Using open source to realise an NGOSS Proof of concept

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OpenOSS

- University backed industrial research
- Working with the Telemanagement Forum
- Action Research (i.e. participate in projects)
- Investigate the benefits of NGOSS specified solutions
- Investigate the implications of open source realisations
  — Proofs of concept

NGOSS – tmforum.org
Research Approach

• **Action Research**
  — Contribute to industry knowledge on how to use these technologies
  — Quantify the business benefits they offer
  — Contribute back from our experiences into the evolution of the standards
  — Promote tools or methodologies for practically working with NGOSS and related technologies

• **Open Source**
  — Leverage the work of other groups
  — Contribute work back – such that it can be built upon and not lost
Telemanagement World May 2005
OpenOSS Catalyst

- VoIP scenario
  - SER
  - NISTNET
- SIP Monitoring
  - Agilent NgNAS
- Unified console
  - Jboss Portlet server
- Trouble Ticketing
  - OTRS
- Alarm Corellation
  - DROOLS
- SNMP monitoring
  - OpenNMS
- Simplified OSS/J interfaces
Using A Testbed in the Design Process

• How do we use NGOSS to design real solutions?
  — NGOSS lifecycle
  — MDA tooling with NGOSS Models

• Model Driven Architecture
• Round Trip Engineering

NGOSS and OpenOSS in Design Process

NGOSS Cycle 1 – Create a proof of concept to test out basic assumptions and design process
• Is NGOSS suitable for specifying such a system
• Is it possible to model services and customer impact
• Explore alarm presentation / user interface aspects of solution
• Use proof of concept to elicit user feedback

NGOSS Cycle 2 – Create a system specification with a view to choosing component vendors
• Use NGOSS modelling as part of specification process
• Use NGOSS to consider all aspects of system lifecycle
• Use proof of concept to educate procurement process
• Work with component vendors to create an implementation view as part of Functional Requirements Specification

NGOSS Cycle 3 – Create a test specification based upon NGOSS FRS
• Use initial specification to drive test specifications for acceptance

NGOSS Cycle 4 – Create data fill for system and deployment plan based upon network rollout
• Use eTOM processes to inform planning for data fill and network migration
Modelling NGOSS Contracts

1. eTOM used to scope work around Service Assurance
2. Business processes broken down to elemental processes
3. Business Requirements set goals for process elements
4. Managed Entities from Network and Service model developed for Digital TV network

UML NGOSS Analysis performed using tooling and approach developed by Automagic KB
http://www.automagickb.com
NGOSS prototype UK Digital TV Service

• **Background**
  — Digital TV rollout begins in UK within 5 years
  — Digital TV convergence with Mobile

• **Opportunity for broadcasters**
  — Analyse the Digital TV network management problem
  — De-risking the Digital TV management strategy and procurement process
  — Leveraging emerging mainstream Telecommunications management technologies
  — Develop a solution against a strategic understanding of Telecoms/Digital TV convergence rather than architecting a solution which mirrors their current business
  — Considering business process analysis as integral to the network management design
  — Future-proof the architecture for managing next generation services

• **Opportunity for OpenOSS**
  — Add novelty to the research by extending standards originally intended for telecoms management towards the management of Digital TV.
  — Provide a realistic project which is right-sized for the research resources and which has a degree of commercial support.
Digital TV Service Assurance Problem

• **Business Problem**
  — Process
    - Broadcasters demanding stringent SLA’s
    - Operational Readiness processes need alignment with very rapid digital TV rollout plan
    - Not clear if existing process and systems can cope with future requirements
      - Limited skilled staff
      - Difficult to introduce rapid change
  — Service Assurance
    - Fault Service Impact varies hourly with program schedules
    - Main Transmitters serve large populations with limited redundancy and heavy penalties for failures
    - Complex program distribution paths
      - Satellite, Landline, Rebroadcast Chains
      - Local content insertion
    - Multiple management domains
      - Different management visibility requirements from each broadcaster
      - Shared common equipment;
        - Mast, combiner, power etc
    - Future convergence of Telecoms, with broadcasting needs considered

• **Technical Problem**
  — Limited industry agreement on network management standards.
  — No proven large scale Digital TV management solution
  — Choice of Transmitter Control protocols
    - Currently use proprietary SCADA
    - Opportunity to leverage standards
      - SNMP, WBEM, Web Services, Others?
  — No common Network and Service models for Digital TV.
    - Is it possible to leverage
      - DMTF CIM Vs NGOSS SID
      - ETSI TR 101 290 v1.2.1 Broadcast DTV measurement spec & MIB
  — Requirement for policy/ rule driven Service assurance
  — Can we exploit a rapid solution development approach using open source to prototype a solution
Digital TV Service Assurance

Key Concepts

- **Station Manager**
  - Local alarm consolidation
- **Service Impact manager**
  - National impact analysis
- **Distributed documentation server**
- **Distributed trouble management**

![Diagram showing the service assurance system with key components and user roles.](image-url)

- **Permissions Policy**
  - User, Password
  - Group (job function)
  - Time
  - Functions
  - Applications
  - Activity Log

- **Document Management System**
- **Trouble Management System**
- **Service Impact Alarm Manager**
- **NOC User Portal Desktop**
- **Service Management Users**
  - Online Documentation
  - Video Capture
- **Regional Operations User Portal Desktop**
- **Element Console**
- **Station Manager**

- **Routine Maintenance Users**
- **Digital TX A**
- **Digital TX B**
- **Automated test**
- **Environmental**

- **SNMP/other**

- **Distributed service model used for service assurance**
  - Using NGOSS/OSS/J Resource, Service and product inventory to drive business process

**University of Southampton**

*Southampton University Engineering Doctorate – 2006*
Digital TV Proof of Concept

Components

- **OpenNMS**
  - polling digital transmitter MIBS
  - Performance and fault data collection
- **Invocom Inference engine**
  - Providing network and service model
  - Leveraging ILOG Jrules or DROOLS
- **Model builder**
  - Mapping UML model into rules
- **NOTE – OSS/J and alternative interface technologies will be investigated**

Technology Neutral Design modelling leveraging UML tools

- XML Network Model built from UML (stretch objective)
- Alarms to correlator using OSS/J interface to OpenNMS
- Correlator sends new OSS/J alarms to OpenNMS

OSS/J FM

ArgoUML

Velocity

Model Builder

NGOSS Model

OpenNMS

Scanning Configuration

SNMP scanning

TV Service Network

PM Portal

OSS/J PM

Portal UI

OSS/J PM

WebUI

OSS/J PM

FM portal

OSS/J PM

OSS/J PM

OSS/J PM

OSS/J PM

Model View

Model Creation

Inference Engine UI

Invocom Inference Engine

Model

Rules

Model Builder

OSS/J FM

A

B

C

D
Summary and Conclusions

• **OpenOSS**
  — Is providing a vehicle for university research to tackle real world management problems
  — Rapid application development backed by a management model provides a means to do proof of concept investigations in a disciplined and structured process

• **The Digital TV management proof of concept**
  — Is significantly de-risking the deployment of digital TV in the UK by identifying early problems and developing the management architecture before major purchasing decisions are made.

• **Flexible approach to NGOSS**
  — By choosing to investigate real world problems, we are taking a flexible approach to NGOSS. This mirrors what will happen in any real world engineering situation.
  — Our pragmatic approach to modelling is using the bits of NGOSS which work for us and combining them with other work such as the DMTF CIM in order to deliver time to market solutions.
  — This approach makes NGOSS tractable to the Systems Integrator.
References

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