



Network and Service Assurance with OpenNMS – Lecture 2

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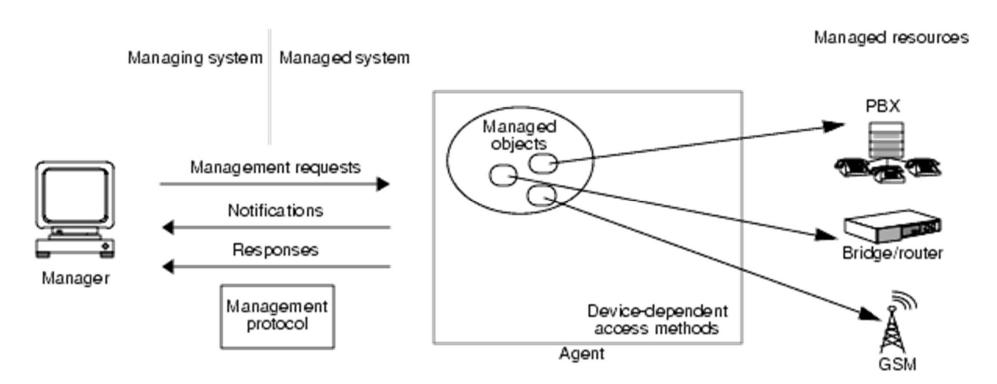
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Basic Principles of Management





- Real world elements are represented by a model which can be manipulated by a management system
- Synchronous
 - Request / response /
 - Poling or sending commands
- Asynchronous
 - Messages I have a problem

Management Standards (Telecoms)



- ITU-T
 - M30 / M3000 series of network management standards
 - Fault, Configuration Accounting, Performance, Security (FCAPS)
 - Layers
 - Business management
 - Service management
 - Network management
 - Element management
 - Q3 Interfaces Based on Common Management Information Protocol (CMIP)
 - Complex Object Orientated models
 - Written in ASN-1 Abstract Syntax Notation 1

TMForum

- Formed initially to provide simplified profiles of CMIP
- Quasi standards and Trade body for TNM

Standards

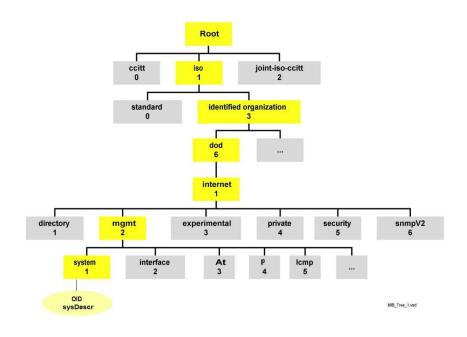
- MTNM / MTOSI
- OSS/J
- Etc...

A Short History of Network Management (Enterprise / IT)



Simple Network Management Protocol SNMP

- CMIP
 - Too complex / resources intensive and expensive to implement
 - Object Orientated but too many variations possible
- Simple Network Management Protocol
 - Written in ASN-1
 - Tables rather than Object Orientated
 - Each manufacturer could publish their own Management Information Base MIB
 - Free tools such as NetSNMP available to make use much easier



Distributed Management Task Force - DMTF

- Originally Desk Top Management Task force
- Web Based Enterprise Management XML based protocol and model
- Adopted by Microsoft as WMI
- DEN Directory Enabled Networks LDAP
 Directories for management information

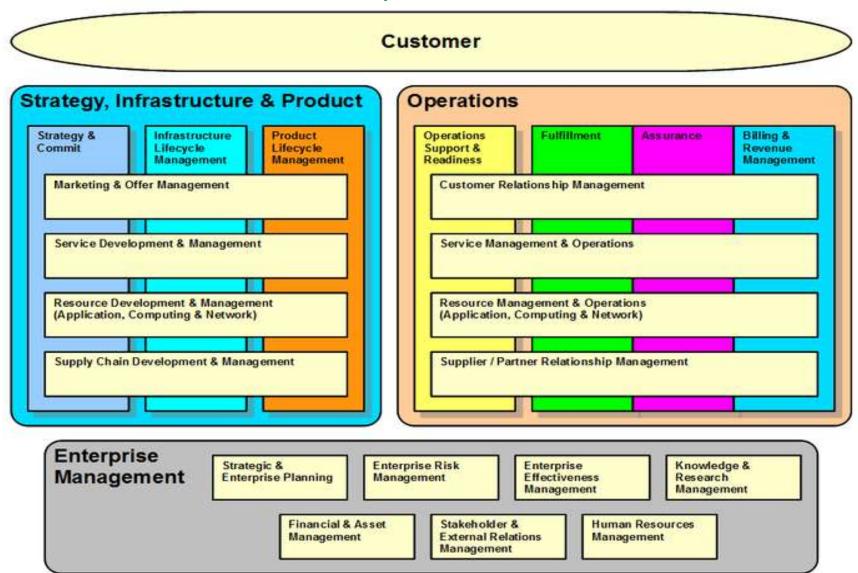
DMTF CIM Model

- CIM Comon Information Model
- DEN was modified by John Strassner and contributed as DEN-NG to TM Forum and became the SID Model (Frameworkx Information Model)

A Short History of Network Management open NMS UK



(Process Models – Telecoms eTOM)



eTOM Extended Telecoms Operations Map (Frameworkx Process Model

A Short History of Network Management (Process Models – Enterprise ITIL)



IT Infrastructure Library – UK Cabinet Office

Service Design:

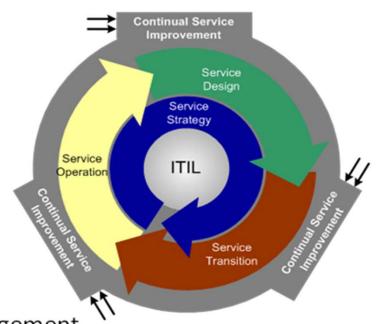
- Service Catalogue Management
- Service Level Management
- Capacity Management
- Availability Management
- IT Service Continuity Management
- Information Security Management

Service Transition:

- Service Asset and Configuration Management
- Change Management
- Release and Deployment Management

Service Operation:

- Event Management
- Incident Management
- Problem Management
- Request Fulfillment



Continual
Service
Improvement
(CSI)

The Service Management Problem



High Service Velocity

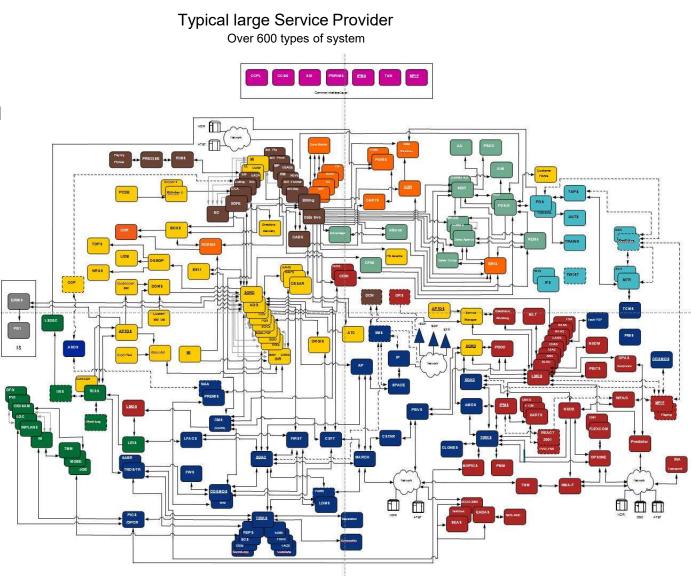
- Telecoms Service Providers cannot modify their systems fast enough to keep up with service introduction
 - Currently 18 months lead time
 - Target 1 month lead time

Massive Network Churn

- The network technology is changing faster than the service management systems can adapt
- e.g. 100 systems changed to introduce ADSL in UK

High Integration Cost

- Integration tax. OSS development and support = 3% revenues
- 62% operator revenues are directly affected by OSS effectiveness
- (Tada H et al 2003)



'Sweat The Assets'

MANUE UK

Microprocessor Transistor Counts 1971-2011 & Moore's Law

nms.co.uk

Moores law

- (Gordon Moore INTEL)
- number of transistors on integrated circuits doubles approximately every two years.

But

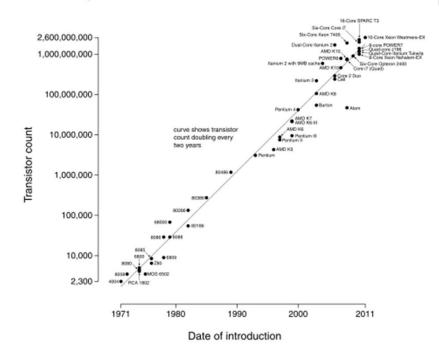
Not keeping up with demand

Finite assets

- Power consumption
- Bandwidth
- CPU
- Memory
- Storage

Largest data centres in the world

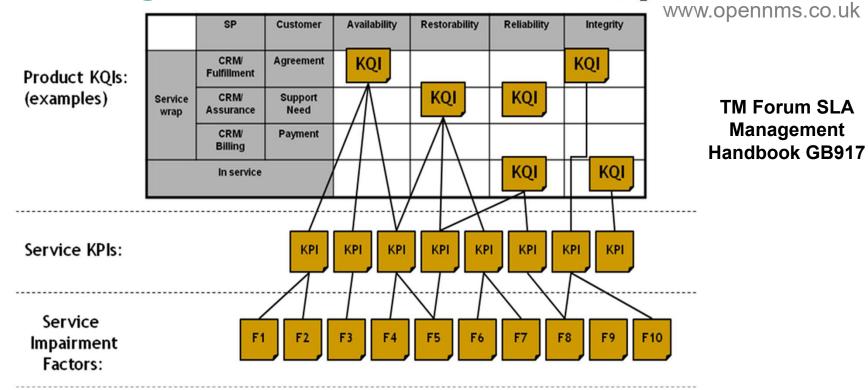
Few percent – significant cost reduction



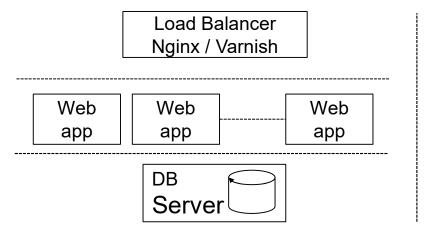


Service Level Agreement Calculation





- SLA's are very like insurance or options
- How do you know the value at risk?



Management
Configuration

Each application
type has a
unique service
architecture

Common Component's

NAT / VPN

Network

Making the NOC more like a Trading Room NMS UK

- 2 Trading Approaches (both valid but different)
 - Business Fundamentals
 - Quantitative Methods



Making The NOC

more like a trading room



Trading Room

Remember traffic management for voice services?

Fulfilment

- Strike price for SLA's based on real network risk data
- Ability to increase utilisation while actively managing risk
- Machines and bandwidth provisioned based on expected correlation between co-hosted services

Assurance

- Real time visualisation of data centre asset performance
- Increased variance shows potential instability
- Spot and move negatively impacting services

Q&A







The End ©