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Introduction to NGOSS

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Agenda

- 9.00 Welcome
- 9.00 NGOSS Background and Basics
- 9.30 NGOSS Lifecycle and Methodology
- 10.00 NGOSS eTOM Overview
- 10.30 Break
- 11.00 NGOSS SID Overview
- 11.30 NGOSS Architecture Overview
- 12.00 NGOSS Documents and Specifications
- 12.30 Lunch
Housekeeping

- Courtesy
  - Mobiles, Pagers, etc.

- Q&A
  - During Breaks, Start/End of Sessions, End of Day

- Feedback
  - Evaluation Forms
NGOSS Background and Basics

Cliff C. Faurer, TM Forum
Technical Director – NGOSS Program
NGOSS Steering Council
NGOSS Architecture Board
NGOSS Lifecycle and Methodology Team
NGOSS SID Team
Agenda

➤ NGOSS Background & Basics

➤ NGOSS Lifecycle and Methodology

➤ NGOSS eTOM: Business Processes

➤ NGOSS SID: Shared Information Data Model

➤ NGOSS TNA: Technology Neutral Architecture

➤ NGOSS: Documents and Specifications
What is the TM Forum?

- Non-profit global consortium focused on Business and Operations Support Systems (BSS/OSS) and management issues for the communications industry
  - Service providers, software and hardware suppliers, systems integrators
- Source of leadership, knowledge, technical solutions and market awareness for the industry - 380+ members in 36 countries
- Provides a collaborative environment in which companies can address service providers’ most critical business and technical requirements
- Provides an on-line knowledge base featuring industry information and potential solutions.

NGOSS Lean Operator
What are the Challenges!

- **Service Price** - can’t drop costs fast enough to keep up!

- **Service Types**
  - Commodity services - razor thin margins, demand efficiency
  - Advanced services - better margins, demand flexibility

- **Service Lifecycle**
  - **Early market** Systems must be capable of being quickly turned up to meet demand or turned off without a huge investment
  - **Tornado** Systems must scale & be flexible enough to handle significant volume. Market leader can set price. *Many operators stumble at this point*
  - **Main street** Volumes and revenue significant - need zero-touch, ultra low cost operations to maintain margins in commodity market.
Not Just Saving Money – But Making Money!

Immediate:
- Plug revenue leakages
- Plug fraud leakages

Short-term:
- Reduce opex through improved
  - asset management
- Drive more new services, with reduced time to revenue
- Reduce opex through highly automated processes

Medium term:
- Reduce churn through improved customer service
- Improve ‘wallet share’ through better targeting
- Drive more new services, with reduced time to revenue
- Reduce opex through highly automated processes

Tactical

Strategic = ultra low cost base

Immediate:
- Plug revenue leakages
- Plug fraud leakages

The Death Spiral of Cutting Costs!

Declining profitability

Across the board opex and capex cuts

Market share declines

Customer service and quality declines

The Path to Profits!
NGOSS: Becoming a Lean Operator by Reducing the ‘Interoperability Tax’
Today’s Back-office Model

- **High manpower costs** because of a lack of automated process flow-through
- **Poor time-to-revenue** because of rigid and inflexible business processes
- **Weak customer service** because of poorly integrated systems with inaccurate data
- **Slow growth** because processes and systems can’t scale
- **Slow new service introduction** because of inflexible systems with high costs to make changes
- **Poor economies of scale** because of fragmented acquisitions and too many suppliers.

*No one owns the end-to-end process of delivering service Organized around internal fiefdoms - not the customer.*
Today, Around 50% of all OSS/BSS Spending is Not Productive

Around 12% CapEx or around 4% of revenues is spent on OSS/BSS

But up to 50% is spent on integrating dissimilar systems

That ‘integration tax’ could be slashed if operators bought against common standards.
NGOSS Lean Operator: Vision & Goals

➢ Transform the business to deliver sustainable quality, customer service and revenues through:
  ➢ Ultra low cost operations
    ➢ High levels of automation and integration
    ➢ Information integrity
    ➢ Customer self management
    ➢ Low cost of change
    ➢ Commercially available, off-the-shelf, solutions
  ➢ Highly flexible infrastructure
    ➢ Service development at Internet speed
    ➢ Fast time-to-revenue
    ➢ Rapid response to business changes and competition
    ➢ Real-time flow-through service delivery
    ➢ SLA guarantees.
NGOSS - New Generation Operations Systems and Software

- Industry-agreed, business and systems framework to guide the implementation of improved business behaviour (processes and policies):
  - Defines methodologies for evolving OSS and BSS infrastructure into a lean operations approach
  - Specifies the key characteristics of OSS/BSS that allow high degrees of process integration and automation
  - Developed by major operators and suppliers worldwide
  - Driven and managed by TM Forum
  - Implemented as a set of best practices captured as information models.
Hitchhiker’s Guide to NGOSS

- Lifecycle and Methodology
  - Supports multiple views on stakeholder concerns
  - Process and activity driven - captured as Use Cases
  - Iterative with Feedback
- Architecture
  - Technology-neutral framework
  - Technology-specific implementations defined
- Framework
  - Combination of policy and process management
  - Shared information and data models
  - Federation through information models
- Interoperability
  - Contract- and component-based
- Communication
  - Distributed networking and computing services
- Compliance
  - Testable and provable.
NGOSS Key Concepts

- **Views** - “focus on particular concerns within a system”
- **Framework** - “supporting or enclosing structure”
- **Lifecycle** - “traceability and consistency between all phases”
- **Methodology** - “system of principles and procedures applied to a discipline”
- **Architecture** - “style or method of design and construction.”
NGOSS Pedigree (Where Did It Come From?)

- Bellcore (now Telcordia) NGS, OSCA, XIS and INA Architectures
- ANSA Project
- TINA-C Architecture
- ISO and ITU-T RM-ODP
- TMForum TMN
- TMForum TOM
- OMG MDA and UML
- HP INA DPE and Extensions
- HP ISM
- DMTF DEN
- DEN-ng
- EU FORM Project.
Who are the Lead Players in NGOSS Development?
NGOSS Lean Operator: Strategy

- Goal, Context, Capabilities and Constraints
- A Blueprint for change
  - Understand the current behaviors
  - Communicate the desired behaviors
  - Actionable plan to implement the necessary changes
  - Continuous monitoring and management to maintain desired course

- Policies and Processes drive behavior.
Maturing of Problem Solving & Solution Creation

Separation of Concerns

Business Systems

Use Case

Process

Policy

Contract

NGOSS Method

Business Process

Business Rules

Functions

Data

Business Process

Business Rules

Functions

Data

Legacy

SOA

NGOSS

Architectural Style

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A View on a Business Challenge

Business requires fluid adaptability at all levels:
- **Process and Policy**: rules are “applied” to govern the expected behavior (both at people and systems level) to achieve the desired outcome - reach the goal!
- **People**: effective collaboration, decision making and accountability throughout the solution lifecycle: business - system - implementation - deployment
- **Technologies**: require technology neutral architecture framework capable of integrating and being implemented by any technologies.
Beyond SoA: NGOSS System Architecture ...

NGOSS Use Case

- Problem Statement - Use Case
- Solution Statement - Contract

Methodology to link and maintain traceability of stakeholder accountability and full satisfaction of concerns

Requires cultural changes in solution development process
- Holistic development governed by the defined framework
- Highly iterative
- Inclusive of all stakeholders.
NGOSS Framework Examples

**Logical Information Framework**

- Holistic information architecture
- Focus on information not data architecture
- Enable stakeholders (business, architects, developers, operations) to focus on specific solutions but with a holistic view of the overall solution interactions.

**Process Framework**

**Definition- Resource Management and Operations:** This horizontal functional process grouping maintains knowledge of the resources within scope ......

Do we have a quick answer of who is responsible for this? What is the KPI for service XYZ in this area?

**Definition- Resource Configure & Activate:** responsible for configuring and activating the resources reserved for supporting a specific service instance ......

Do we have a quick answer of who is responsible for this? Which system is used for configure/activate service XYZ using technology ABC?
NGOSS Lifecycle and Methodology

Address all Stakeholder Views

No big bang project, must use tools to make knowledge visible and manageable through each solution project iteration.

- Business Scope, Goals, Missions
  - Business Process
  - Business Policies
  - Business View Info Model
  - Business Contract

- Design Standards & Process
  - System Architecture
  - Policy Model
  - Information Model
  - System Contract

- Operational Environment
  - Component Instance
  - Policy Instance
  - Data Instance
  - Contract Instance

- Implementation Choices
  - Components
  - Policy Spec.
  - Data Model
  - Contract Implementation

Knowledge Base
Repository of Reusable Best Practices – process, policy, capabilities, etc.
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NGOSS Lifecycle and Methodology

Joel Fleck, Hewlett-Packard
NGOSS Steering Council
NGOSS Architecture Board
NGOSS Lifecycle and Methodology Team
NGOSS Contract Working Group
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➤ NGOSS Lifecycle and Methodology

➤ NGOSS eTOM: Business Processes

➤ NGOSS SID: Shared Information Data Model

➤ NGOSS TNA: Technology Neutral Architecture

➤ NGOSS: Documents & Specifications
Why an NGOSS Lifecycle?

➢ To ensure that roles, requirements, models, implementations and deployments all contribute in a holistic manner to the solution

➢ To provide visibility and traceability of stakeholder responsibility and accountability throughout the lifetime of an NGOSS Solution

➢ To provide a documented means of extending and enhancing the NGOSS Knowledge Base.
Why an NGOSS Methodology?

➢ To provide a consistent, documented manner for analyzing, modeling, defining, developing, integrating, deploying and supporting NGOSS BSS/OSS Solutions.
Goals of the NGOSS Lifecycle & Methodology

Develop an NGOSS Lifecycle and Methodology that:

- Utilizes/borrows the best parts/strengths of Zachman, RM-ODP, MDA, and USDP
- Promotes and strongly encourages linkage between NGOSS eTOM, NGOSS SID, and NGOSS Architecture
- Emphasizes “consumer” - “provider” relationship for each level of decomposition
- Facilitates the identification of “testing” points that can be used to test/monitor/manage the health of both NGOSS solutions under development and deployed NGOSS solutions.
What Should an NGOSS Methodology Include?

- A formalized specification of the Business Model/Solution
- Linkages from the Business Model/Solution to the technical/realization models (i.e. Architectural Traceability):
  - Traceability from the business model/solution through each level of decomposition & refinement (vertical traceability)
  - Traceability from the process model to the data model to the policy model at each level (horizontal traceability)
- Documented steps and guidelines for developing an NGOSS Solution using the NGOSS Methodology
- Capability of being mapped onto major Architectural Frameworks
- Use Case driven
- Iterative.
What Are We Borrowing?

- Zachman
  - Emphasis on Enterprise and Business Model
- MDA
  - Meta-Models
  - Business (CIM) - Technology Neutral (PIM) - Technology Specific (PSM) Separation of Concerns
  - Ability to use a model to specify architectural artifacts (as the model changes, code is updated to reflect those changes)
- RM-ODP
  - Viewpoints (particularly Computational, Engineering and Technology)
  - Strong support for modeling distributed architectures
- USDP
  - Use Case Driven
  - Iterative Approach.

CIM - Computationally Independent Model
PIM - Platform Independent Model
PSM - Platform Specific Model
Process and Policy Definitions

- **NGOSS Process** - Defines a flow of linked activities through a solution scenario

- **NGOSS Policy** - Defines a set of rules that can be used to manage and control the behavior of the activities and govern their expected outcome

- Policies govern which Processes to use to access, monitor, and/or implement changes to a Managed Entity. The outcome of these Processes drive the working set of Policies that govern the system behavior.
NGOSS Lifecycle Views

Logical View

Physical View
NGOSS Lifecycle Views

Logical View

Physical View

Service Providers View

Service Developers View
NGOSS Lifecycle Knowledge Base

Knowledge Base

Corporate Knowledge Base

Shared

eTOM

NGOSS Knowledge Base

SID

TNA
NGOSS Lifecycle

Logical View

Business
- Business Capabilities, Constraints & Context

System
- System Capabilities, Constraints & Context

Knowledge Base
- Corporate Knowledge Base
- NGOSS Knowledge Base

Physical View

Deployment
- Deployment Capabilities, Constraints & Context

Implementation
- Implementation Capabilities, Constraints & Context

Service Providers View

Service Developers View
NGOSS SANRR Methodology

1. **SCOPE**: Define Solution Boundary including Solution Mission, Goals, and High-Level *Use Cases*

2. **ANALYZE**: Document existing (legacy) and desired environments with detailed *Use Cases, Process Maps, Activities* and *Policy Lists*

3. **NORMALIZE**: Map current view onto common vocabulary to achieve a “single unified model” (using *SID*)

4. **RATIONALIZE**: Examine normalized model for needed changes (Gap Analysis, Replication Analysis, Conflict Analysis). Terminate when no more changes are needed.

5. **RECTIFY**: Modify, delete or add capabilities (*Contractually Specified*) to resolve needed changes identified in Step 4. Once complete, cycle to Step 3.
NGOSS SANRR Methodology

Scope

Analyze
(Document Existing and Desired Problems)

Normalize
Rationalize
Rectify

Deployed NGOSS Environment

Iterate with SANRR
NGOSS Lifecycle with Iteration Using NGOSS SANNR Methodology

Logical View:
- Business: Business Capabilities, Constraints & Context
- System: System Capabilities, Constraints & Context
- Deployment: Deployment Capabilities, Constraints & Context
- Implementation: Implementation Capabilities, Constraints & Context

Physical View:
- Service Providers View
- Service Developers View

Knowledge Base:
- Corporate Knowledge Base
- NGOSS Knowledge Base

Iterate with SANNR

NGOSS KNowledge Base

Shared

Page 40
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Roles in NGOSS Lifecycle

Create Solution High Level Use Case

Business Solution Definition Use Case

- Solution Manager (1)
  - Subscriber (2)
  - Market Analyst (2)
  - Account Manager (2)
  - Customer (3)

Roles

Supporting Use Cases

System Solution Design Specification Use Case

- Solution Designer (1)
  - Information Modeler (1)
  - System Architect (1)
  - Service Architect (1)

Roles

Supporting Use Cases

Solution Implementation Use Case

- Solution Integrator (1)
  - Service Component Builder (1)
  - Service Implementer (1)
  - Data Modeler (1)
  - Network Administrator (1)
  - Information Modeler (2)
  - System Architect (2)
  - Service Architect (2)

Roles

Supporting Use Cases

Notes:
- **Bold Italic** Roles indicate accountability
- Following numbers (n) indicate Primary, Secondary or Tertiary Actors
- Interactions between Accountability Roles for each View follow indicated doubled headed black arrows
- Use Cases that span one or more Views are constructed as a coordinating Use Case that orchestrates the use of non-spanning Use Cases

Deployment

- Service Delivery Manager (1)
  - Subscriber (1)
  - System Manager (1)
  - Service Operator (1)
  - Network Operator (1)
  - Data Modeler (2)

Roles

Supporting Use Cases

System

Notes:
- **Bold Italic** Roles indicate accountability
- Following numbers (n) indicate Primary, Secondary or Tertiary Actors
- Interactions between Accountability Roles for each View follow indicated doubled headed black arrows
- Use Cases that span one or more Views are constructed as a coordinating Use Case that orchestrates the use of non-spanning Use Cases

Deployment

- Service Delivery Manager (1)
  - Subscriber (1)
  - System Manager (1)
  - Service Operator (1)
  - Network Operator (1)
  - Data Modeler (2)
Use Cases in the NGOSS Lifecycle

Business

System

Deployment

Implementation
Use Cases in the NGOSS Lifecycle

NGOSS Lifecycle High Level Use Case
Use Cases in the NGOSS Lifecycle

- Business
  - Service Provider
    - High Level Use Case
  - Service Developer
    - High Level Use Case
- System
  - Deployment
  - Implementation
Use Cases in the NGOSS Lifecycle

Logical Plane
High Level
Use Case

Physical Plane
High Level
Use Case

Business

System

Deployment

Implementation
Use Cases in the NGOSS Lifecycle

Quadrant Sub Use Cases

Deployment

System

Business
NGOSS Lifecycle

**Business**
- Tailored Business Processes
- Tailored Business Policies
- Business Scope, Goals, & Mission
- Business Definition Process
- Business Definition Process
- Business View
- Info Model

**System**
- System Processes
- System Design Standards & Procs.
- System Processes
- Policy Model
- Policy Model
- System Contracts

**Deployment**
- Run-Time Process
- Process Instances
- Data Instances
- Contract Instances
- Policy Instances
- Deployment Environment
- Implementation Environment

**Implementation**
- Implementation Process
- Implementation Process
- Policy Specs
- Data Model
Conclusions

➢ Artifacts are used to capture and communicate the desired interactions between entities
➢ Organized using the Lifecycle Views to provide for Better OSS Knowledge Management & Reuse
➢ Better OSS Knowledge Management improves Information Communication, leading to reduced Integration Tax and increased Interoperability and Automation.
NGOSS eTOM Overview

Nick Webb, QinetiQ
Senior Engineer – Management Systems and Requirements

NGOSS eTOM Team
Agenda

- NGOSS Background & Basics
- NGOSS Lifecycle and Methodology
- NGOSS eTOM: Business Processes
- NGOSS SID: Shared Information Data Model
- NGOSS TNA: Technology Neutral Architecture
- NGOSS: Documents & Specifications
eTOM: Linkage to NGOSS

- The eTOM provides the process oriented view on the Business Concerns.
- The eTOM process and activity descriptions are used to create business flows that diagram what needs to happen when and by whom.
- Business View Use Cases drive the Business Contracts.
- Feedback from the NGOSS development cycle is used to validate the eTOM best practices.
TOM horizontals correspond to TMN Layers

TOM processes are captured in “FAB” area of eTOM Operations

eTOM maps the NGOSS Business View
eTOM - Business Map

- The eTOM is an organized collection of industry best practices
  - Business View on Concerns expressed as Process and Activity descriptions and sample Flows
- Used for Identifying and Cataloging:
  - Domain Boundaries
  - Business Processes and Flows
  - Use Cases
    - Actors, Entities, Models
    - Contracts.
eTOM: the Big Picture

Customer

Strategy, Infrastructure & Product
- Strategy & Commit
- Infrastructure Lifecycle Management
- Product Lifecycle Management
- Marketing & Offer Management
- Service Development & Management
- Resource Development and Management (Application, Computing and Network)
- Supply Chain Development and Management

Enterprise Management
- Strategic & Enterprise Planning
- Financial & Asset Management
- Brand Management, Market Research & Advertising
- Human Resources Management
- Stakeholder & External Relations Management
- Research & Development, Technology Acquisition
- Disaster Recovery, Security & Fraud Management
- Enterprise Quality Mgmt., Process & IT Planning & Architecture

Operations
- Fulfillment
- Assurance
- Billing
- Operations Support and Readiness
- Customer Relationship Management
- Service Management & Operations
- Resource Management & Operations (Application, Computing and Network)
- Supplier/Partner Relationship Management
eTOM - The Level 2 Processes

Customer

Operations

Strategy, Infrastructure & Product

Service Development & Management

Resource Development & Management

Supply Chain Development & Management

Enterprise Management

Financial & Asset Management

Stakeholder & External Relations Management

Human Resources Management

Disaster Recovery, Security & Fraud Management

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Process Decompositions

Level 2

Order Handling

Level 3

Preorder Feasibility Determination

Receive Pre-Order Feasibility Request

Issue Pre-Order Feasibility Study

Credit Authorization

Credit Investigation Determination

Credit Investigation

Obtain Appropriate Approvals

Advise and Negotiate Acceptable Terms

Order Issuance

Order Request Validation

Order Plan Development

Order Creation

Order Amendment

Order Cancellation

Order Tracking and Status

Status Establishment and Management

Status Report

Customer Jeopardy Notification

Committed Date Re-negotiation w/ Customer

Order Completion

Manage Customer changes to Agreement Con

Test solution and demonstrate to cust

Confirm Order Completion with Customer

Train the customer

Validate info for Assurance and Billing

Report unmet commitments or capabilities

Level 4

Customer Satisfaction Validation

Confirm Customer Value delivery

Billing Satisfaction Validation

Followup on optimal Customer Utilisation

Customer Satisfaction Validation

Confirm Customer Value delivery

Billing Satisfaction Validation

Followup on optimal Customer Utilisation

Level 4
Example Ordering (Fulfillment) Flow

Customer Relationship Management
- Customer Request received
- Customer Order confirmed
- Retention & Loyalty
  - Priority Requested
  - Priority Advised
  - Customer Order Initiated

Service Management & Operations
- Selling
  - Customer requests SP offering
- Service Configuration & Activation
  - Design Requested
  - Design Completed
  - Service Status
  - Service Update
  - Service Activated

Resource Management & Operations
- Resource Provisioning & Allocation to Service Instance
  - Capacity Requested
  - Capacity Reserved
  - Work Order Initiated
  - Resource Provisioning Requested
  - Resource Activation
  - Resource Activated

Supplier/Partner Relationship Management
- S/P Buying
  - External Component Requested
- S/P Purchase Order Management

Billing & Collections Management
- Service Details for Billing
- Service Details for Assurance
- Customer GoS/SLA Management
- External Order Issued
Where Next?

- eTOM continues to prioritize business scenarios to guide the ongoing work
- Lower-level process decompositions are developed for the selected process areas
- Process flows to map the processes into the business scenarios are defined
- eTOM is driving the process-oriented Business View in NGOSS and linked with other elements, e.g. the SID.
NGOSS SID Overview

Cliff C. Faurer, TM Forum
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Why have an Information Model?

- Provides a way of visualizing information
- Provides a consistent and common terminology
- Provides visibility of information interaction
- Allows reuse of IT investment

... leading to business benefits of improved
- Cost
- Quality
- Timeliness
- Adaptability
- Interoperability!
What IS the SID?

“A Holistic De-compositional Information Model defined in UML covering each View of the NGOSS Lifecycle”
Information to Answer the Six Primitive Questions

- What?
- Where?
- Why?
- How?
- When?
- Who?
Contexts and Roles

- How do we model something where the characteristics of interest change depending on the situation?
- We need to separate the *intrinsic* attributes from the *contextual* attributes
- SID Role Pattern.
States and Lifecycle

- How do we model the invariant and varying characteristics of a concept or thing?
  - Put the invariants in a Specification
  - And the varying into the Entity
- Entity - Entity Specification Pattern
  - Separate out those characteristics that need to have their changes tracked (past/present/future).
The real world is a connected place
Concepts rarely exist in isolation

So -
We need to model how things relate

Captured in UML as associations, aggregations and compositions.
### Shared Information & Data Model

#### Market / Sales
- Market Strategy & Plan
- Marketing Campaign
- Contact/Lead/Prospect
- Market Segment
- Competitor
- Sales Statistic
- Sales Channel

#### Product
- Product
- Strategic Product Portfolio Plan
- Product Performance
- Product Specification
- Product Offering
- Product Usage Statistic

#### Customer
- Customer
- Customer Order
- Customer Problem
- Customer Interaction
- Customer Statistic
- Customer SLA
- Applied Customer Billing Rate
- Customer Bill Collection
- Customer Bill
- Customer Bill Inquiry

#### Service
- Service
- Service Applications
- Service Performance
- Service Specification
- Service Configuration
- Service Usage
- Service Trouble
- Service Test

#### Resource
- Resource
- Resource Topology
- Resource Performance
- Resource Specification
- Resource Configuration
- Resource Usage
- Resource Trouble
- Resource Test

#### Supplier / Partner
- Supplier/Partner
- S/P Interaction
- S/P Order
- S/P Plan
- S/P Product
- S/P SLA
- S/P Performance
- S/P Problem
- S/P Bill
- S/P Bill Inquiry
- S/P Statistic
- S/P Payment

#### Enterprise
- (Under Construction)

#### Common Business
- Party
- Business Interaction
- Location
- Policy
- Agreement

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Example: Order Handling Business Use Case

OrderHandling

Customer Interface

Customer

Richard

Sales

Pre-Order Processing

«include»

Validate Order

Request

Analyze Order

Feasibility

Process Order

Order

Authorize

Credit

Issue

Order

Track Order

Manage Jeopardy

Complete Order

Amend Order

Cancel Order

Receive Order Request

Validate Order Request

Analyze Order Feasibility

Order Processing

Issue Order

NOC

Internal Engineering

Supplier Partner

Customer Interface

Pre-Order Processing

Order Handling

«include»

«include»

«include»

«include»

«include»

«include»

«include»

«include»

Courtesy PEA and mdapce
NGOSS SID – Product-Service-Resource
Example: Partial Contract Hierarchy for Upsell

View of the data from Market, Sales and Order points-of-view

May require new device to use enhanced features

Customer Contract

Product Contract

PhysicalResource Contract

CustomerFacingService Contract

ResourceFacingService Contract

ResourceFacingService Contract

CustomerFacingService Contract

Traffic Identification

Traffic Conditioning

Import Policies

Export Policies

Translated into ProductSpecs, ProductOfferings, and Products

Gold Service

Route Forwarding

VoIP

VPN

Device OS

Traffic Identification

Traffic Conditioning

Import Policies

Export Policies
SID and the Industry

SID is a federation of models, not “home-grown”
- Material mined from company contributions as well as DEN-ng, ITU, IETF and DMTF

SID is already being used by
- Vendors (e.g. MetaSolv and Intelliden)
- Service Providers (e.g. BT, Telstra, Bell Canada)
- TM Forum Catalyst Projects
- OSS/J Core Business Entity Model

SID is being considered for use in
- T1M1 Global Telecom Data Dictionary (GTDD)
- OMG Telecom Domain Task Force (DTF)
- ITU Study Group 4.
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NGOSS Architecture Overview
NGOSS Documents and Specifications

Giuseppe Covino, Telecom Italia Labs
NGOSS Architecture Board
NGOSS Contract Working Group
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NGOSS Architecture

➤ Logical Architecture:
  ➤ Business View Architecture (Requirements and Specification)
  ➤ System View Architecture (Technology Neutral Design)

➤ Physical Architecture:
  ➤ Implementation View Architecture (Technology Specific)
  ➤ Deployment View Architecture (Management and Operations).
NGOSS TNA Concepts

- All (externally visible) Interfaces are defined through Contracts
- All Contracts are registered and locatable via NGOSS framework services
- An NGOSS implementation will be over a (logical) common communications infrastructure.
NGOSS Architecture Concepts

- Component
  - Contains 1 or more
  - Instantiated by 2 or more
  - Contains 2 or more
NGOSS Architecture Component Model

A Component is:
- An implementation of functionality
- Subject to 3rd party composition
- Unit of manageability
- Contractually specified
  - i.e. containers for contract instances
- For high availability environments ...
  - A component instance may not have persistent state.
NGOSS Architecture Service Concepts

A Service is:

- A collection of functional capability described by one or more contracts
- Unit of manageability
- Capability described as contractually specified interactions
- Accessible through the contract instances.
NGOSS Architecture Contract

A Contract is:

- Description of functionality to be provided
  - Metadata used to describe the interface
  - Metadata used to describe the operations that may be invoked on the Service
  - For each operation, the set of terminations that may be returned by the Service after invocation of the operation

- Behavior of the functionality, some of the behavior that may be specified include
  - Pre-conditions under which an operation may be invoked (i.e. the set of conditions that must be satisfied in order to invoke the operation)
  - Post-conditions, which define the state that the system is left in for each termination that can be returned when an operation is invoked.
Decomposition of NGOSS Component

Component

contains one or more

management is defined by

Service

functionality is defined by one or more

Component Mgmt. Contract

is implemented by

Component Mgmt. Contract Instance

Service Mgmt. Contract

is implemented by

Service Mgmt. Contract Instance

Service Functional Contract

is implemented by

Service Func. Contract Instance
‘Morph’ the Contract

1. Define the Business
   (Leadership Team, Business Process Engineers)
   - Business Contract

2. Architect the Business
   (Enterprise IT Architects)
   - Business Contract
   - System Contract

3. Implement the Business
   (Development Org.)
   - Deployment Contract
   - Implement Contract
   - Business Contract
   - System Contract
   - Implement Contract

4. Execute the Business
   (Operations)
Relationship of NGOSS Artifacts

NGOSS Policies

NGOSS Contracts

NGOSS Activities

NGOSS Process Descriptions

NGOSS Use Cases

Market / Sales

Product

Supplier / Partner

Enterprise

Contract / Process Entities

Training Plus

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Distribution and Transparency Services Model

- Derived Repository
- Repository
- Federated Foreign Repository
- Naming Services
- Contract Instance Location Services
- Registration Services
- Other NGOSS Supporting Services (e.g., Logging, Transaction)
- Users
- Specifiers, Designers/Devel., & Admin.
Contract Instance Location Services

- A Framework Service that facilitates decoupling the “hard binding” of clients and servers by providing a dynamic “matchmaking” service during the runtime phase of the software lifecycle

- To facilitate support for:
  - Contract Instance relocation (Contract Instance moved to new platform)
  - Contract Instance mobility (Platform moves)
  - Addition/deletion of duplicate Instances of Contract (for added reliability or performance)
  - Addition of new or value-added Contract Instance

- In a manner that is transparent to clients of the Contract Instances.
Types of Contract Instance Location Services

- **Pull:** Contract Instance Location whereby requests for service from potential clients are matched with previously registered Contract Instance offers. Binding information is returned immediately upon match.

- **Push:** Contract Instance Location whereby requests for service from potential clients are accepted and queued. Binding information about the Contract Instance provider is returned to the potential client when the potential provider becomes available.

- **Auctioning:** Contract Instance Location whereby the potential client asks for selection of a desired service based on an auction between potential providers. Binding information is returned at either when client criteria is met or auction time expires.
NGOSS Federation Model

- Service Level Federation: Pair-wise between two Services
  - NOT encouraged! Issues with scaling, performance (feature interaction problem!), and “private data model agreements”

- Repository Level Federation:
  - Recommended MOST STRONGLY!!
  - Requires use of common information model (or those for which well defined mappings exist)
  - Transparent to all other service (Framework or Applications).
Highlights of NGOSS Federated and Derived Repository Models

- **Derived Repositories:**
  - Cache Repository defined to add performance
  - Union Repository defined to facilitate manageability, usability and scalability at enterprise level

- **Federated Repositories:**
  - Defined to add scalability and inter-working between Domains and Enterprises
  - Federation at peer level only (i.e. Cache to Cache, Union to Union, or Master to Master)
  - Defined at a number of levels:
    - Intra-domain (Cache to Cache)
    - Inter-domain, Intra-Enterprise (Cache to Cache or Master to Master)
    - Inter-Enterprise (Cache to Cache, Master to Master or Union to Union).
NGOSS Federated Repository Model

Enterprise a

- Domain 1
  - Domain 2
  - Domain 3

Enterprise b

- Domain 4
  - Domain 5

Relations:
- $f(A.2, C.1)$
- $U_{ABC}$
- $U_{DE}$
- $f(C.1, D.1)$
Agenda

➤ NGOSS Background & Basics

➤ NGOSS Lifecycle and Methodology

➤ NGOSS eTOM: Business Processes

➤ NGOSS SID: Shared Information Data Model

➤ NGOSS TNA: Technology Neutral Architecture

➤ NGOSS: Documents & Specifications
Applications of NGOSS

- Service Providers
  - Assess Business Process & System Capabilities
  - RFP
- System Integrators
  - Assess Market Opportunities
- Independent Software Vendors
  - Framework for Contract/Component Development
- Network Equipment Providers
  - Framework for Contract-based Device Management Interfaces
- Other Consortia/Standards Bodies
  - Fast-tracked as both foundation and extensions to number of major standards bodies (both telecommunications and external)
- TM Forum
  - Business/System Analysis & Design (WSMT, ...)
  - Experimentation & Co-operative Development (Catalyst Projects).
NGOSS Documentation Roadmap

**NGOSS Base Set**
- TMF 050 – Compliance Suite
- TMF 053 – Technology Neutral Architecture
- GB921 – eTOM
- GB922 – SID Business View
- GB926 – SID System View
- GB927 – Lifecycle and Methodology

**Process Desc. Suite**
- GB921B – eTOM B2B Integration
- GB921C – Business Operations Map
- GB921D – Process Decomposition & Description
- GB921F – Process Flow Examples
- GB921L – Using eTOM to model ITIL
- GB921S – SIP Level 3 Decomposition & Description

**Info. Modeling Suite**
- GB922 0 – SID Primer
- GB922 1A – Business Entity Defs. – Agreement
- GB922 1BI – Bus. Entity Defs. – Business Interaction
- GB922 1BT – Bus. Entity Defs. – Base Types
- GB922 1L – Bus. Entity Defs. – Location
- GB922 1P – Bus. Entity Defs. – Party
- GB922 1POL – Bus. Entity Defs. – Policy
- GB922 1R – Root Business Entity Definitions
- GB922 1T – Bus. Entity Defs. – Time
- GB922 1U – Using the SID
- GB922 2 – Bus. Entity Defs. – Customer
- GB922 3 – Bus. Entity Defs. – Product
- GB922 4S – Bus. Entity Defs. – Quality of Service
- GB922 4SO – Bus. Entity Defs. – Service
- GB922 5LR – Bus. Entity Defs. – Logical Resource

**TNA Suite**
- TMF 053B – Contract Specification
- TMF 053C – Behavior and Control
- TMF 053D – MetaModel
- TMF 053F – Distribution and Framework Services
- TMF 053S – Security Principles

**Compliance Suite**
- TMF 050A – Testing Rules
# NGOSS Lifecycle & SFT Documents

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## NGOSS Architecture and Compliance Documents

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Thanks for Listening!

Questions?
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Training Plus: education@tmforum.org
Next Steps

➤ Training Plus at TeleManagement World, Nice, France, 16-19 May, 2005:
  ➤ http://www.tmforum.org/browse.asp?catID=2194

➤ TeleManagement Regional Summit, Bangalore, India, 5-6 December, 2004:
  ➤ http://www.tmforum.org/browse.asp?catID=1118&linkID=29688

➤ TM Forum “We Come to You” courses:
  ➤ http://www.tmforum.org/browse.asp?catID=1565

➤ TM Forum Webinar series:
  ➤ http://www.tmforum.org/browse.asp?catID=2065

➤ All About NGOSS:
  http://www.tmforum.org/browse.asp?catID=1639