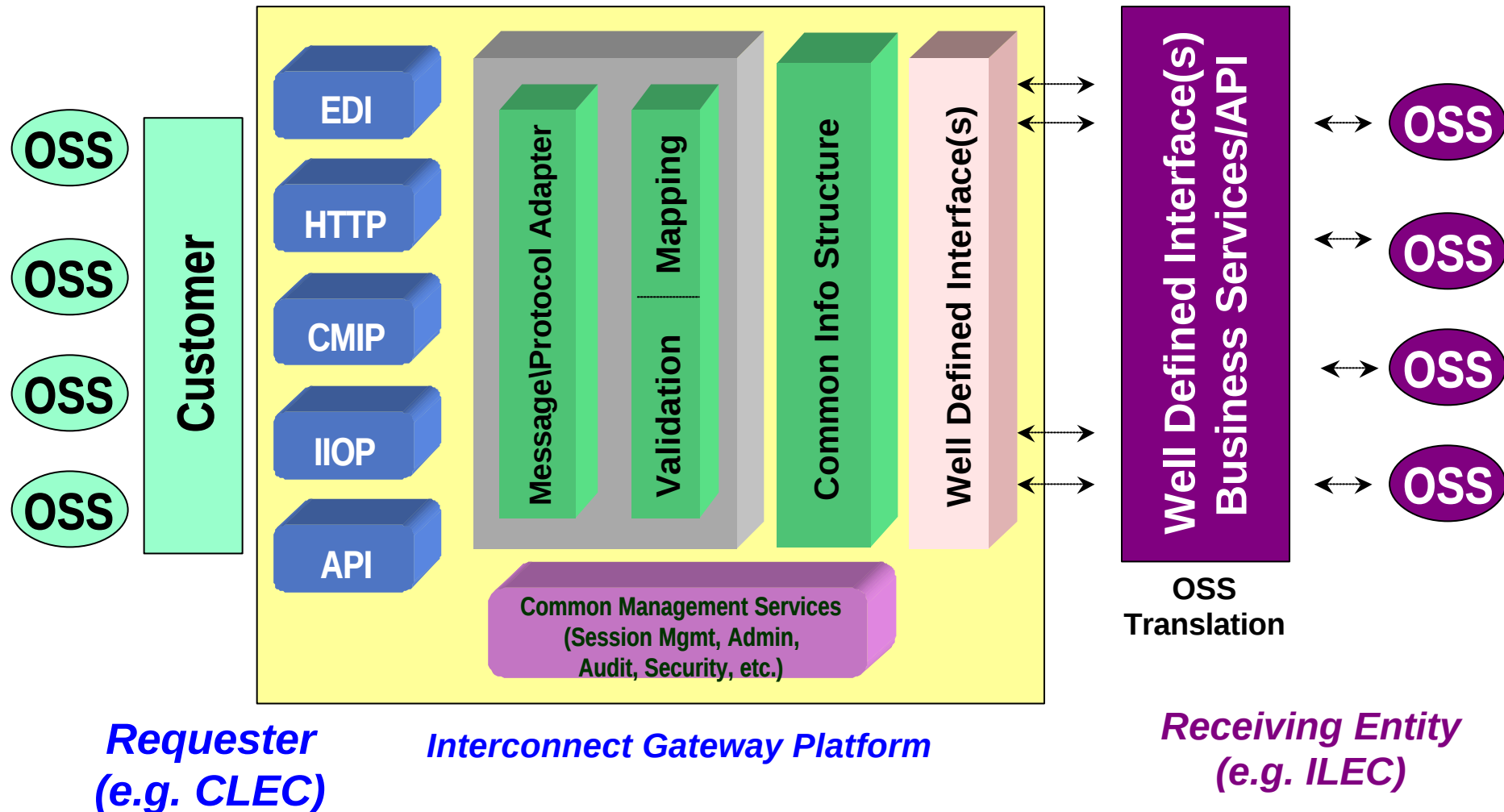
 **JAVA/XML**

OSS Interconnection Example: *A Potential Solution*



OSS Interconnection: Application Architecture

A Common Interconnect Gateway Platform



Introduction to Electronic Bonding

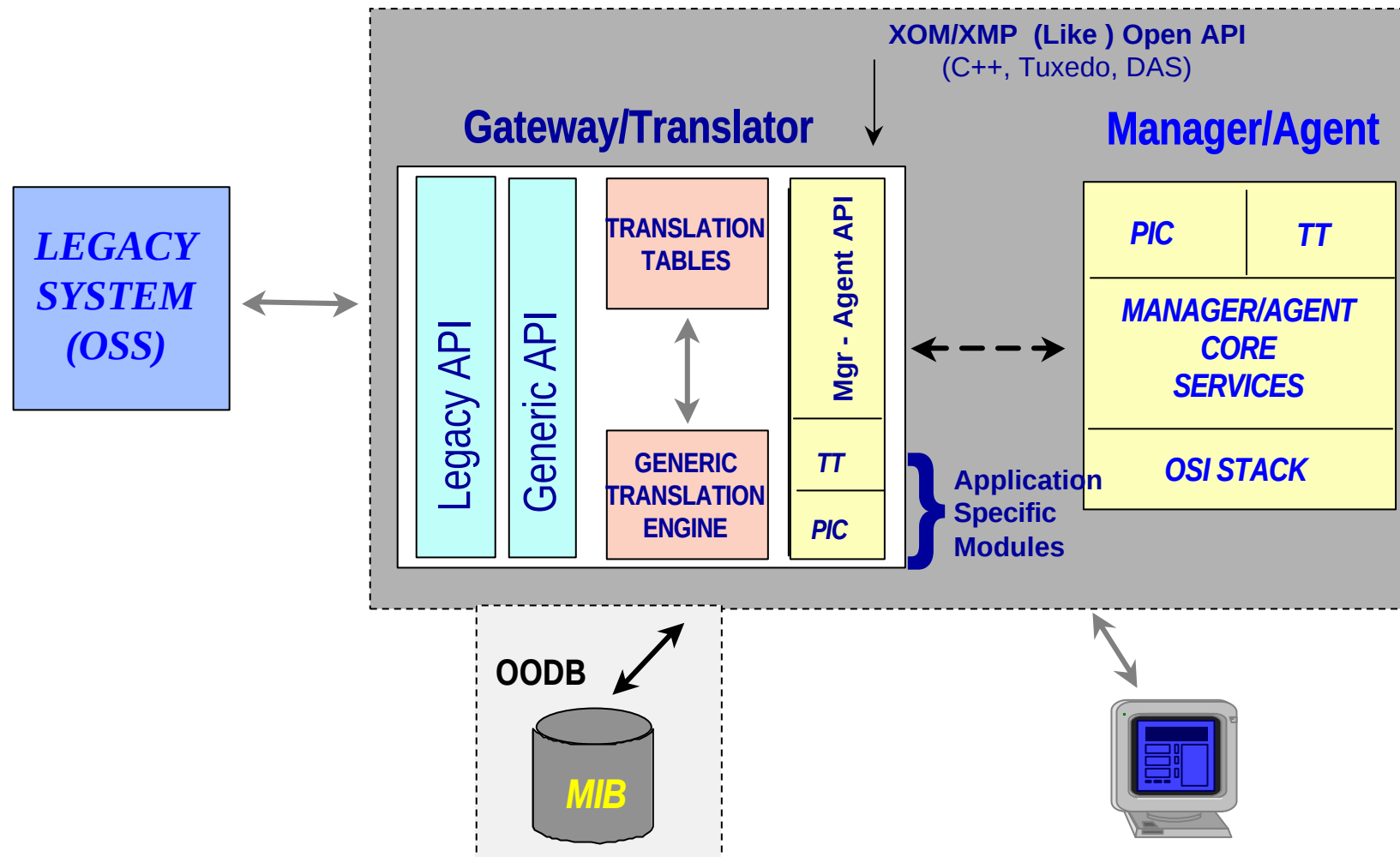
- ✍ Electronic Bonding for Trouble Administration was the industry solution using ANSI Standard T1.227/228
- ✍ It is the recommendation from Electronic Communication Implementation Committee (ECIC) TA Sub-Committee
- ✍ It allows applications to communicate between each other while consistently maintaining data integrity
- ✍ It supports for “Local Resale” and “Local Number Portability” in USA
- ✍ The logical solution is to have gateways in-place that allow access, to the interface, in any protocols (e.g. CMIP, JAVA, CORBA, EDI,etc.)

Introduction to Electronic Bonding (cont)

- ✍ EB application provides an INTERFACE to the Inter Exchange Carriers (IECs) gateway to support an application-to-application Trouble Administration system for Local Exchange Carriers (LECs)
- ✍ It accept messages from ICs according to industry standards and manages trouble administration functions
- ✍ It includes entry of trouble report, updates to trouble reports, and the return of electronic responses to IECs

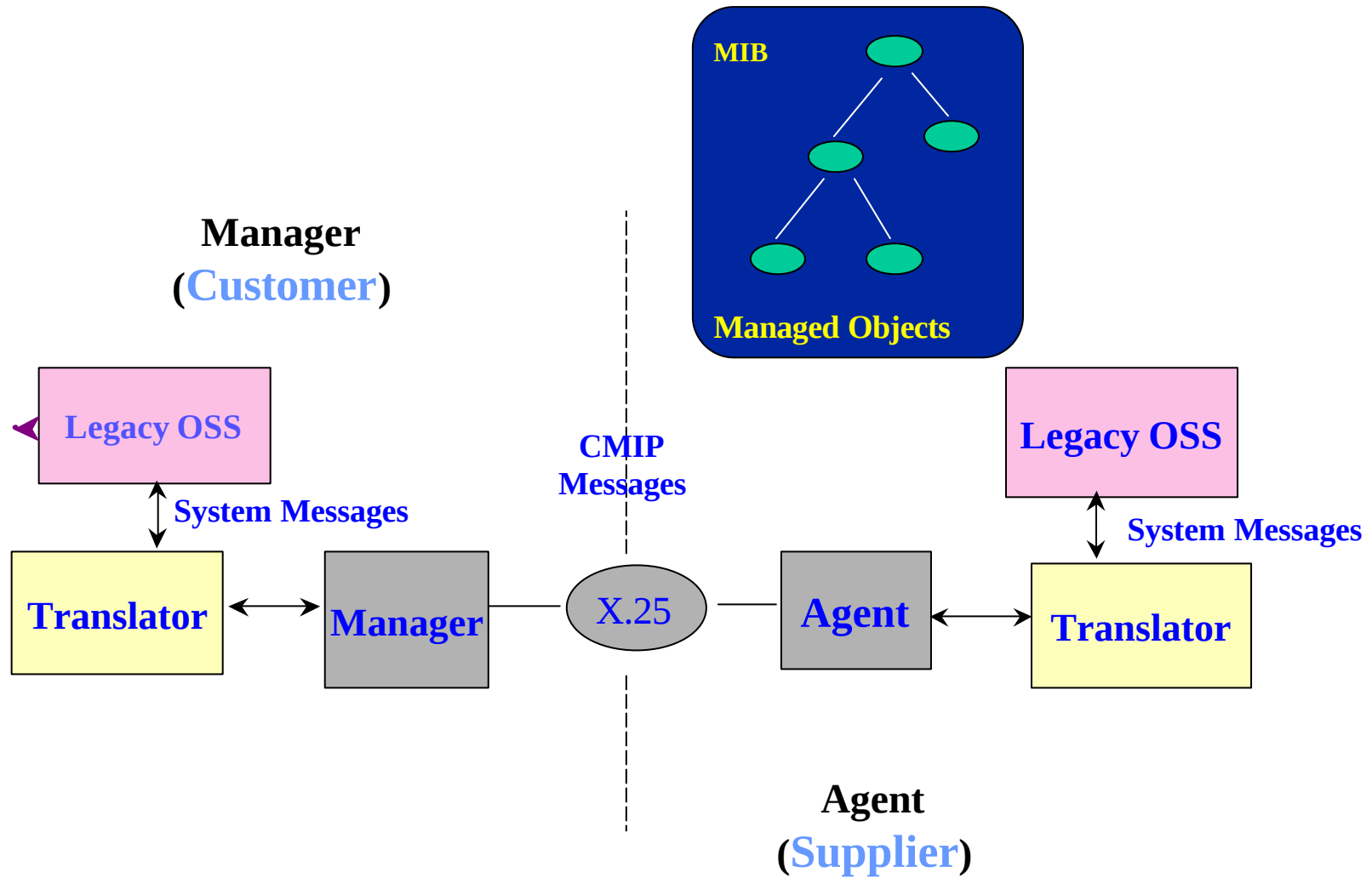
OSS Interconnection:

Electronic Bonding - An object oriented paradigm

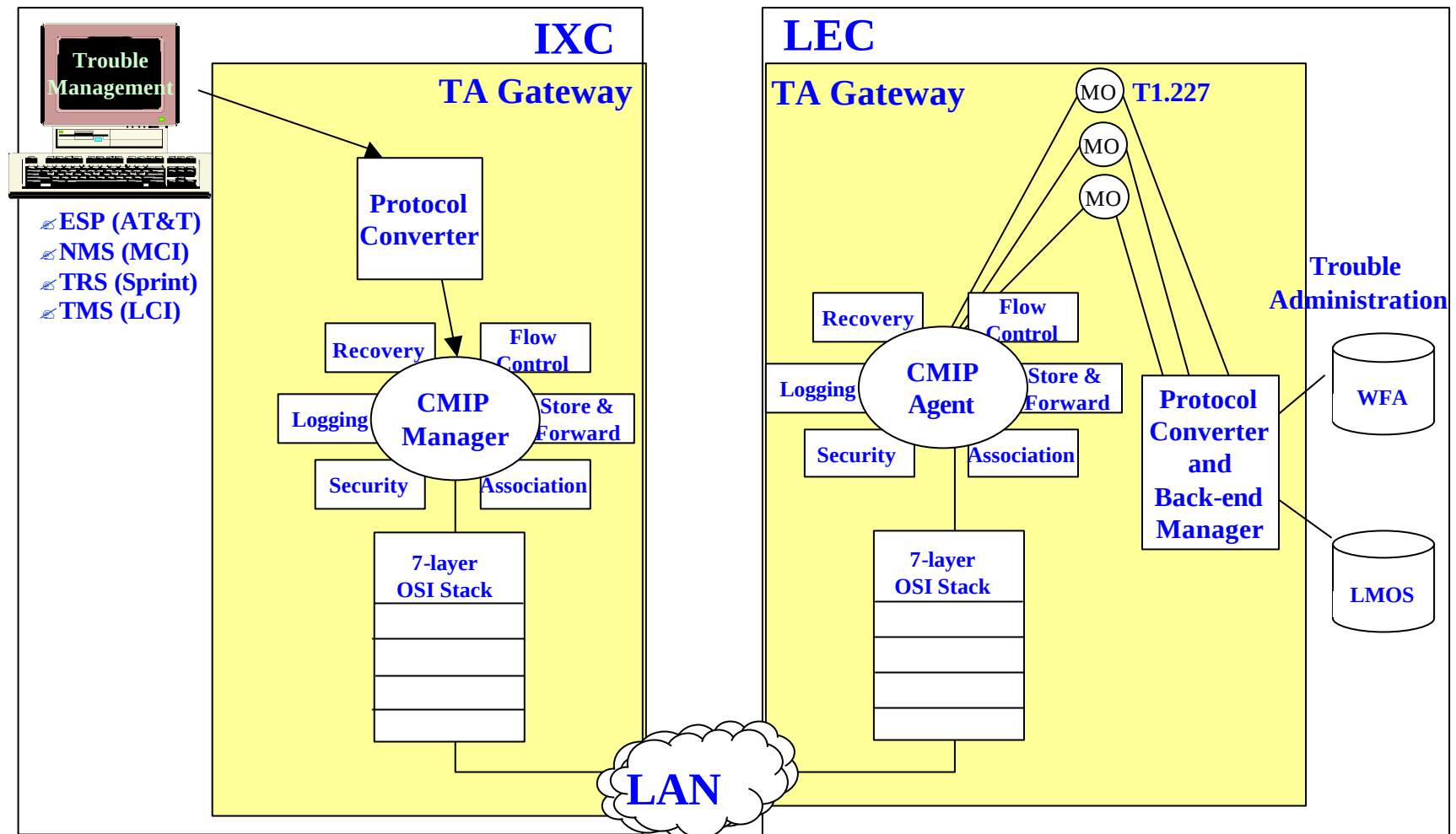


OSS Interconnection:

EB Implementation example



Electronic Bonding for Trouble Administration



OSS Interconnection:

Concept Validation Pilot (CVP) Functionality

NMF CIGP PILOT FUNCTIONALITY				
Functional Area	Functions Supported	CMIP	EDI	HTTP
Pre-Ordering	Select/Reserve TN	T1.256	TCIF Rel 8	GTE proposal
	Address Validation		TCIF Rel 8	GTE proposal
Ordering	LSR & sup processing		TCIF Rel 8	
	Service Activation Report		TCIF Rel 8	
TA	Creates	T1.227/228		
	Event Reports	T1.227/228		
Billing	History (report on multiple accounts, no complex services)		TCIF EDI issue 7 chapter 7.3	
PIC	Create	T1.246		new
	Event Report	T1.246		new
	FYI	T1.246		new

OSS Interconnection:

Communication Protocols For the CVP

Standard

- CMIP / OSI / EB
- EDI over SSL3 (file transfer protocols - VAN supported)
 - batch and interactive
- HTTP / Web

Non - Standard *(out of scope on customer facing side - gateway entry point)*

- industry - IBM MQ Series, Java / RMI, Tuxedo
- internal / proprietary

Integration of existing deployments (e.g. OSI/CMIP)

-  goal to reduce peer-wise agreements

Minimal tested functionality and initial support with future extensibility in Phase 2

The choice is ours...

Interconnection through JIA?

-  **J**oint **I**mplementation **A**greements
-  Feasible in alliance
-  Adding new partners cumbersome

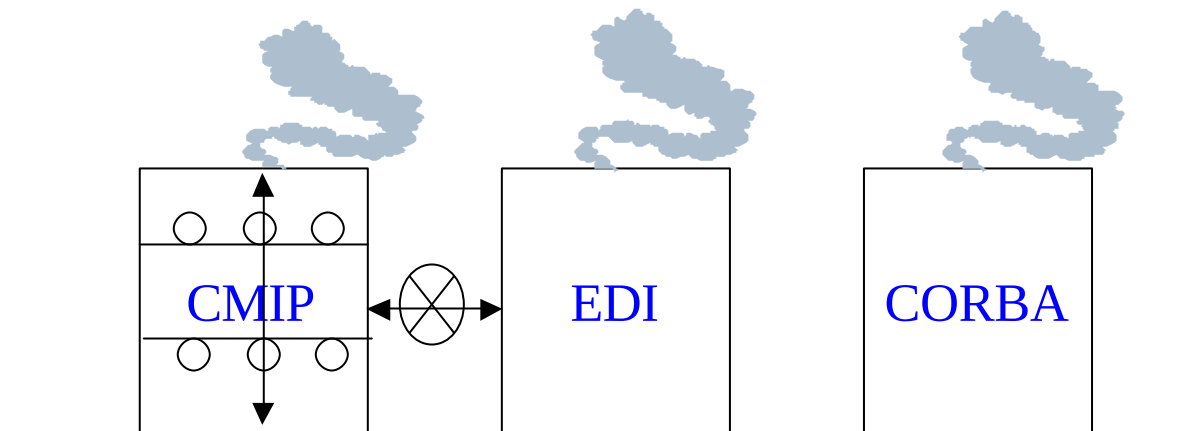
Interconnection using CIGP?

-  **C**ommon **I**nterconnect **G**ateway **P**latform
-  Fits our Infrastructure Centered IT Strategy
-  Off-the-Shelf products
-  Cost-Efficient
-  Clear requirements on new partners



Today's OSS Landscape

- ✍ **An array of protocol interfaces**
- ✍ **Support CMIP and EDI, CORBA, HTTP**
Thus there is a need for multiple protocol interfaces
- ✍ **Too much learning time spent by the Carriers to technically interconnect OSSs**
- ✍ **Need to remove protocol specific stovepipes**

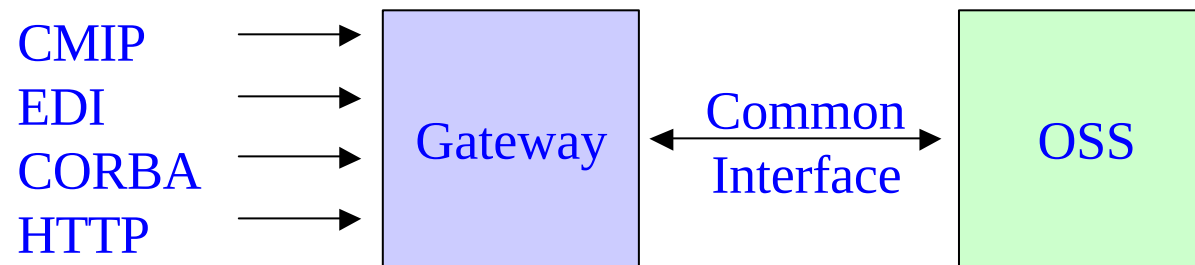


Advantage of Interface Standardization

 **Time to market efficiencies to be gained with:**

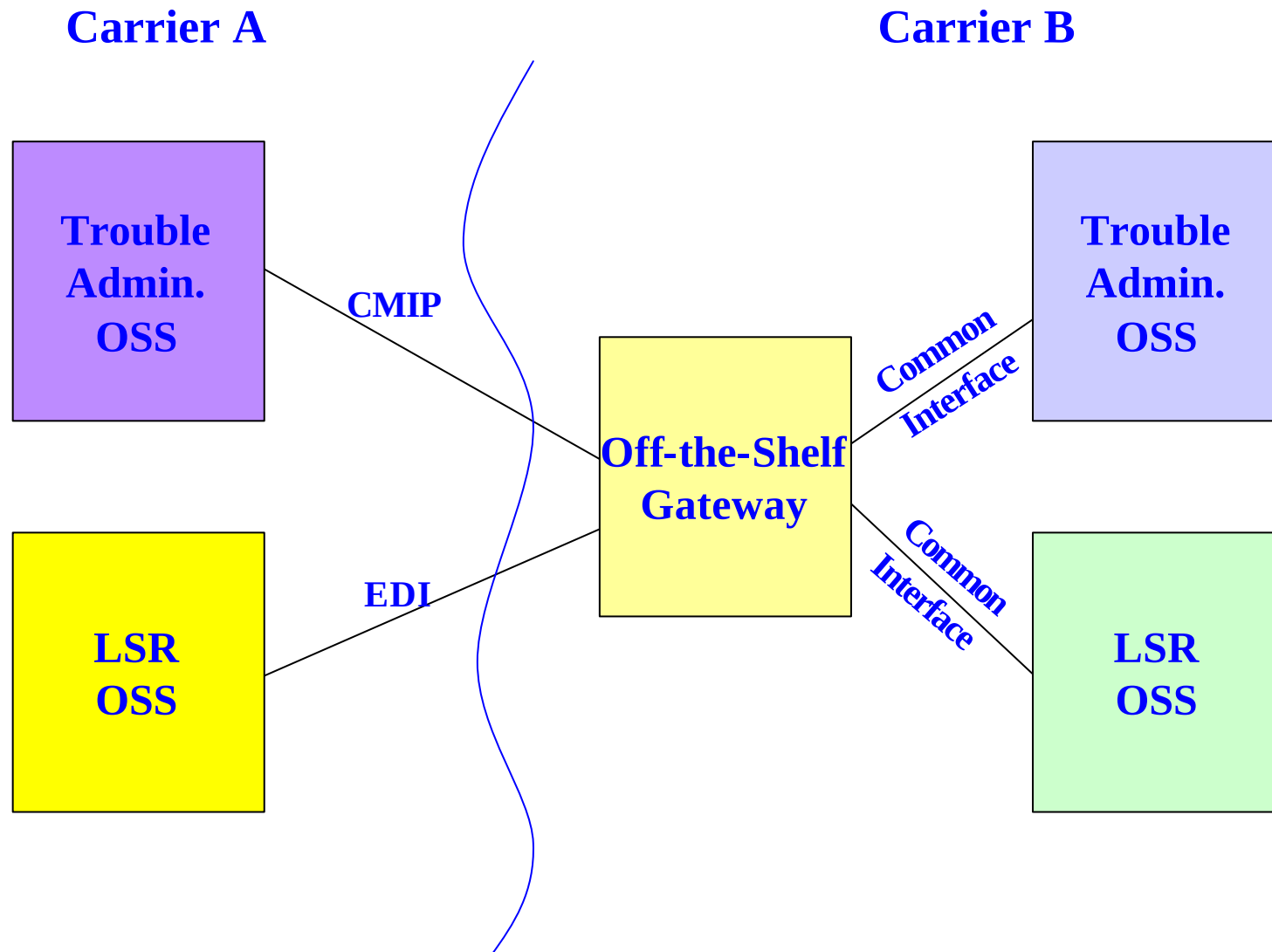
 A common OSS interface

 Off-the-shelf Gateways supporting multiple protocols

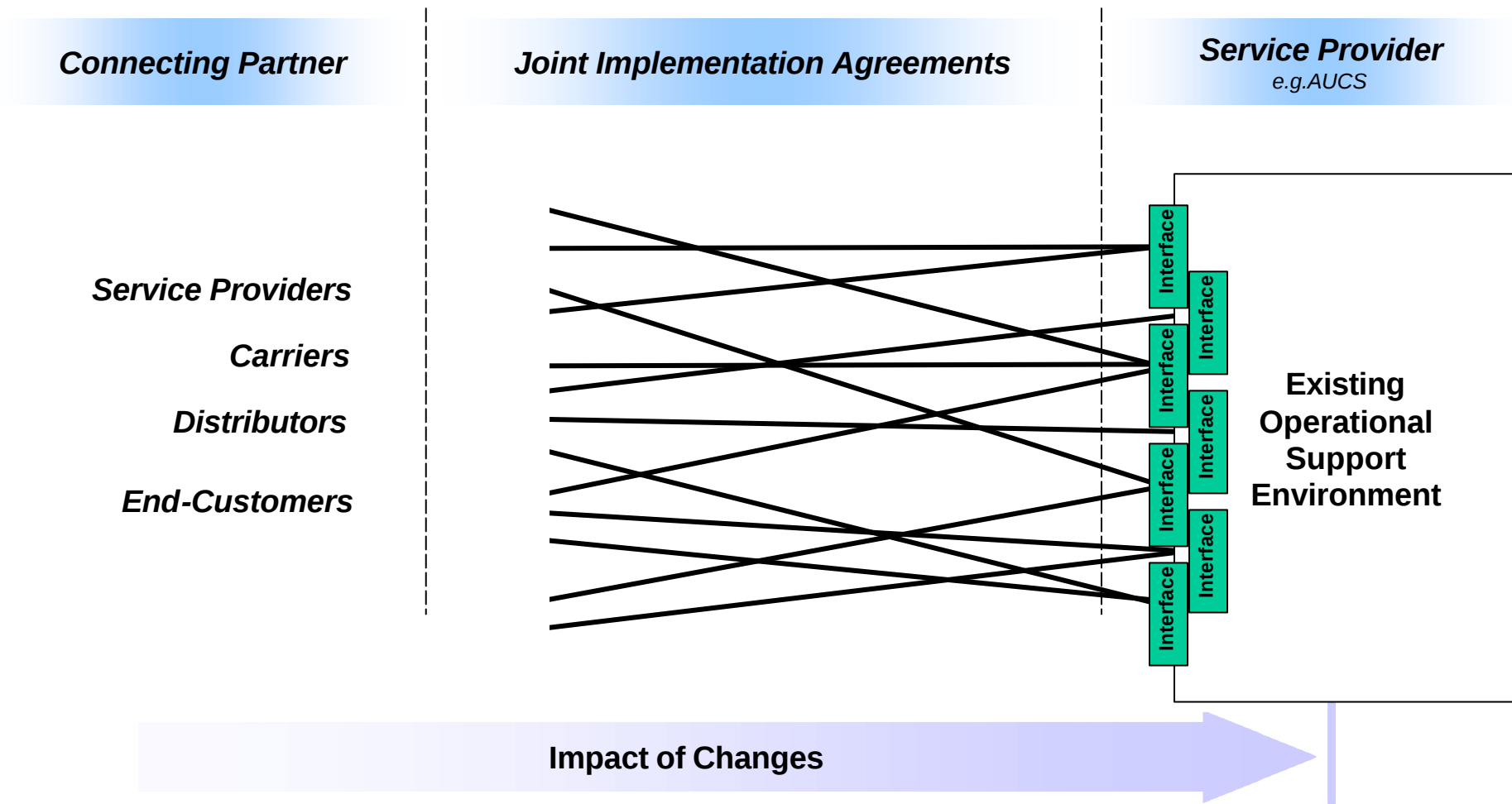


Gateway handles the variety of Carrier pairwise interface agreements

OSS Gateway Supporting Multiple Applications & Protocols



Interconnect Using JIA



Joint Implementation Agreements (JIAs)

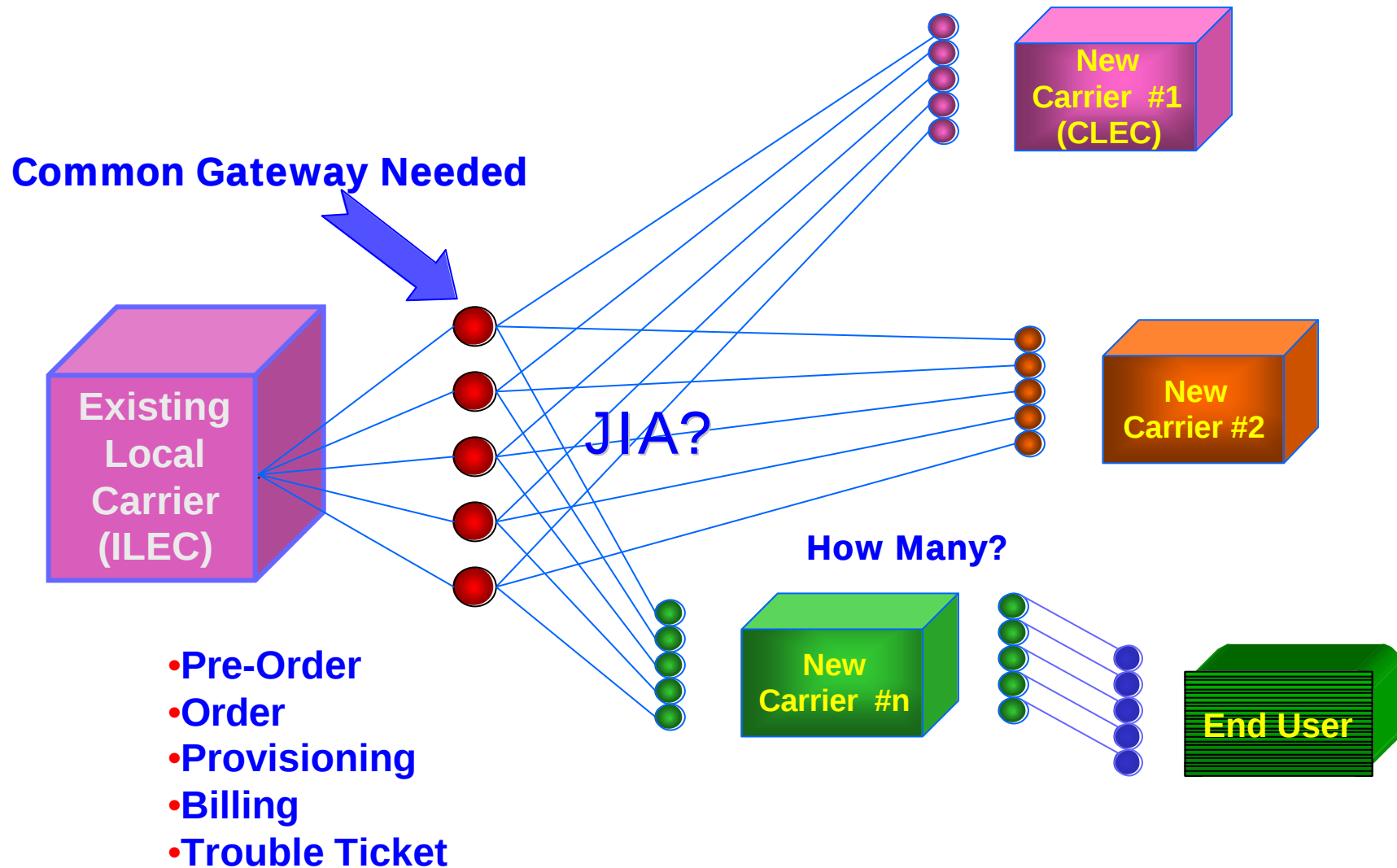
- ✍ Evolving ANSI standards associated with the creation of new attributes or extensibility to existing attributes are ongoing endeavors
- ✍ Additional components, such as trading partners dissimilar data requirements as defined in JIAs, intensifies the need for a modular or an encapsulated approach.
- ✍ A Well Defined Interface(WDI) between the gateway platforms and the business platform has been engineered to ensure performance requirements can be met

Joint Implementation Agreements

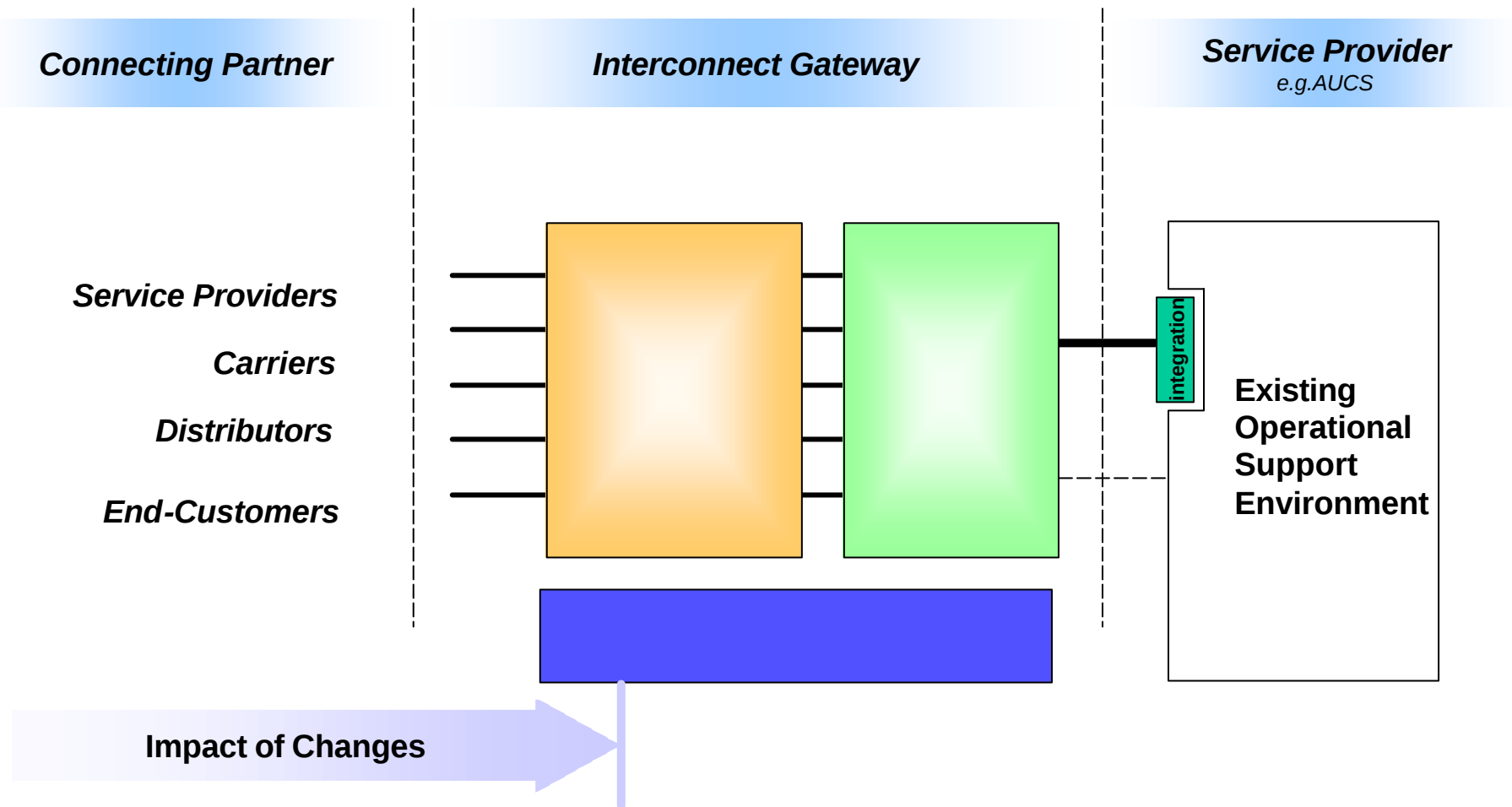
- ✍ Identify Security Requirements
- ✍ Develop Network Design
- ✍ Identify Recovery Requirements
- ✍ Identify Hardware, Software Requirements
- ✍ Data Mapping
- ✍ Identify Single Point of Contact for Failures
- ✍ Identify Maintenance Windows
- ✍ Identify Manual Processes
- ✍ Identify Measurements
- ✍ Identify Naming Conventions
- ✍ Negotiate JIA
- ✍ Output- JIA Document & Agreement

OSS Interconnection:

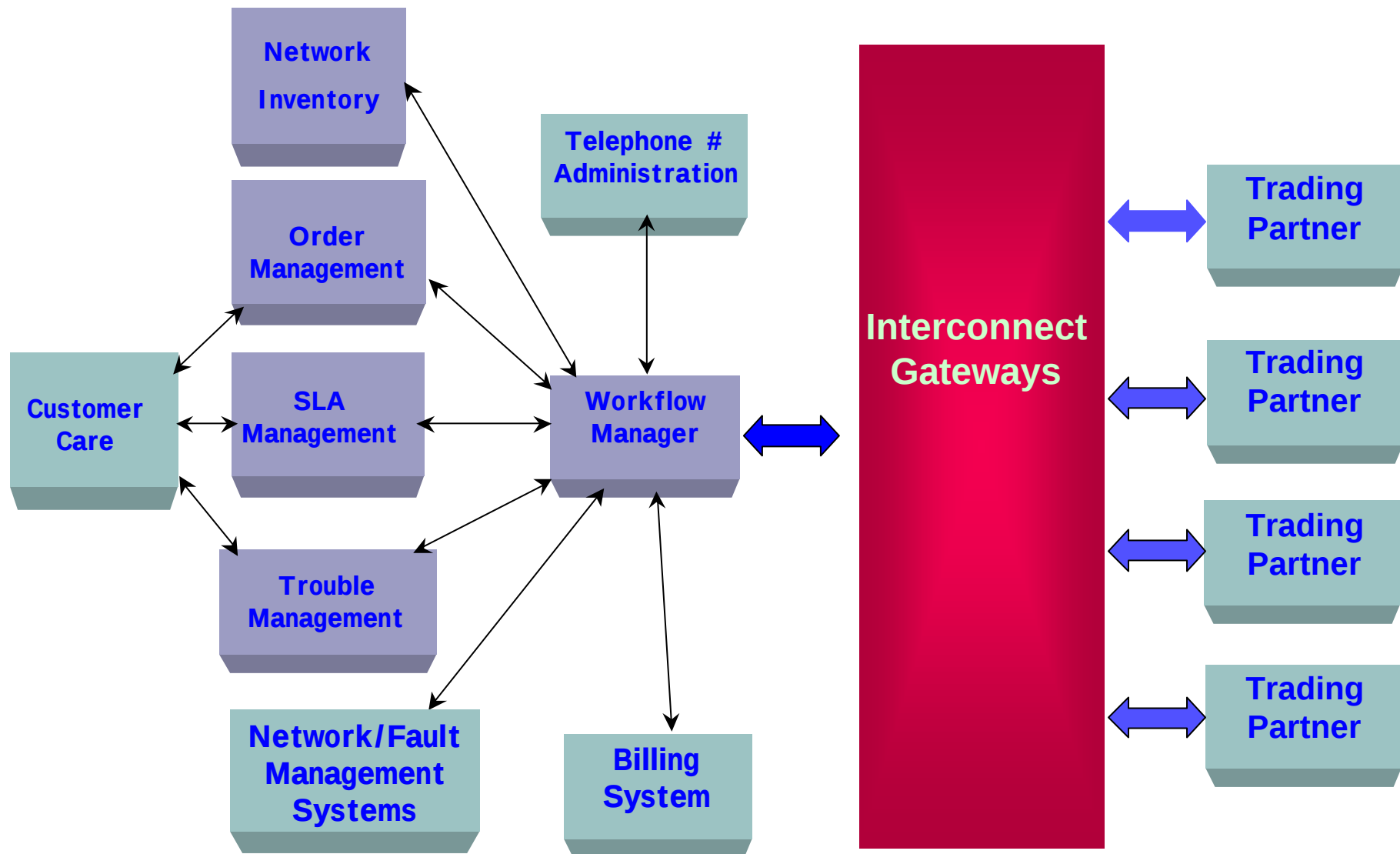
The Solution Users



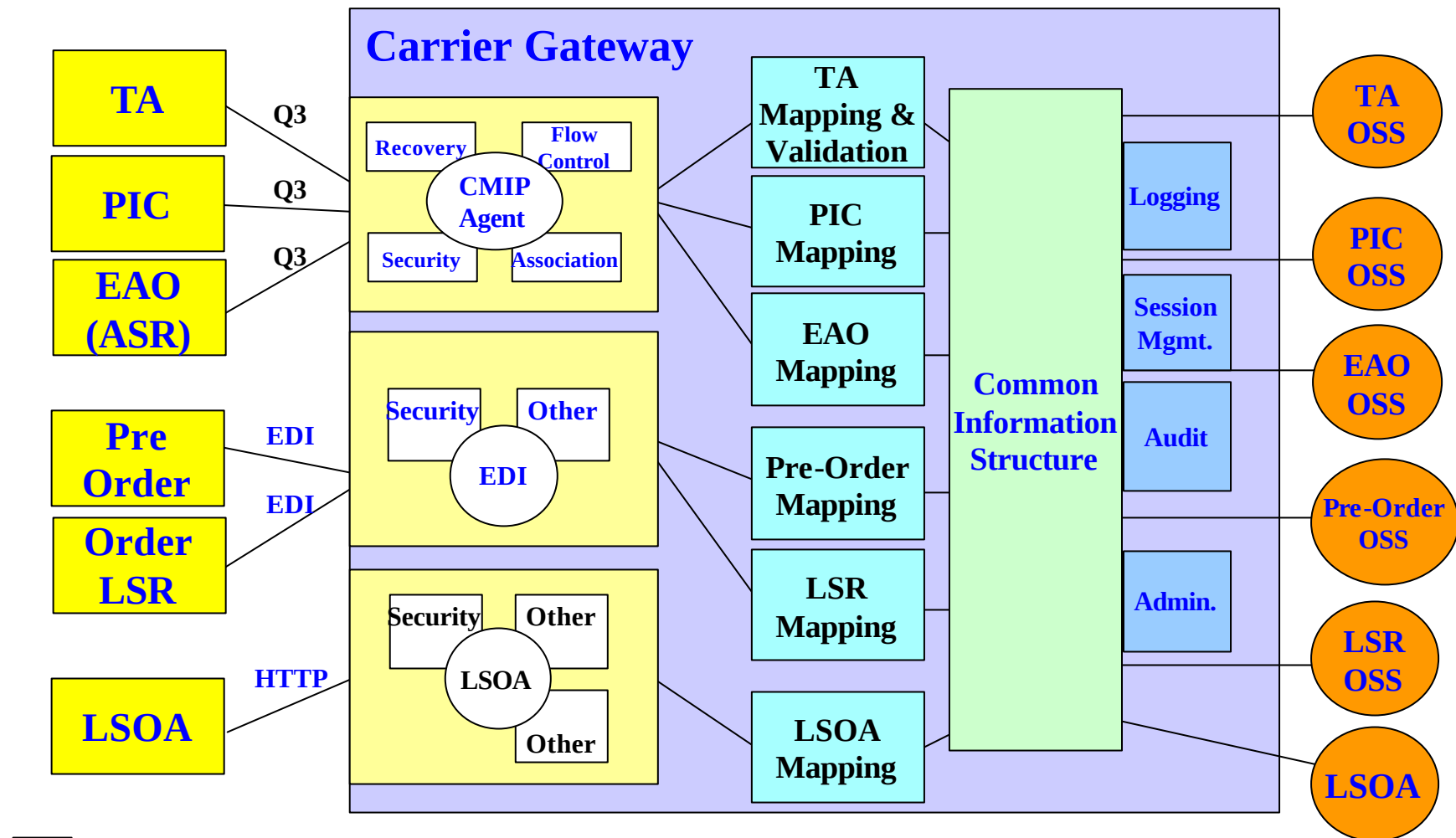
Interconnect Using Gateway



Where Gateways Fit

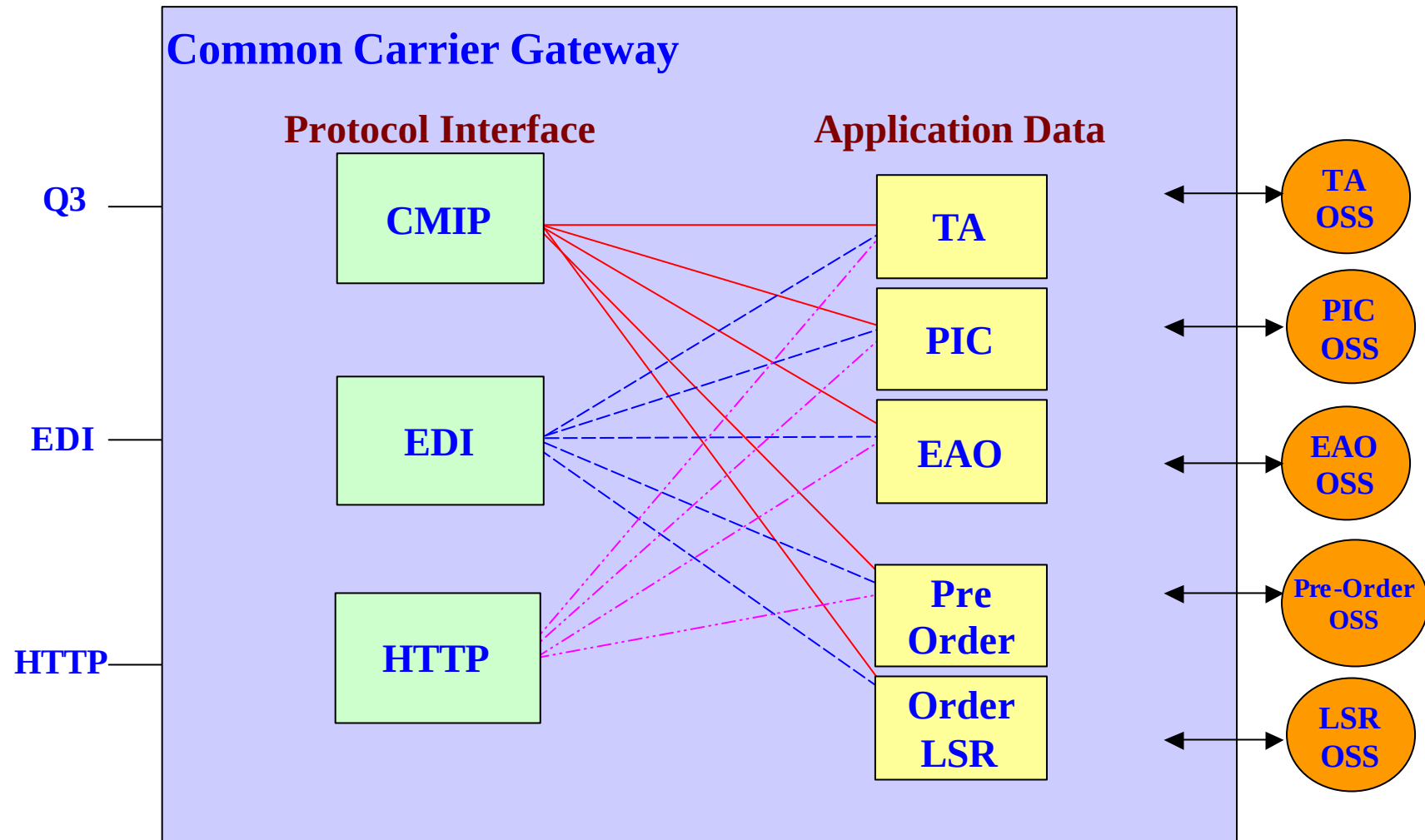


Common Carrier Gateways



 = Common Services

Separation of Protocol Interface from Application Specifics



...The Emerging Marketplace

Consumer

Residential

off the Rack
Subscribers...

High-Tech Consumer

Small Office/
Home Office...

Commercial

Mid-Sized
Business...

Networked Organization

Corporations,
Universities...

Retail

Specialty Resellers

Niche Providers,
Re-branders...

Established Co-Carriers

Long Distance,
Access Providers

Emerging Co-Carriers

Cable Operators,
Utilities...

Internal BUs and Subsidiaries

Res/Small Bus,
Internet Access...

Retail with Multiple Wholesalers

Nationwide
Integrators...

Facilities- Based Provider

Wireless Carriers,
Local Telcos...

Wholesale

Value-Added Service Providers

ISPs, AIN,
Voicemail...

Telecommunications Wholesaler

Emerging Network Providers,
Incumbent LECs...

Video, Wireless Wholesalers

CATV Providers
Wireless Licensees...

Loop Unbundling and Resale are Complex

- Complex business operations to support resale/loop unbundling
- Communication between companies is key
- Coordination within and between companies is required
- Customer Churn will keep transaction volumes high
- CPU impacts will be enormous when volume hits
- Concentrated areas of competition, not a ubiquitous event

There Will Be More Rulings:



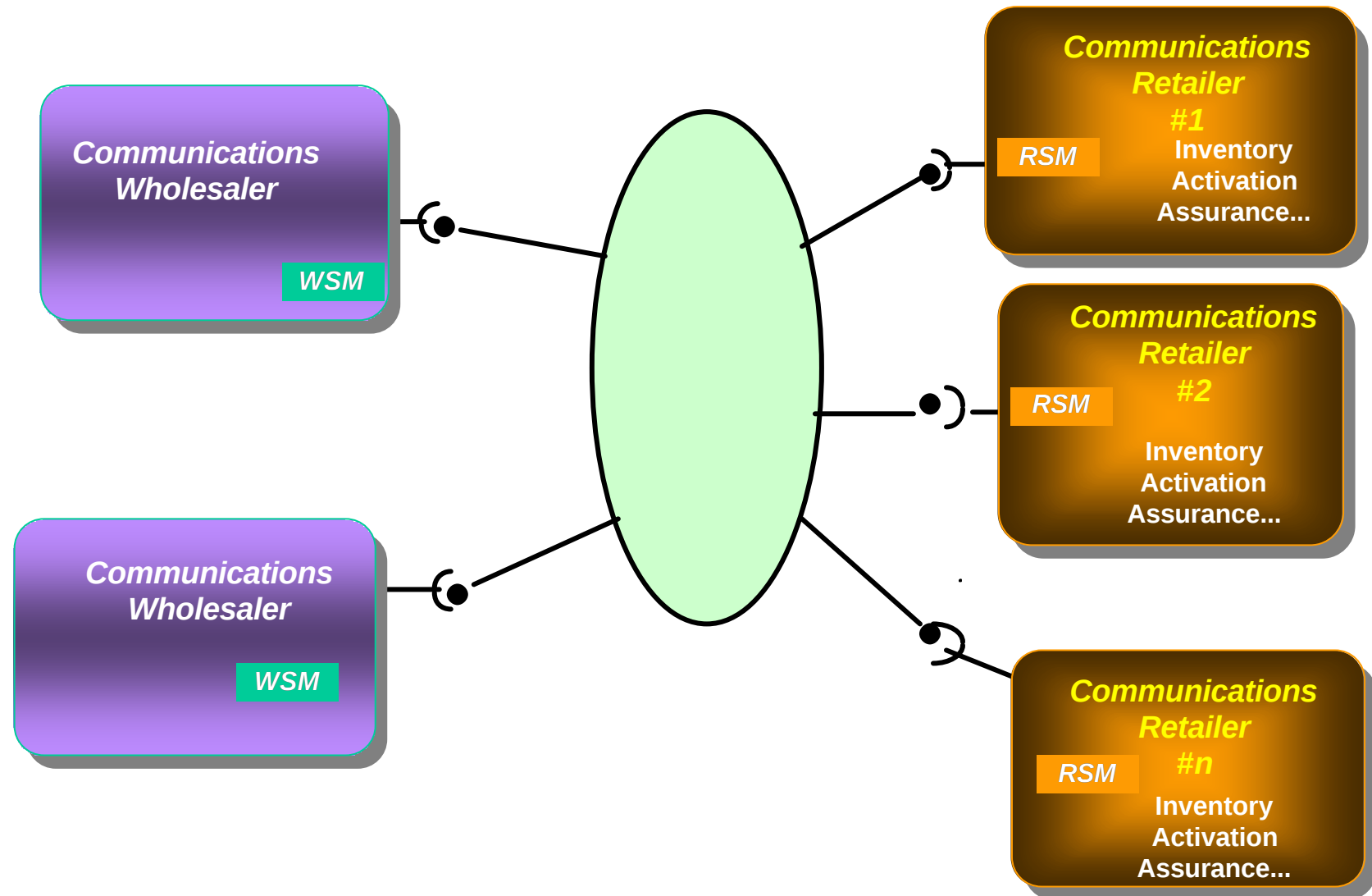
Low complexity

- ✍ Extended out-of-service conditions on carrier switch
- ✍ Manual dispatch to isolate troubles
- ✍ Loop unbundling can be managed on copper / UDLIC only
- ✍ Few volume unbundling points
- ✍ Mix of mechanization / manual assist is acceptable
- ✍ Focus is on pre-ordering / ordering business processes

High complexity

- ✍ Limited/zero downtime on carrier switch
- ✍ Remote testing forced by non-discriminatory metrics
- ✍ Loop unbundling must support all technologies
- ✍ Many volume unbundling points
- ✍ Mechanized flow-through required from day one
- ✍ All business processed must be addressed

Large Scale Interconnection- Target



Business Requirements And Technology Constraints Drive Wholesale Operations Needs

Business requirements are driven by competition and regulatory climate

-  Regulatory requirements on RBOCs to provide full information access to retailers,

Example:

- **Full information access vs. limited. Retailers required to be fully informed of status, e.g., dispatched, etc.**

-  Regulatory requirements to move active customers on unbundled loop with minimum downtime

-  Volume of resale and unbundled orders

Technology Constraints:

-  What technologies will be used for unbundled loop interconnection? DS0, UDLC/IDLC, TR303/TR008, etc

OS Functions Necessary to Enable Local Telecom Competition

Pre-Ordering

- Customer record information
- TN pre-assignment
- Address validation
- Service availability
- Special pricing
- Availability of unbundled NEs

Ordering

- Orders
- Corrections, cancellations
- Directory updates
- Emergency service updates

Provisioning

- Status
- Network modifications, e.g.,
Retailer or Customer Network
Management

Maintenance and Repair

- Trouble reports, open, close, modify
- Test requests
- Proactive notification of failure

Billing Inquires

- Customer inquiries and corrections
- Usage data
- Periodic bills
- Separation information
- Fraud information

Common Retail Needs

Product

- Vertical services
- Quality / Reliability
- Security / Fraud
- Forecasting needs
- Packaging
 - Real-time usage / sales info
 - Feature-rich
 - Loss leader - Upsell new capabilities
- Technologies Needed:
 - Now and Future
 - Timing / Forecasting

Place (Distribution)

- Direct to retailers
- To wholesalers
- To distributor / packager

Price

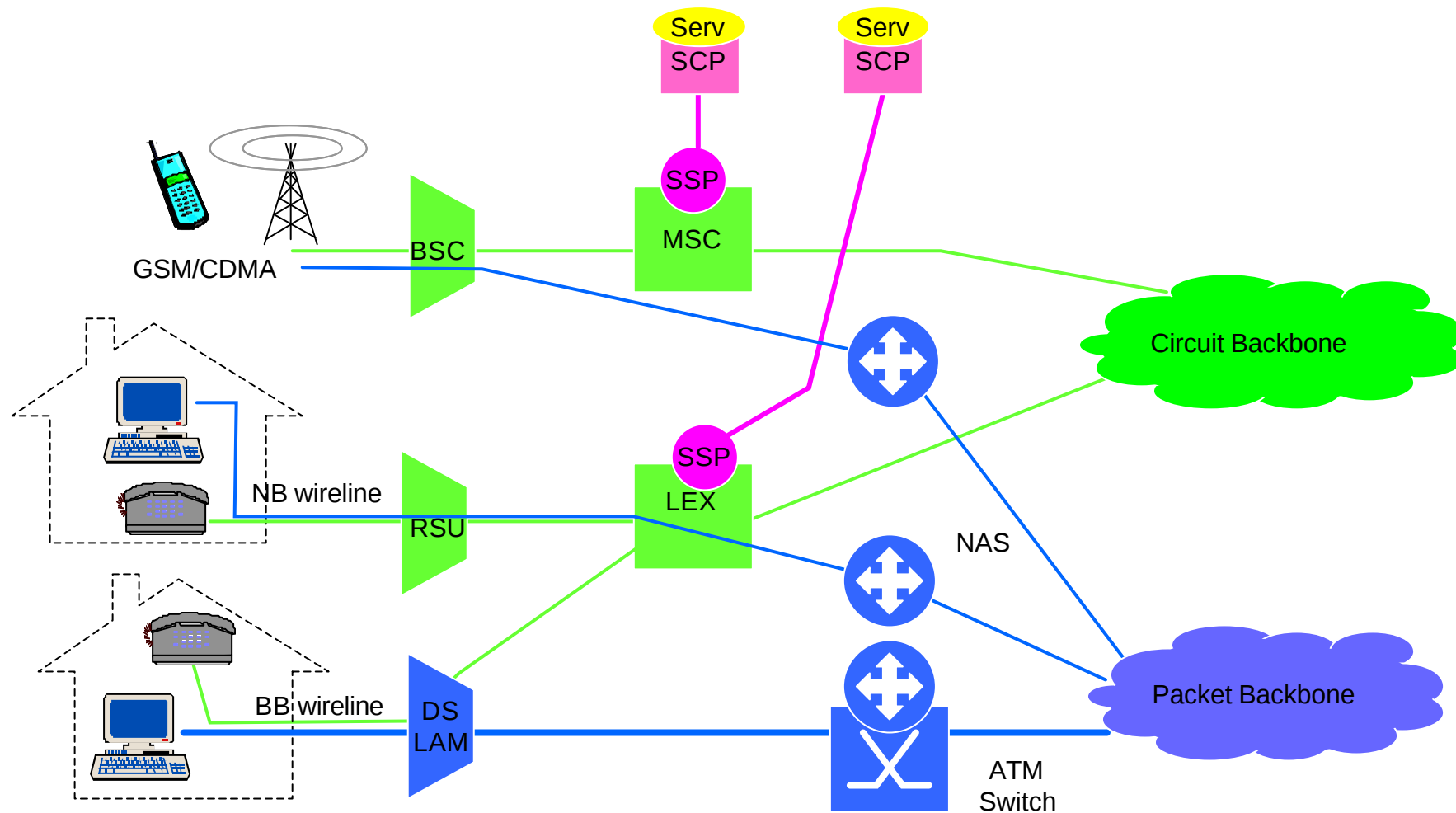
- Real-time rating and discounting
- Volume discounts / timelines
- Reciprocal pricing agreements and methods for compensation

Promotion

- Churn management

III NGN

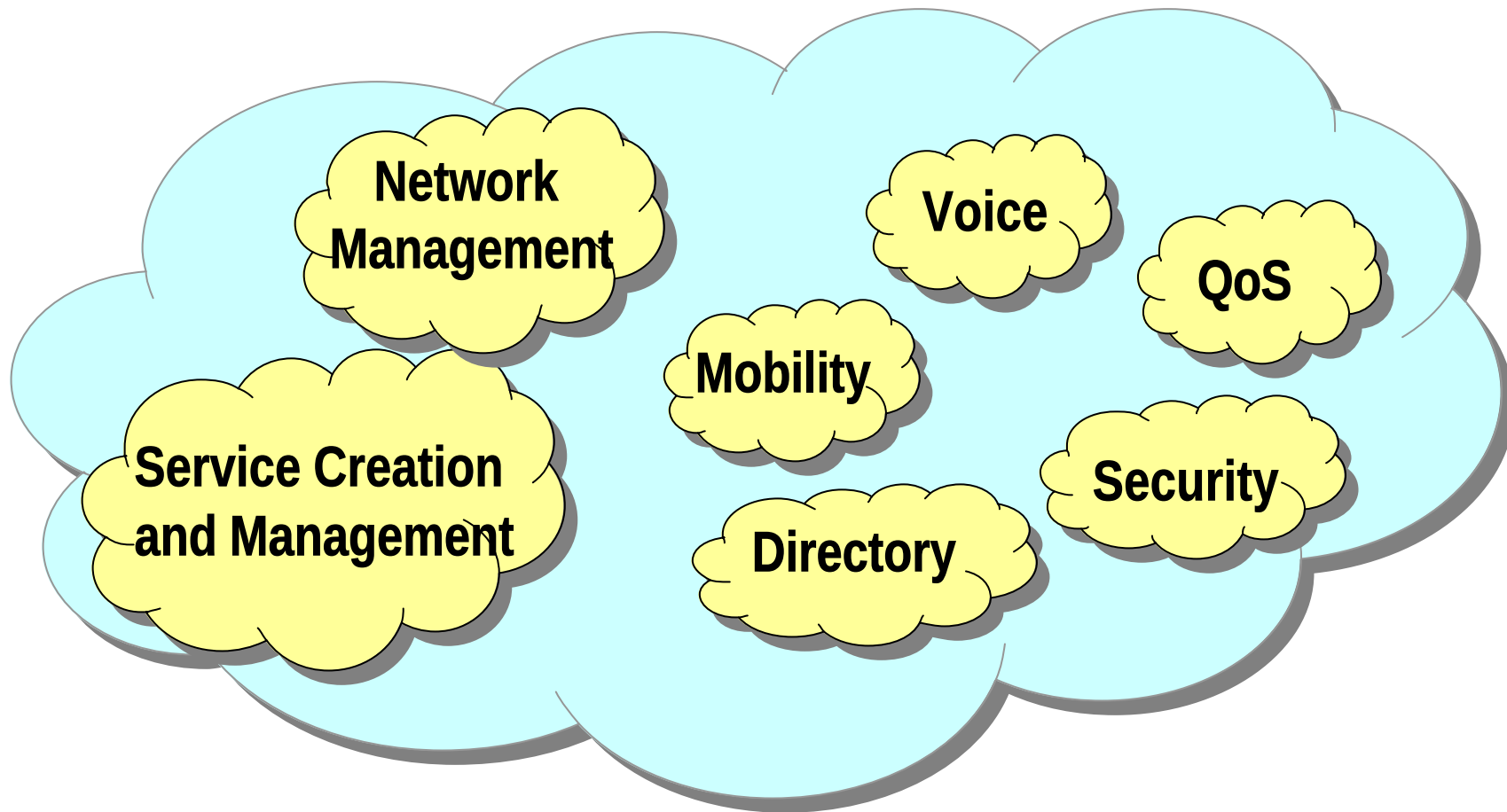
Today: Service dedicated networks



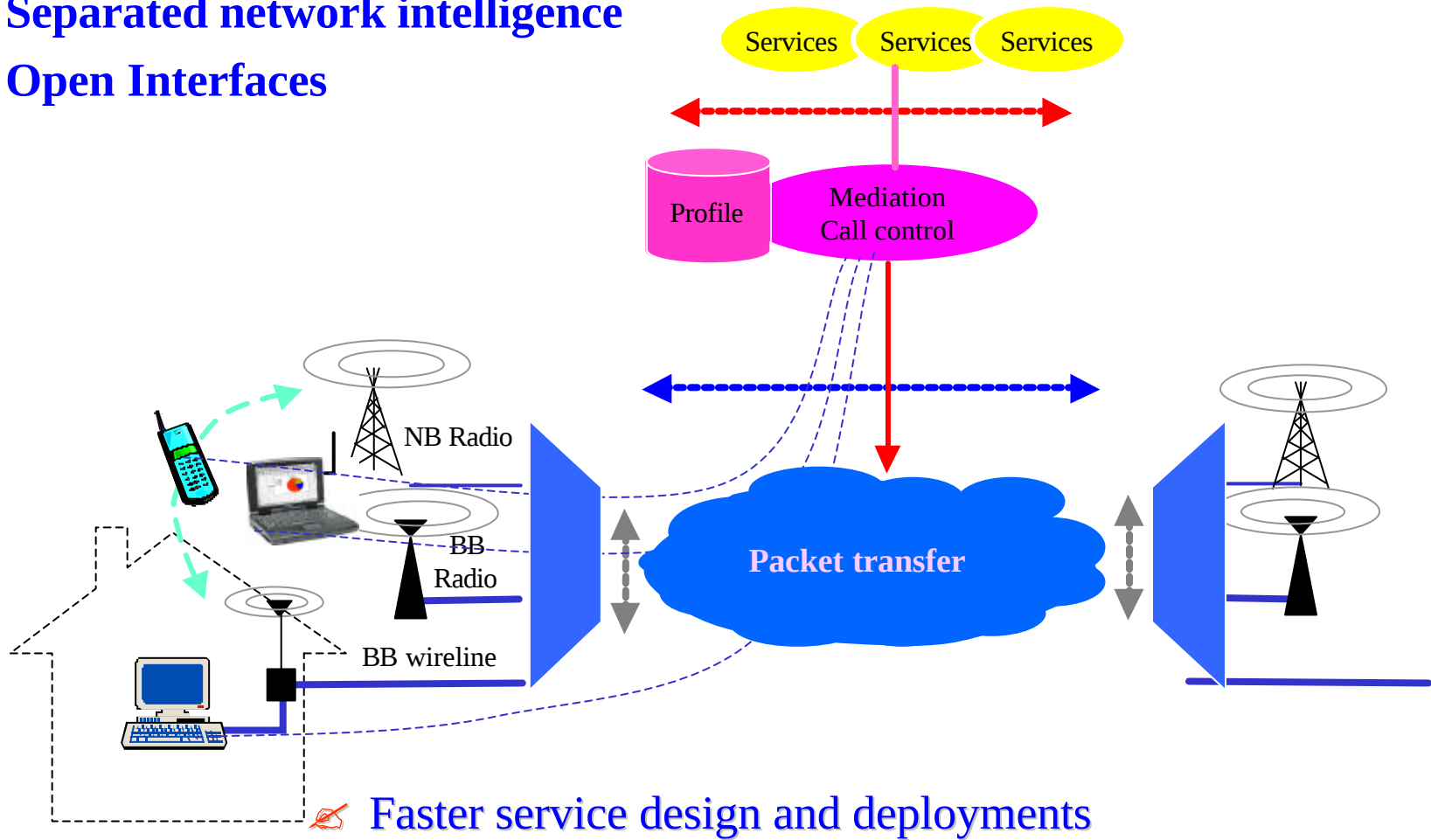
NGN Goal

 **Networks that let you design, create, deploy and operate communication services, tailored to your and your customers' needs**

Next Generation Network



-  **Packet transfer**
-  **Separated network intelligence**
-  **Open Interfaces**



Key Characteristics

- ✍ All application data is carried in packets/cells
- ✍ Broadband Access
- ✍ Optical Networking in the core
- ✍ Open distributed architecture
- ✍ Distributed intelligent layer separates control logic from transport
- ✍ Open platforms and open APIs for creation, provisioning and delivery of intelligent/enhanced services
- ✍ “Web technology” for management of networks and services, including customer “self-management”

NGN

 **Raise the level of architectural standardisation, with defined “elements” to focus on the needs of the Service Creator**

 requires co-operation between ETSI, ITU, etc ...

 **Focus on underlying end-to-end service elements**

 Security

 Quality of Service

 Network Management

 Voice

 **Focus on e-business-enabling elements**

 Directory

 Mobility

 Service creation and service management

 **Architectural integrity is essential in NGN**

NGN Definition

 **NGN is a concept for defining and deploying networks, which, due to their formal separation into different layers and planes and use of open interfaces, offers service providers and operators a platform which can evolve in a step-by-step manner to create, deploy and manage innovative services. (ETSI)**

IV NGOSS

NGOSS: The Concept

 **Industry-agreed, business solution framework for next generation OSS/BSS**

 Driven and managed by TM Forum

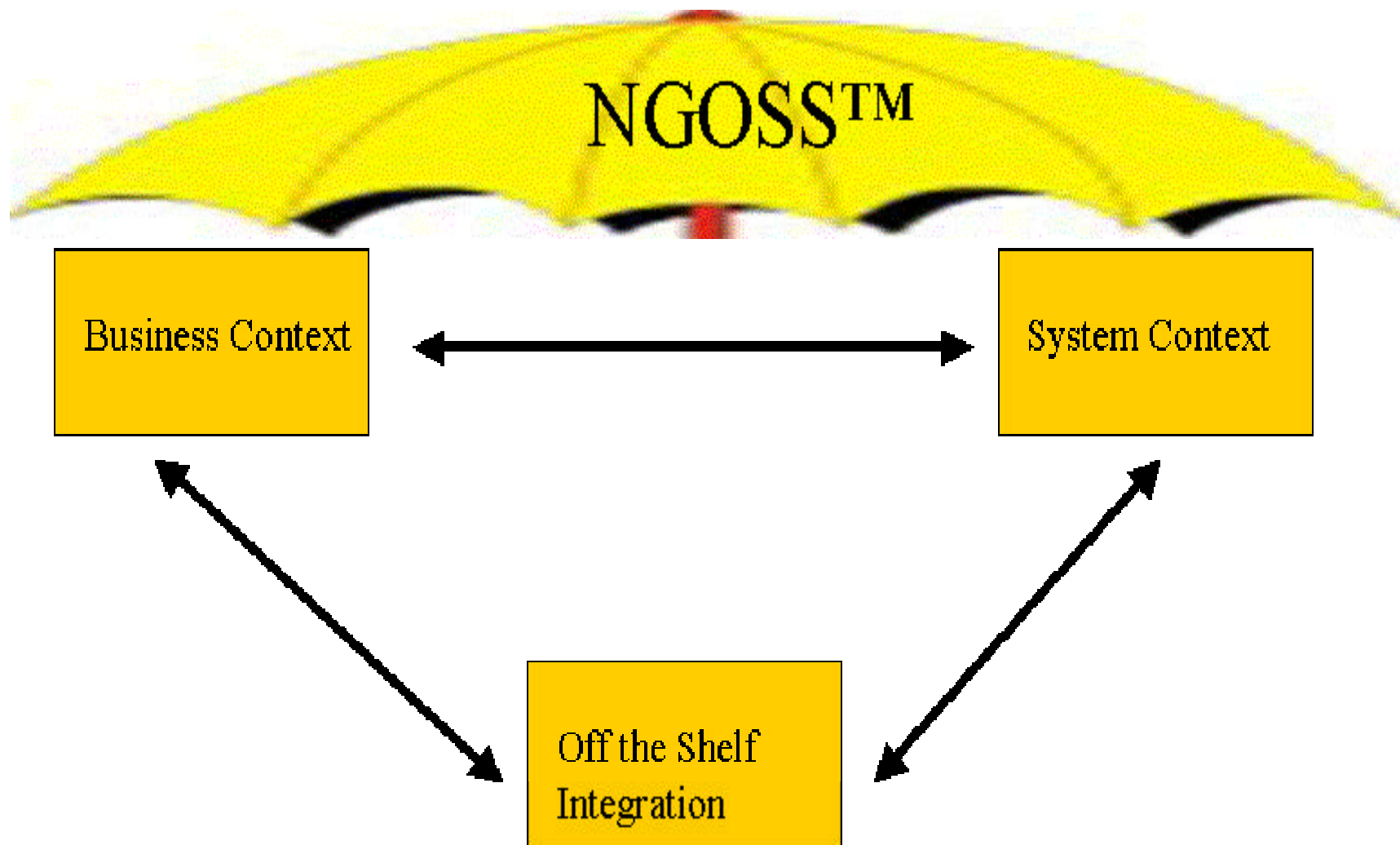
 **The TM Forum's NGOSS is a process-driven model-centric architectural approach that provides the industry with a methodology for developing software system solutions to realize business automation opportunities.**

 **The NGOSS methodology provides a way to identify what to automate in the business, how to automate using software systems and how to implement using commercial off-the-shelf tools, techniques and software**

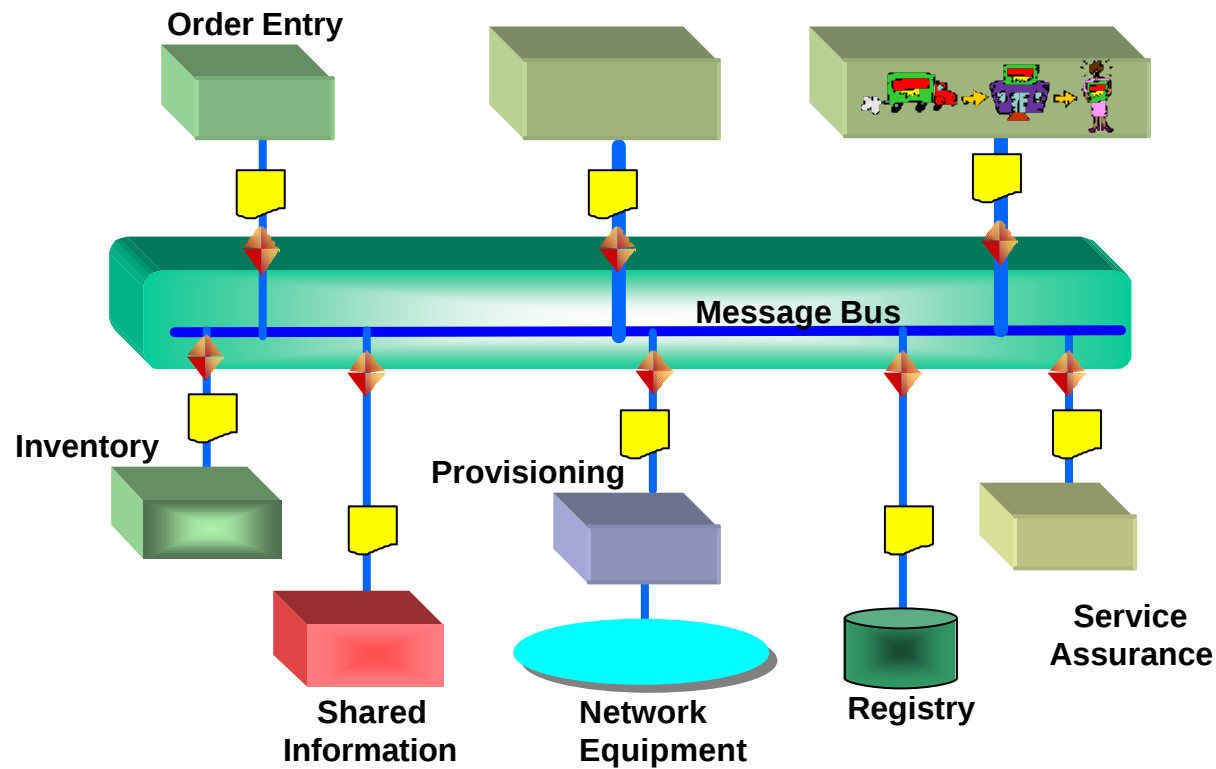
NGOSS

- ✍ A set of principles for making the specification, development, purchase and operation of OSSs easier and simpler.
- ✍ A testing and validation of those principles and analyses through catalyst projects.
- ✍ The leveraging of other industry consortia to get better results faster.

NGOSS Overview



NGOSS Architectural Concepts



Adapter

Process Control

Contract

Component

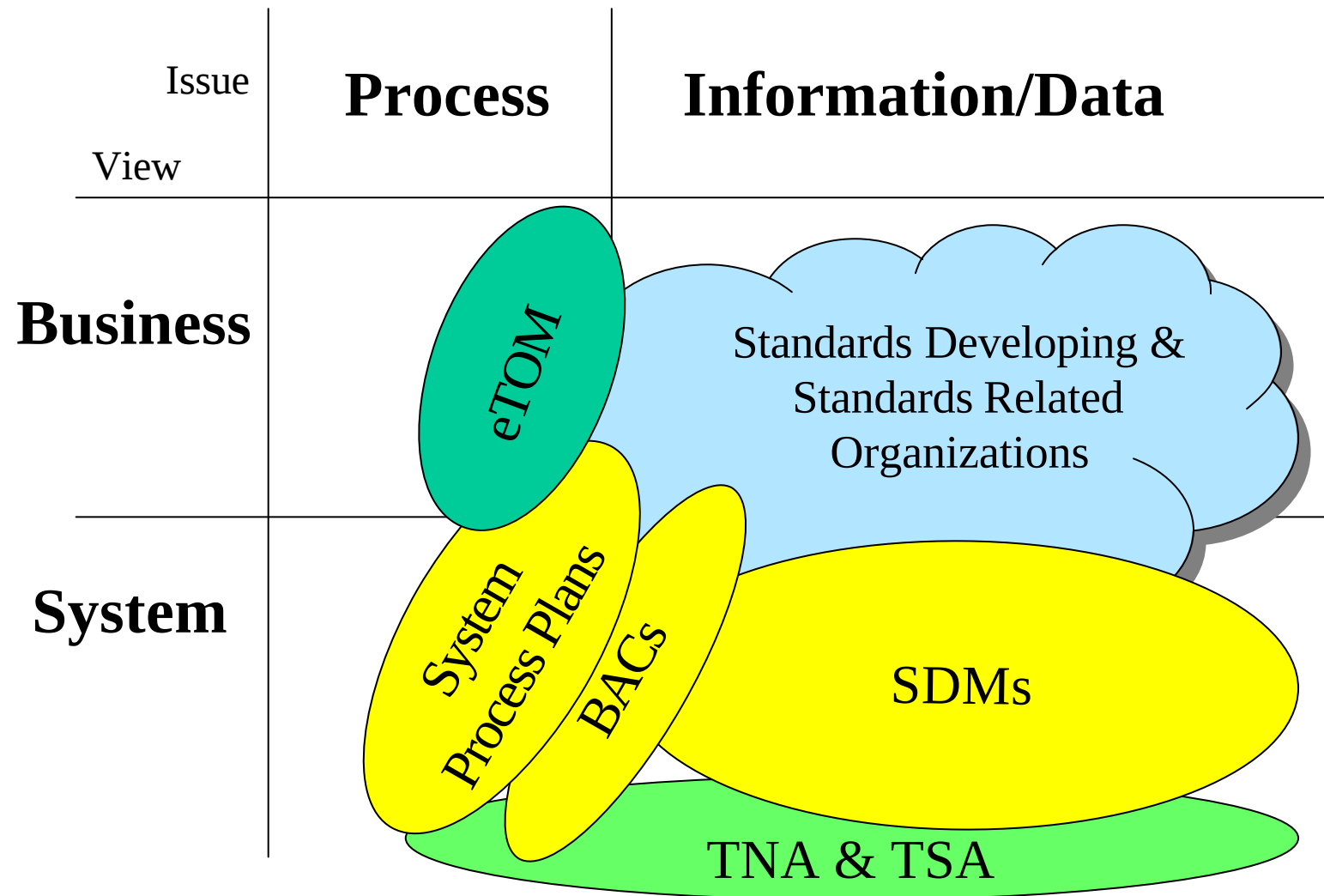
Message Bus

Shared Information

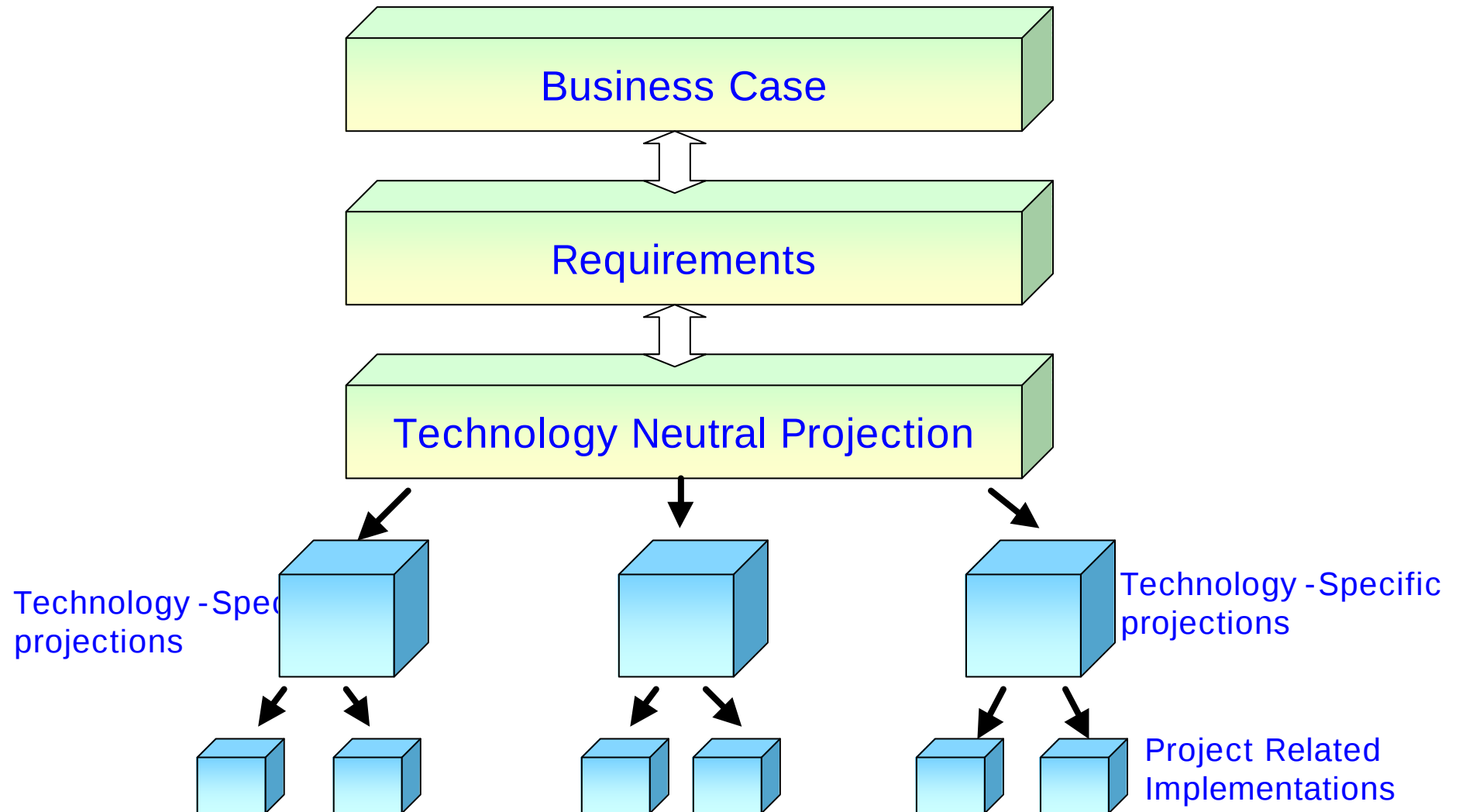
Registry

EzNetSoft, Inc

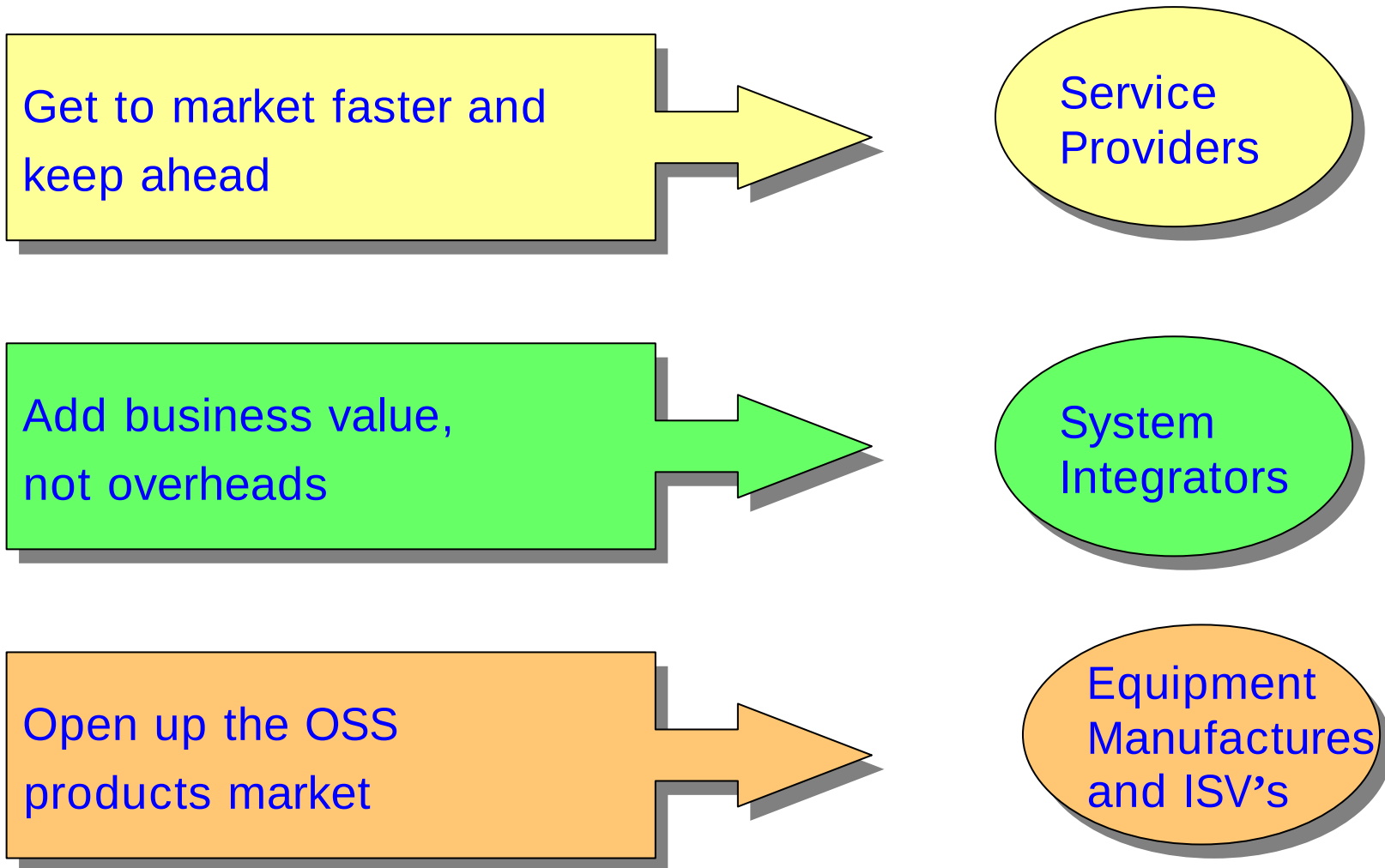
Standard Models & NGOSS



NGOSS System –Project Organization

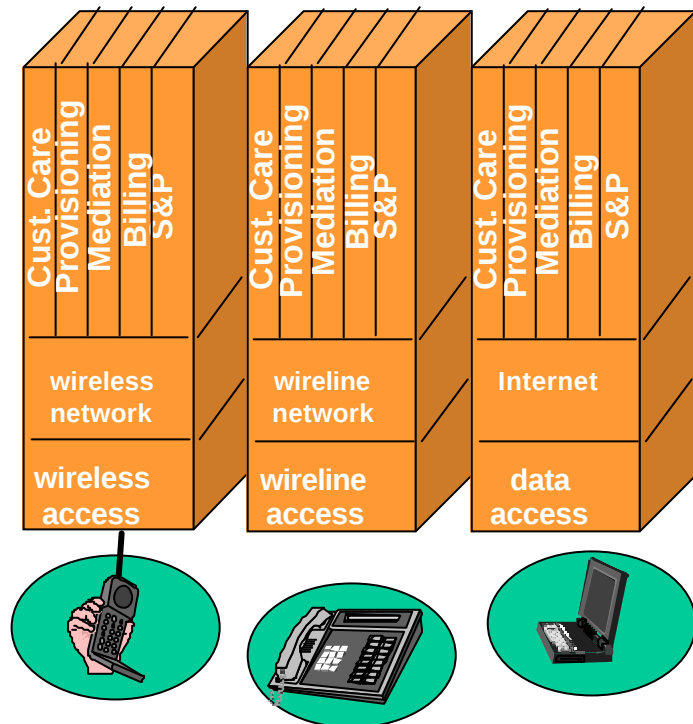


Benefits



Transformation to seamless Services

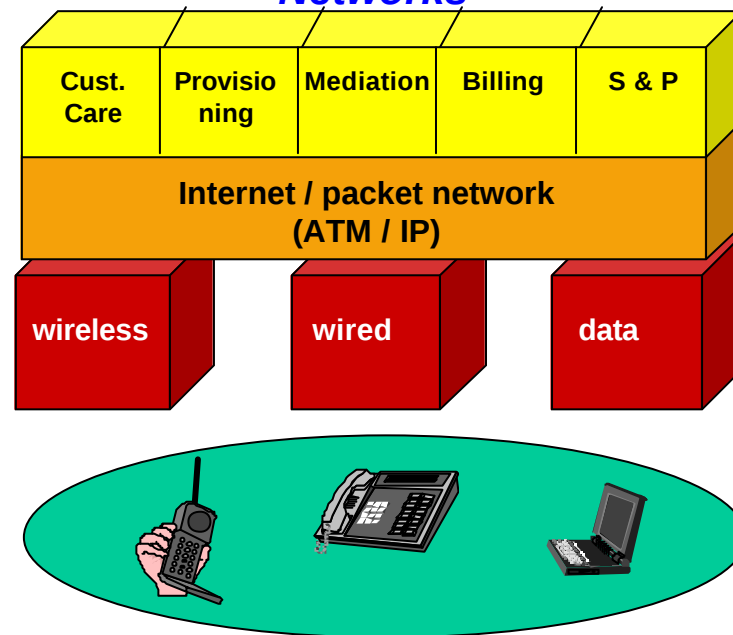
Today's Business Environment



- ✍ Replication of services
- ✍ Network-specific content

Feature and service logic moving further into network and away from access systems.

Next Generation Communications Networks



- ✍ Content-driven environments
- ✍ Seamless, integrated services
- ✍ Access distinctions minimized
 - ✍ wireless and wireline
 - ✍ voice and data

The Steps

-  **Business Process Modeling**
-  **Automation Opportunity Selection**
-  **Process Plan Analysis**
-  **Contract Construction/Shared Data Development**
-  **OSS Integration**
-  **Technology Selection**
-  **Implementation**

Business Process Modeling

 **Done by the eTOM team and BPM modeling teams**

 **Not systems focused**

 **Contains in Business Terms**

 Definitions of the Business

 Hierarchy of the processes

 Definitions of the critical “information entities”

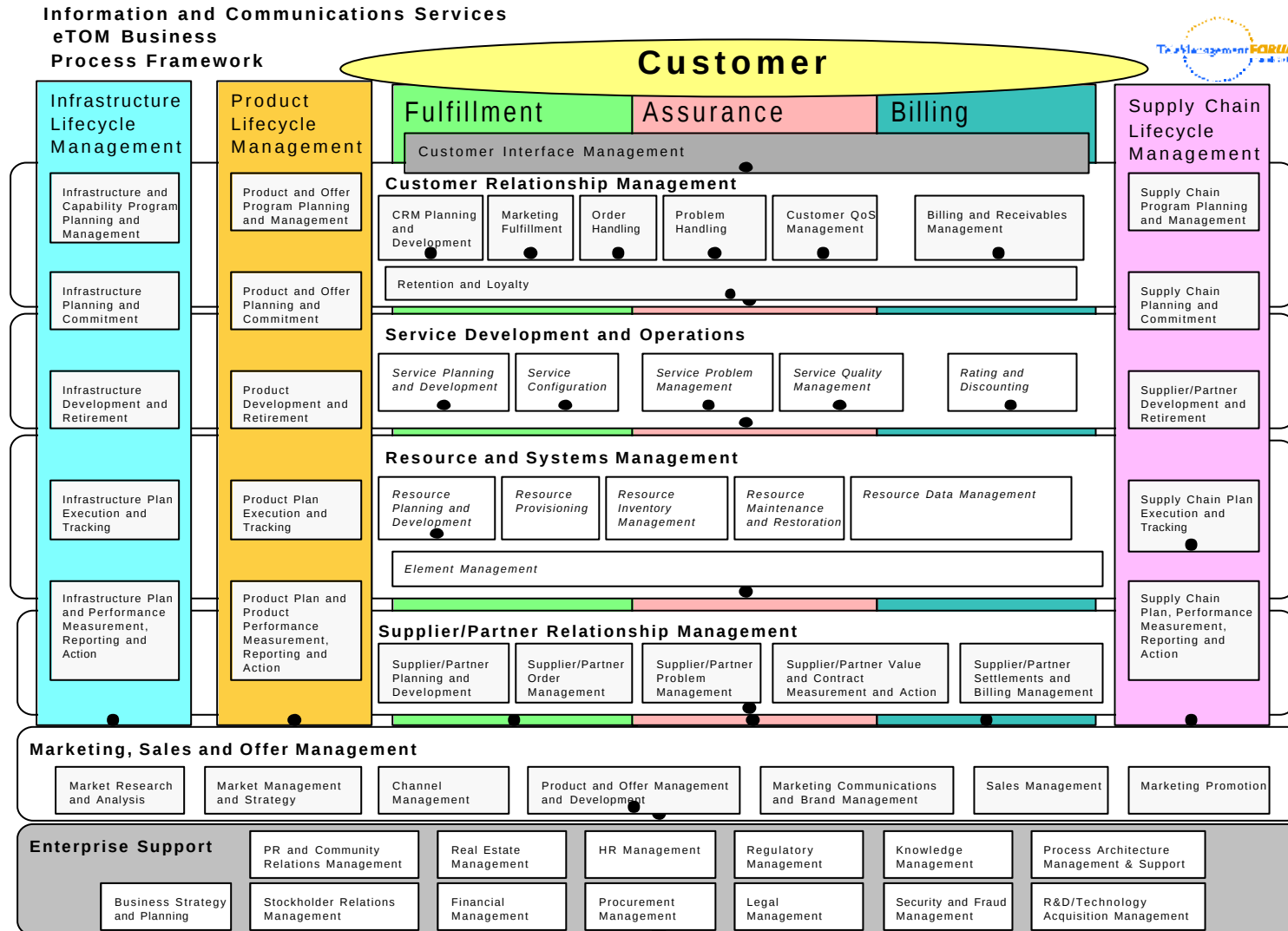
 Flows of control and information between process steps

 Key decision points

 Requirements for possible automation

Business Process Modeling

4/1/01 11:41:47 PM Model Model for Italy: Business Process Framework Sunshine [G1]



Automation Opportunity Selection

-  **Done by any team**
-  **Identify a process, or part, that is to be automated through the use of systems**
-  **Identify the reasons why and the requirements for automation**
-  **Each “opportunity” will become an analysis task for the BAC/SDM team and appropriate modeling teams and catalysts**

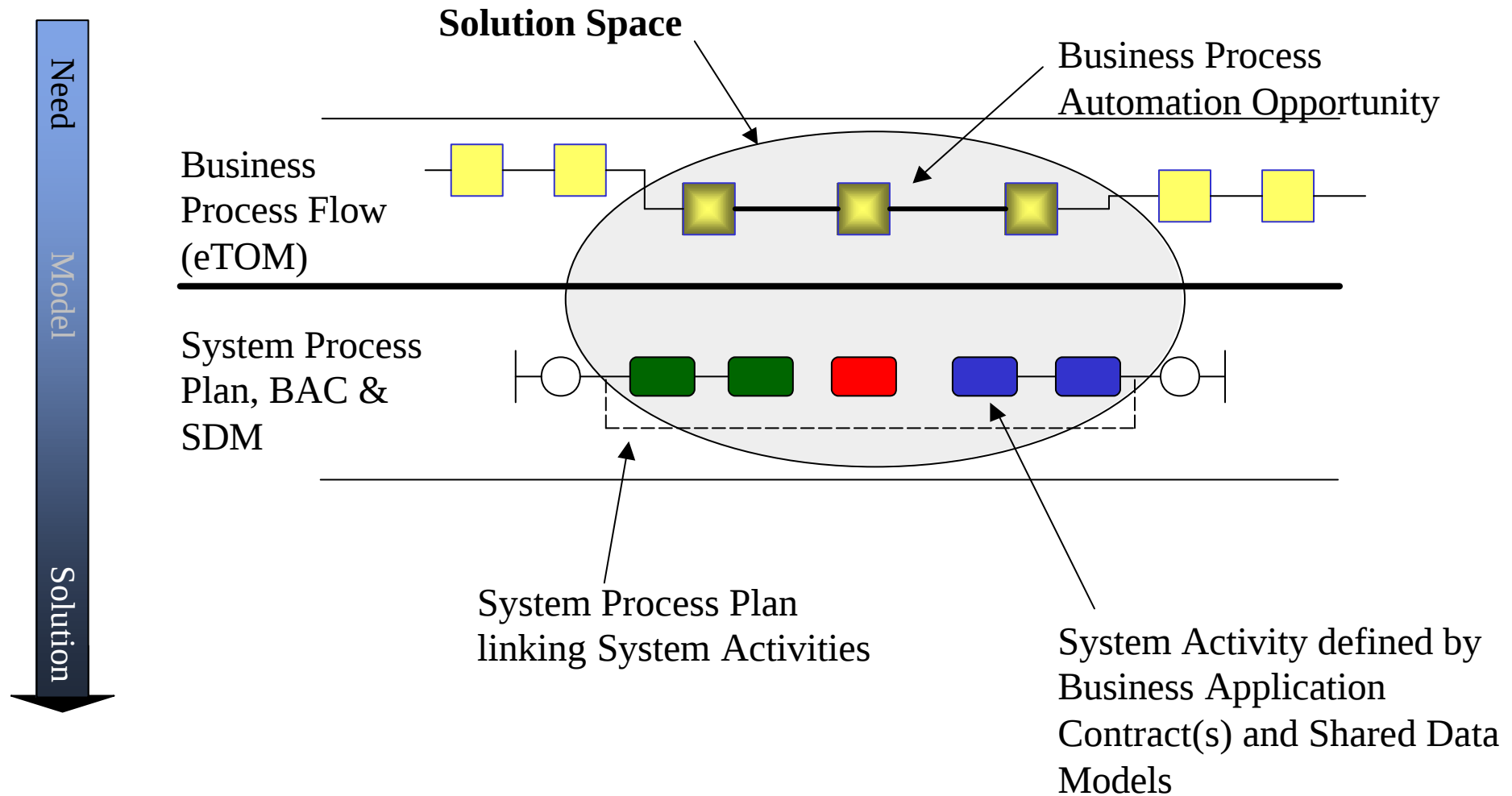
Where are the Automation Opportunities?

- Plus Factors
 - High volumes
 - Time requirements
 - Steps that are error prone
 - Tight coupling between computers (swivel chair)
 - Auditing and data validation needed
 - More use of legacy data
- Minus Factors
 - Complex intelligent decisions
 - Mismatches of BPM (e.g. legacy process)
 - Mismatches of systems architecture (NGOSS)
 - Exposure of private or proprietary data

Process Plan Analysis

-  **Documented in BAC/SDM team or appropriate modeling teams.**
-  **Start of the “systems viewpoint”**
-  **Identify the part of the process automated**
-  **Identify the use case for that automation**
-  **Analyze the process automated and break it into “activities”**
-  **Start MVC analysis of activity into contracts and shared-information.**

Process Plan Analysis



BAC – Business Application Contract

SDM – Shared Data Model

Contract Construction and Shared Data development

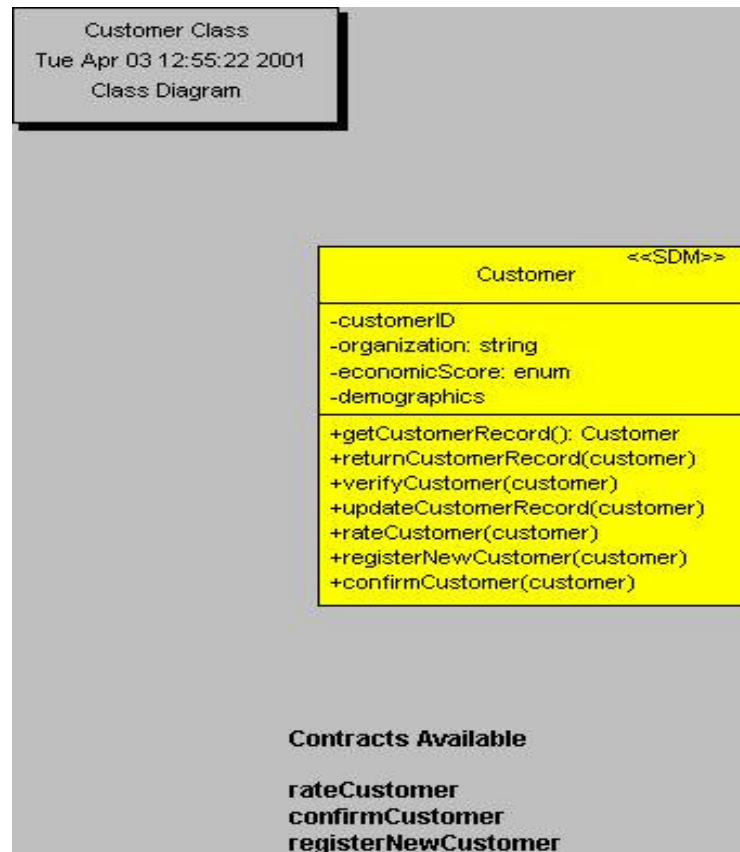
-  **Documented by the Catalysts and the systems focused modeling teams**
-  **Locate the activity that needs the contract**
-  **Document the API and all of the ancillary requirements**
-  **Place in the technology-neutral format**
-  **Link in the repository**

Contract Construction

Rate the Customer		
Base	Identifier	Rate the Customer
	Version	0.3
	CDO	TMF
Extends	Identifier	XXXX
	Version	XXXX
	CDO	XXXX
Behavior Description		
Score the economic value of this customer to the enterprise. Note: this contract may be decomposed into sub-contracts (e.g., credit rating, product affinity, relationship status)		
Interaction Model		Request/Response UN/CEFACT
Formal Arguments (from SDM)		
IN / OUT / INOUT	Name	Type
In/Out	BuyerInfo	Customer
Out	EconomicScore	Enum
Out	Return Code	returnCode
Preconditions		
Notes	This value will be within a range determined by business agreement between the provider and consumer of this information. Possible values: Platinum, Gold, Silver, Bronze and Lead	
Post conditions		

	Platinum, Gold, Silver, Bronze and Lead
Post conditions	
Success (to completion)	Return Code = Success or Failure
Failure (to completion)	None
Runtime Abort	None
Notes	None
Exceptions	
Preconditions Not Met	None
Post conditions Not Met	None
Runtime	Rating Service Unavailable, Timeout
Dependencies	
Other Contracts	None
Framework Services	None
Process Manager	None
Notes	
SIM:	
Customer.Customer.CustomerDataAdministration.CustomerAccountCredit	
Hold for Technology Specific Details!	
Hold for Contract Activation Details!	

Shared Data Development

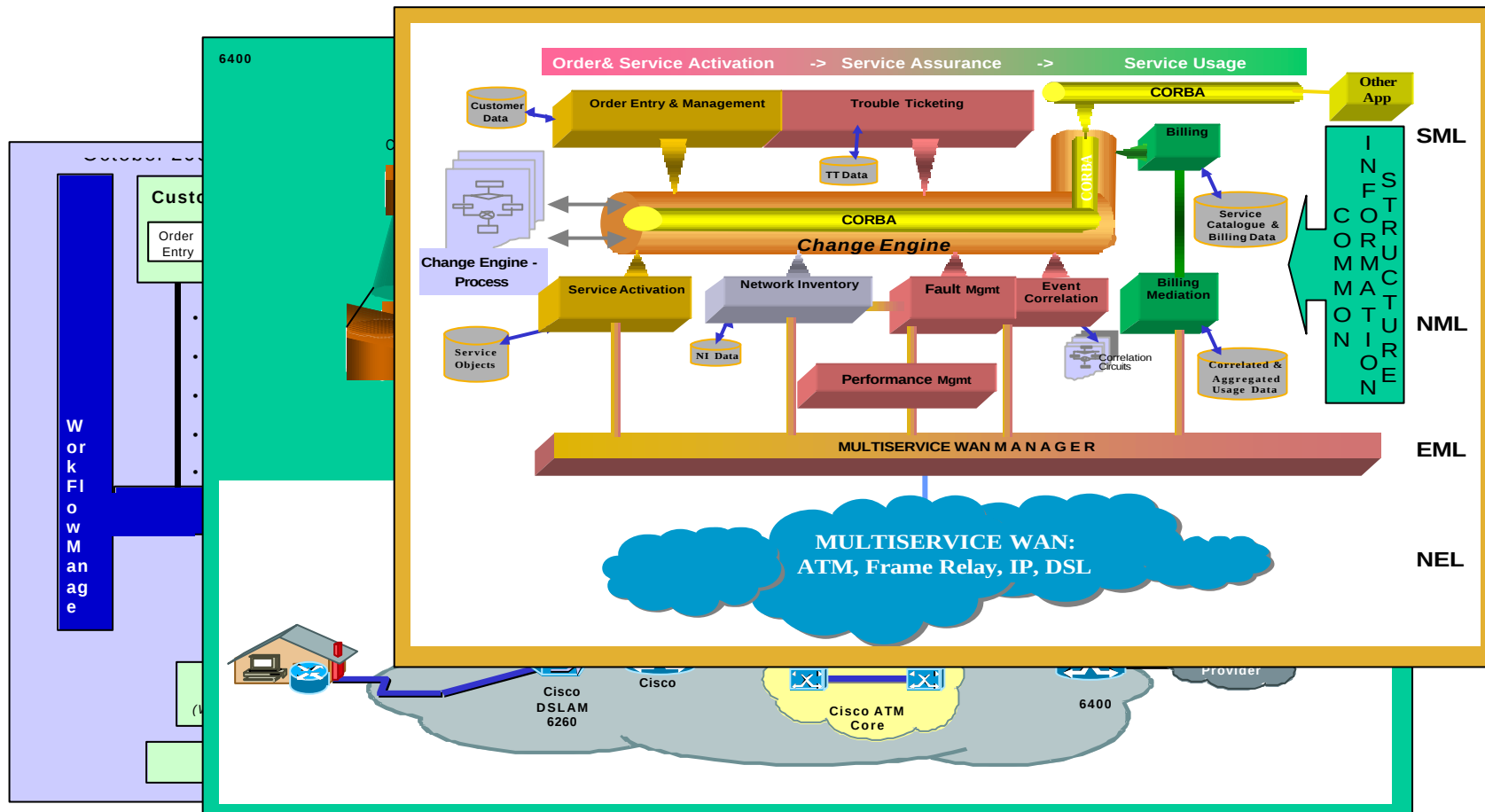


-  **Shared Information Concept**
-  **Attributes and Operations**
-  **Contracts for automation of activities**
-  **Signatures**

OSS Integration

- ✍ **Done by catalysts and the marketplace.**
- ✍ **Map contracts into OSS products**
- ✍ **Integrate Activities through Process Manager (the NGOSS Principles)**
- ✍ **Tailor and extend as customers want.**
- ✍ **Learn from the catalysts and give them things to try.**

OSS Integration



OSS Integration

-  **Have a base architecture (e.g. a reference)**
-  **Buy components that support the contracts needed to automate the processes desired.**
-  **Pick the best technology for the job.**
-  **Bridge between technologies for B2B and complex installations**

Technology Selection

-  There are many “full featured” integration and infrastructure technologies
-  The SP selects the one they like
-  The ISV builds a component that can plug into many different technologies
-  The SI makes it all work.
-  The current ones we are working on are
 -  Corba, J2Ee, XML/SOAP (point/point or pub/sub)

Implementation

-  **The Unified Method of Software Development**
-  **Requirements traceability**
-  **Automated tools**
-  **Reference code and testing**

TMF NGOSS

- Business Context

- TOM/eTOM
 - Business Process Model
- Specific Business Process Models
 - Mobile
 - IP-VPN
 - SLA
 - Ordering
 -
- BAC/SDM Models

- Systems Context

- Systems Integration Methodology
- Technology Neutral and Specific Architectures
 - Principles
 - Framework services
 - CORBA
 - J2EE
 - XML/SOAP
 - Pub/Sub
 - Legacy Systems Access

TMF NGOSS

- Off the shelf Integration (Catalyst Projects)
 - DSL
 - Multi-Technology Management
 - Broadband Services
 - Mobile Configuration
 - Customer Care
 - UMTS
 - SLA
 -
- Knowledge-base
 - Web Portal to Information
 - Documents
 - UML Models
 - Interface Agreements
 - Reference Code
 - Technology Use Notes
 - Catalyst Descriptions and Integration Plans

Keys to OSS Success



Accessible Data

Universal data models for network & service objects



Ease of Integration

Open, published interfaces that are based upon existing standards



Scalability

Modular software that utilizes the published interfaces



Data integrity

Flow-through & flow-back data management processes



Flow-through Processes

Pre-integrated, pre-tested applications

V. Telecommunications and the New Economy

Technology Timeline

-  **1997: The landing of Pathfinder probe on Mars is watched in real time on the internet by millions**
-  **1998: Matt Drudge breaks Monica Lewinsky scandal on the Internet**
-  **1999: Independent record label Sub Pop begins distributing music over the Net using MP3**
-  **2003: E-commerce annual revenue exceeds US\$1.8 trillion**
-  **2005: Network TV all but ceases to exist**
-  **2007: Last music CDs roll off the assembly line – all music downloaded off the Web**
-  **2008: People regularly implant chips in their bodies as part of their personal area networks**
-  **2009: Most household appliances plugged into the Net**

UBS Warburg

New Technology

There was no

**WWW /
HTML**

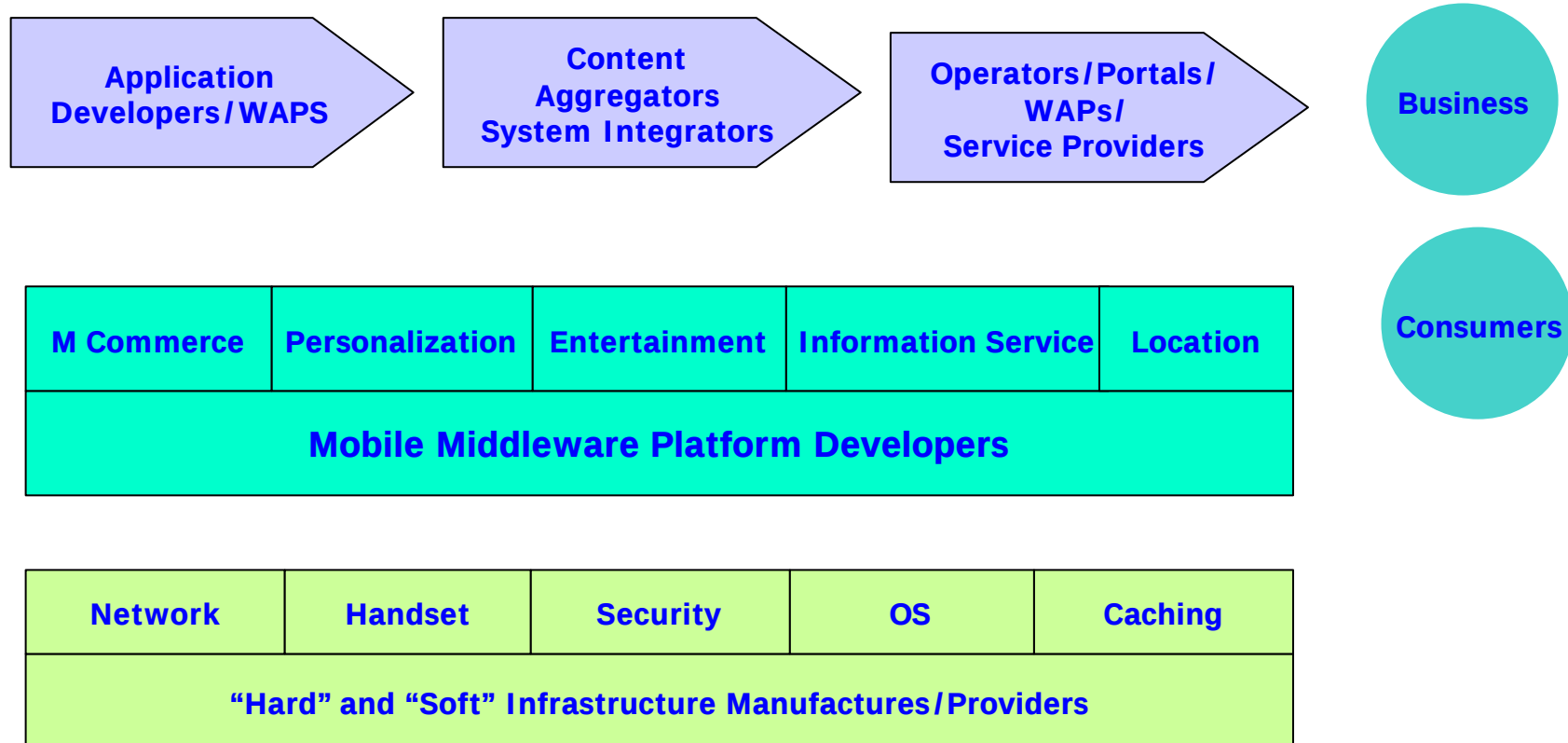
**Blue
Tooth**

**PDA
PHONE**

JAVA/XML

10 years ago

Mobile Internet Universe



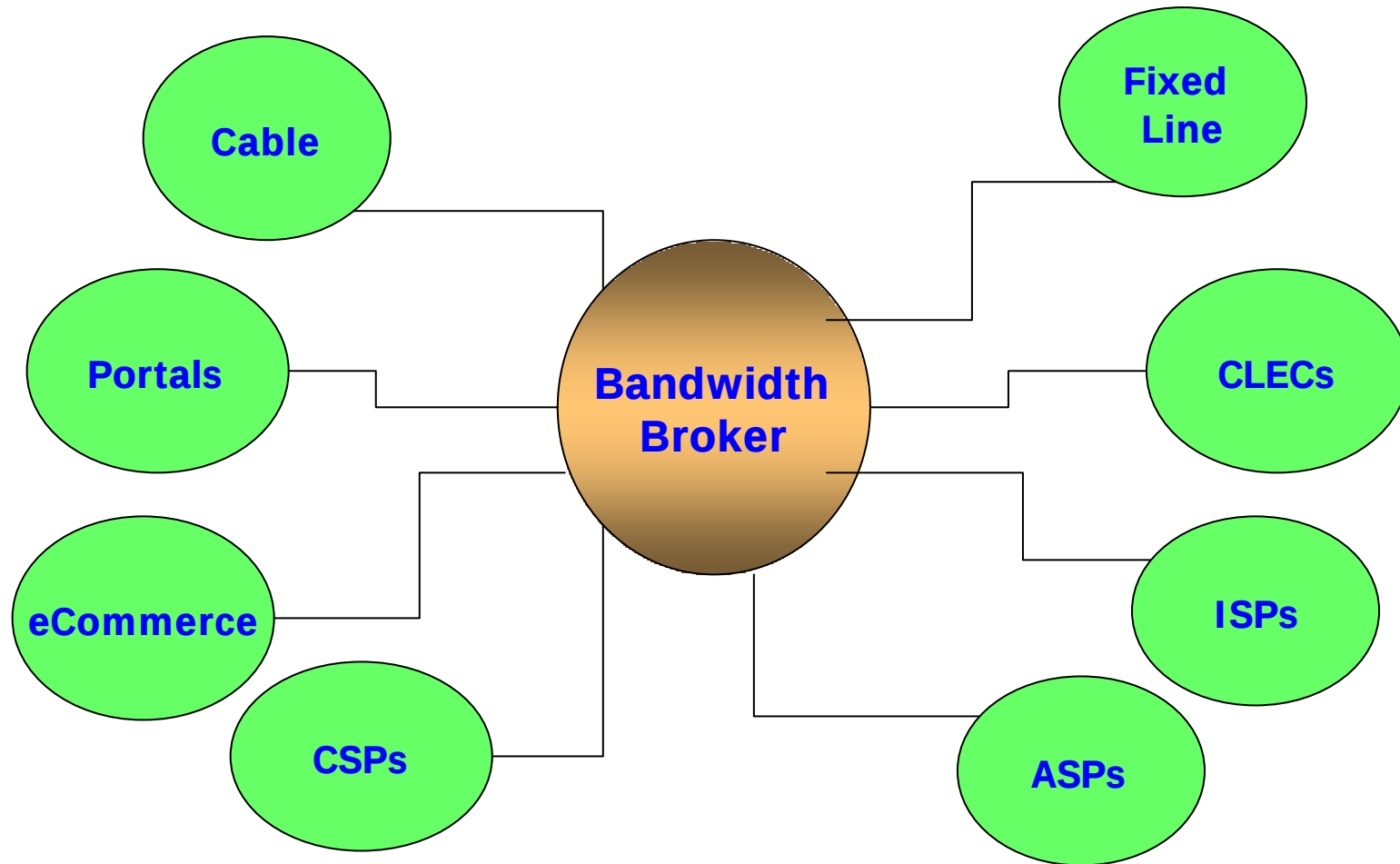
e-Commerce and m-Commerce

Under e-Commerce, we have B2B, B2C, and C2C

-  Business to Business (e.g. VerticalNet, Chemdex)
-  Business to Consumer (e.g. Amazon.com, Lastminute.com)
-  Consumer to Consumer (e.g. e-Bay, QXL)

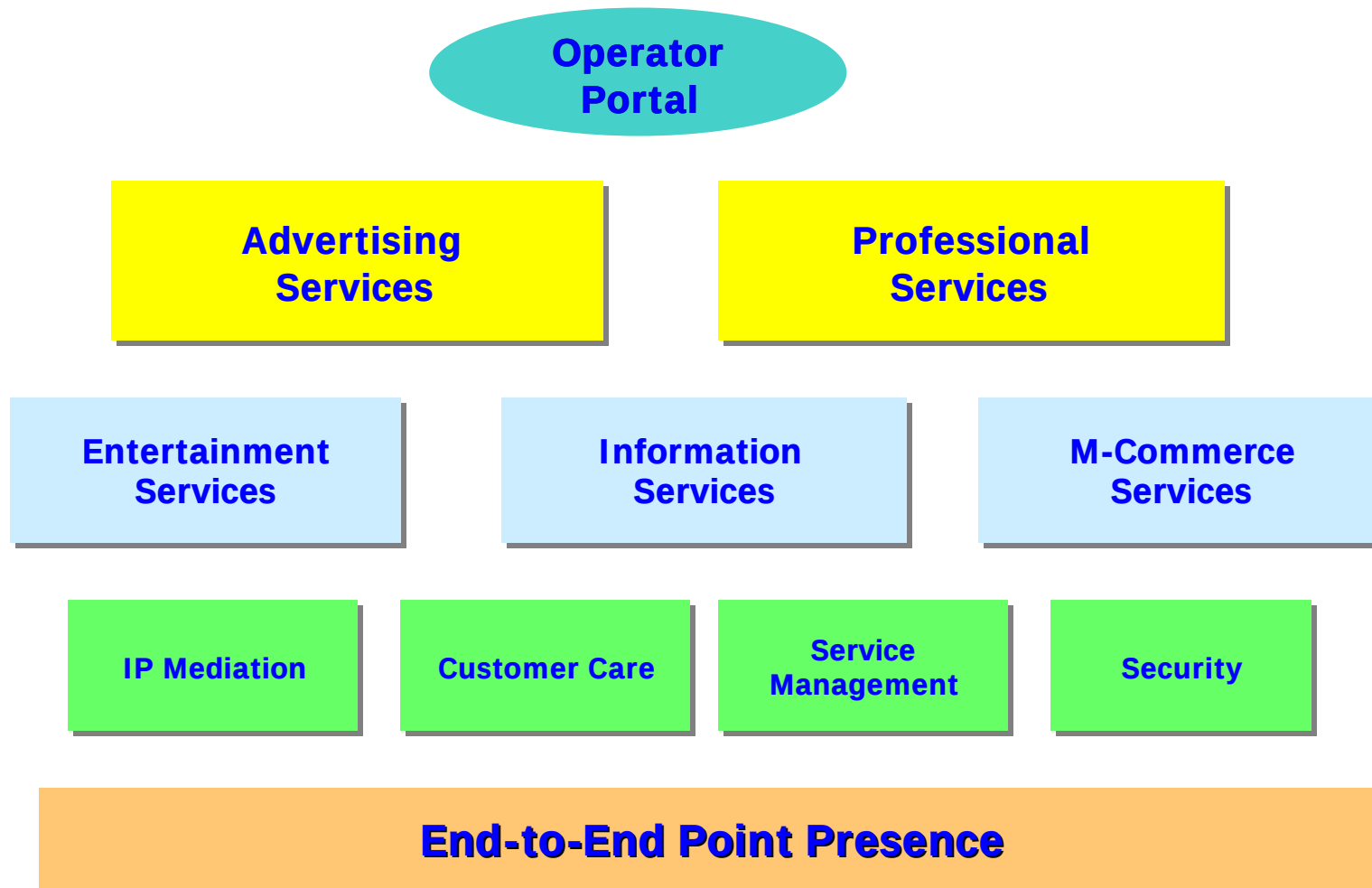
M-Commerce include a new universe of services that will exploit the mobile internet including entertainment, location, transaction and mobile internet facilitation

Bandwidth Broker



Facilities-based WASP: end-to-end

End-to-End Service Delivery Model



Examples

- ✍ Threshold Server Module - Service providers can manage risk by initiating actions when thresholds are exceeded, enabling them to control revenue loss, especially for prepay services.
- ✍ Split Usage Rating Feature - Service providers now have more criteria for splitting use to assign various rates for the same usage event, helping service providers to prepare their business for next generation, complex mobile and IP pricing schemes.

eBusiness Context

eBusiness Success Consensus– TMF Market Research

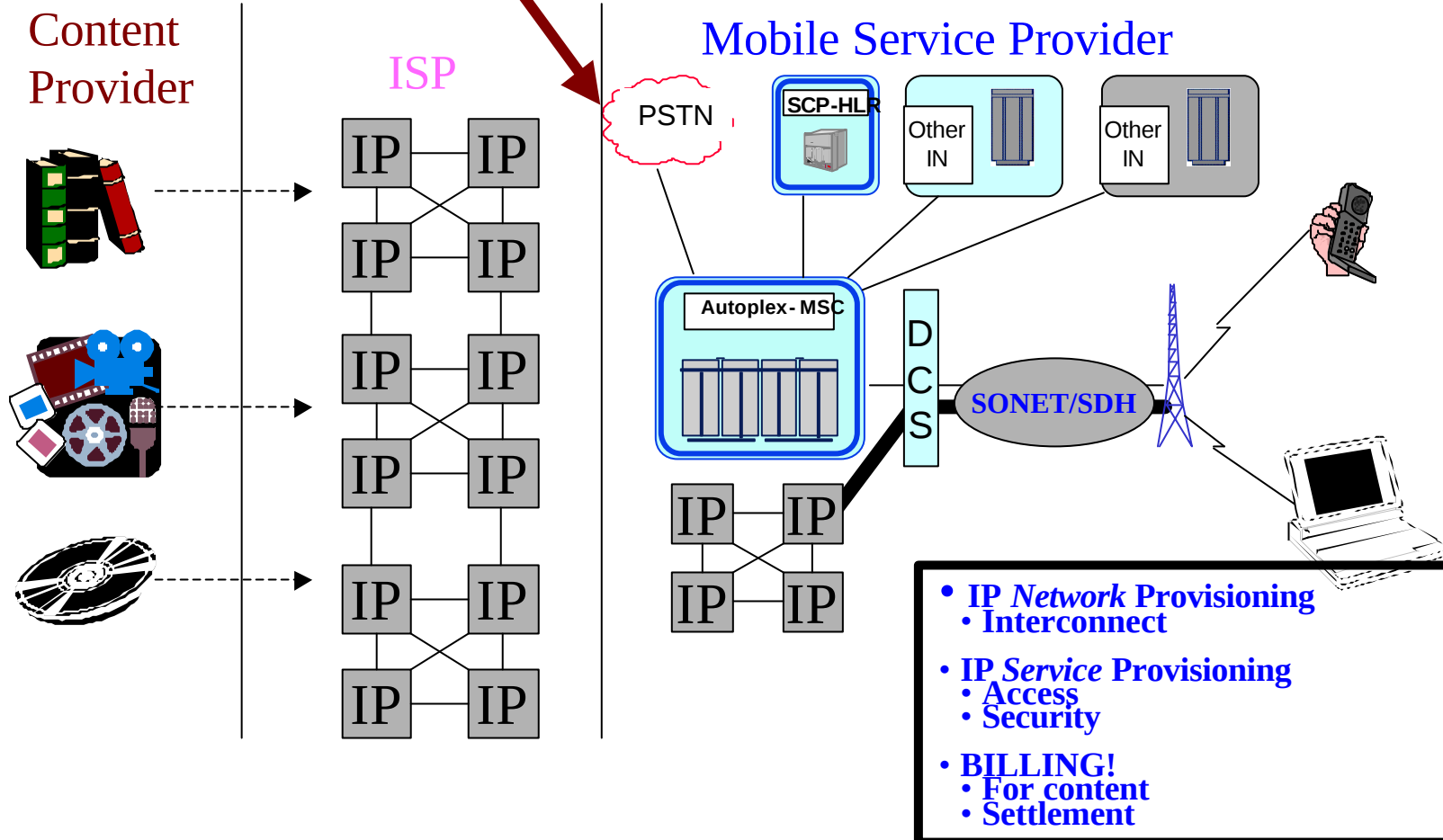
-  Ebusiness/ ecommerce cannot be an island within enterprise
-  Excel at managing customer relationship and value network
-  Streamline Supply Chain and drive automation
-  Operations processes mean as much as online ones
-  Executive Management understands and applies what technology can enable

eBusiness Processes are Different

-  Processes are modular, rule based, non- linear, more integrated
-  Sales and service processes converge with significant customization, personalization and integration for a specific customer
-  Flexible Fulfillment, convenience, speed
-  Customer self- management is priority

Mobile Internet: Q: Where's the Operations Challenge?

Answer:
Right
Here!



VI

Why does the OSS we have today need to change?

-  **IP services involve logical components beyond the network and service layers**
-  **This has changed the model of services from vertical silos to cross-domain data models**
-  **OSS that support the service must reflect the new cross-domain relationships**
-  **Current legacy OSS does this very poorly as it was designed to support very static network services**

OSS Capabilities

Service Management

-  BSS – Customer Care and Billing
-  OSS – Service Delivery and Service Assurance

Service Delivery

-  Order Management
-  Provisioning
-  Design and Assign
-  Activation

Service Assurance

-  Fault Management
-  Event Collection
-  Correlation and Filtering
-  Prioritization
-  Notification

OSS



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flow-through

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Management Center

(Call Center) Operation
(



)

(



(

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)



(Service Quality)

 QoS management

 Reliability



(Speedy Provisioning)

 Total end-to-end solution

 Flow-through operation



(Strategic Support)

 Policy-based management

 Scalability



(Open OSS)

 Customer network management

 Customer billing to reflect QoS



OAM



,



Pre-Service:

(

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)



In-Service:

(

,

,

)



After-Service:

(

)



Digital Asset DB



e-Commerce

Service Development and Operation Process

Customer QoS Management ()

- Personal Data
- Service Data

Service Problem Management ()

- Trouble Administration
- History Data
- Service Data

Service Quality Management ()

- SLA (Service Level Agreement) Data
- Business Agreement Data



(Customer-Oriented)



One-stop



(Business-Oriented)



Time-to-Market



(Service-Oriented)



Flow-through



(Automation-Oriented)



()



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Future Work

I.

a. ()

b.

c. 가

II.

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III.

IV.

V.

a.

